

## PART I

### DISEASES OF THE DIGESTIVE SYSTEM

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#### GENERAL DISCUSSION

The adequate treatment of diseases of the digestive system rests upon a knowledge of the function, circulation and innervation of this long tube which traverses the body.

For convenience, this alimentary tube may be divided into three chief groups which differ from each other in many respects. First, the mouth with the salivary glands, the pharynx, and the esophagus; Second, the stomach, small intestine, liver and pancreas; Third, the colon, sigmoid and rectum.

In the first group we have the mouth, salivary glands, pharynx and esophagus. All of these tissues are well supplied with arterial blood and have very free venous and lymph drainage. The blood vessels are innervated by vasomotor nerves from the cranial and upper cervical sympathetic ganglia, which receive their stimulation from the centers in the medulla, chiefly by way of the seventh cranial nerves; and from the first to the fourth thoracic spinal segments by way of the gray rami and the sympathetic chain. These nerve centers are somewhat affected by impulses from the emotional centers, but their chief control is through sensory nerves of the same and neighboring segments. Bony lesions of the mandible, hyoid, occiput, atlas, axis, other cervical vertebræ, the first and second ribs and the clavicle are efficient causes for disturbed function of the nerve centers which control the secretion, circulation and nutrition of the mouth, tonsils, salivary glands and pharynx and esophagus. Such lesions lower resistance to infection, increase and perpetuate the effects of traumatic or toxic influences and hinder recovery in practically all forms of diseases of the organs mentioned. The food remains in the mouth, pharynx and esophagus so short a time that only very marked or constant dietetic errors cause injury.

In the second group—the stomach and small intestine, the liver and the pancreas—is found a set of organs which also has a double innervation. The vagus carries motor and secretory impulses to these organs by way of the solar plexus. Probably some vasomotor fibers derived from the lateral chain of sympathetic ganglia may be carried by way of the vagus. Certainly the splanchnic nerves which are derived from the sixth to the twelfth thoracic segments carry nerve fibers which are distributed in a somewhat segmental manner to this part of the digestive tube.

All of these organs receive sensory innervation, both by the splanchnic and the vagus nerves. Bony lesions of the occiput, atlas and axis are responsible for certain functional gastric disturbances, and lesions of the spinal column and the ribs, especially from the fifth to the tenth thoracic, result in circulatory, secretory and trophic disturbances of the stomach, small intestine, liver and pancreas.

Variations from the normal quality and quantity of food may have marked effects upon these organs. So long does the food stay in the stomach and in the small intestine and so profoundly is the chemistry of the food modified by the digestive secretions of this part of the alimentary tract and by bacterial action that we must recognize very clearly the influence of dietetic errors in the etiology of diseases affecting these organs.

The fact that gastric activity is speedily and profoundly modified by emotional disturbances is demonstrated by such frequent experiences that probably no one has failed to appreciate it either in his own or his neighbor's life. It is also true that sudden pain, as for example from sciatica or toothache, affects the digestive activity.

When bony lesions of the occiput, upper cervical and mid-thoracic spinal column, the ribs or the mandible are present, or when there is any lack of normal mobility of the articular surfaces in these areas, the gastro-enteric centers either fail to receive their normal stimulation or they are acted upon by irritating streams of sensory impulses. The normal nerve control of the stomach is thus interfered with in much the same way as might occur if constant emotional disturbances were present. Under such circumstances even normal food may provoke an attack of gastritis or enteritis while dietetic errors, for which the normal protective mechanisms of the body should be entirely adequate, may bring about digestive disturbances out of all proportion to the apparently trivial cause.

Since many of the products of digestion are carried through the liver this organ also is subject to the adverse influences of improperly chosen or imperfectly digested foods. It is not yet shown whether the quality of the food stuffs exercises any abnormal influence over the pancreas or not.

The third group, the colon, sigmoid and rectum, has its chief innervation from the lumbar and sacral nerves. These nerve centers may be profoundly affected by sensory nerve impulses reaching them from the articular surfaces of the lumbar vertebrae, the sacrum, the innominates and the hip joints as well as from the abdominal viscera. The arterial supply of the lower part of the alimentary tract is plentiful and the anastomosis is very free. The veins are large with free anastomoses but the return flow of venous blood is liable to be impeded by slight or profound hepatic dis-



turbances and this column of blood is always subject to the adverse influence of gravitation. The structural circulatory relations predispose to the formation of hemorrhoids and diminished resistance of the rectum and its neighboring tissues.

During this part of its passage through the alimentary canal the food stuff undergoes little change. The walls are not profoundly affected by abnormalities in diet except as these result in too great or too little quantities of waste material, or as the strength of the body may be influenced from the standpoint of nutrition. The colon itself is subject to pressure from too long retention of the fecal mass and certain structural perversions, leading to its ptosis and to the effects of much ill-judged treatment for constipation.

These considerations lead to the view that the more common digestive diseases are always complex in etiology; that in dealing with any of these cases we have to take into consideration not only the habits of eating, the quality and quantity of food, the manner in which the food is prepared and served and eaten, the habitual emotional state of the patient at meal time, but also the structural relationships of the entire body.

"Formerly in many confusing conditions of the gastrointestinal tract, diagnosis could only be made by the aid of an explorative laparotomy. The need for many of these has been removed by modern Roentgenology.

"The information gained by careful study of the gastrointestinal tract when containing the 'bismuth meal' or enema, or under air or gas inflation, can often be secured in no other way. A positive diagnosis can be made of strictures or diverticulæ, the tone, motility and patency throughout the tract. The fluoroscope shows position, size, shape, capacity, motility and functioning of the stomach and its gateways, as well as the presence or absence of ulcers, with their resulting constrictions or carcinoma with its typical infiltration. Definite location of pathology can usually be obtained throughout the tract. The amount and character of the waves of peristalsis can be seen and studied as carefully as can the pupillary reflex or the radial pulse. Serial plates enable one to know the length of time that is required for different portions of the tract to empty themselves. Thus stasis from any cause, as adhesions, deformity of structure, lack of muscular tone, or ileus is located and its cause often disclosed. The 'geography' of the colon is of much importance in many cases; its course, diameter, permeability and motility are definitely shown by the X-Ray. Distention of the sigmoid flexure is often demonstrated, giving a cause for remote symptoms due to pressure irritation or to toxin absorption.

"Thus the X-Ray is one of the most valuable and complete aids to diagnosis of conditions of the gastrointestinal tract to which the modern physician has recourse."—E. R. Hoskins and M. L. Burns.

## CHAPTER I

### DISEASES OF THE MOUTH AND THE SALIVARY GLANDS

#### STOMATITIS

This is an inflammation of the mouth and its associated structures, due to irritants, either mechanical, thermal or chemical, infection by fungi or bacteria, and accompanied by feverishness, discomfort or pain and other symptoms dependent upon the structural changes and the variety. In all forms reflex muscular contractions and hypersensitive areas are found around the angle of the jaw and the upper cervical region, both anterior and posterior.

Lesions of the hyoid, mandible, and cervical vertebræ are predisposing factors in the infections, or may be secondary. These lesions, as well as the reflex muscular contractions mentioned, may tend to delay recovery from the effects of either mechanical, thermal, chemical or infectious irritants.

#### ACUTE CATARRHAL STOMATITIS

(Simple stomatitis; erythematous stomatitis; catarrh of the mouth)

This is due to irritants of any kind. In poorly nourished children it is associated with dentition and gastrointestinal disorders; in adults with the abuse of tobacco or it may be caused by chemical and thermal irritants. It occurs constantly with indigestion and the specific fevers.

**Diagnosis.** It is marked by superficial redness, heat and swelling, dryness followed by increased secretion, and by swelling of the papillae of the tongue.

Feverishness is most noticeable in children. Discomfort particularly in mastication may be very annoying.

**Treatment.** Irritating factors must be removed. Food and drinks must be lukewarm or cool. In severe cases only liquid food can be given, and this should be taken through a bent glass tube or a straw. The mouth must be washed at frequent intervals with distilled or boiled water, or with mild solutions of boric acid, salt, etc.—anything which is non-irritating and gives a sensation of comfort and cleanliness.

Reflex muscular contractions should be relieved. Bony lesions especially of the hyoid, mandible, clavicle, and the cervical ver-



tebræ are to be corrected if possible without causing too great discomfort. If the corrective measures are very painful, it is better to delay that work until the acute stage has passed.

When the stomatitis is part of an acute infectious disease, the treatment for that disease is part of the treatment for the stomatitis. When mal-nutrition is present, the stomatitis usually persists or recurs until the general health is improved. In ordinary cases, the duration is about a week.

### APHTHOUS STOMATITIS

(Follicular or vesicular stomatitis; croupous stomatitis; "canker" sore mouth)

This is due to various causes—in children, to poor nourishment and uncleanliness, indigestion and fever; in women, sometimes to menstrual periods, pregnancy and the puerperium, and in men to protracted spree, and to general ill-health.

**Diagnosis.** The appearance is characteristic. To the features of the catarrhal form is added the formation of small, grayish or yellowish white spots, either simple or in clusters. At first vesicular, these later become ulcers of a dull opaque appearance bounded by a bright red hyperemic zone. They are found upon the lips, the tongue or upon the cheeks.

There is soreness of the mouth, increased secretion, heavy breath, and the symptoms of the associated disease. These ulcers heal rapidly when the constitutional condition is improved.

**Treatment.** The treatment of catarrhal stomatitis should be given, and to this added careful washing of the ulcers, preferably with mild boric acid solution. The gastric condition should be investigated, and appropriate treatment initiated for whatever gastric disorders may be found.

**Prognosis.** The ulcers disappear with remarkable speed when the cause of the stomatitis is removed; but they persist and recur obstinately unless the source of the trouble is removed.

### MEMBRANOUS STOMATITIS

(Croupous stomatitis)

This is a disease which resembles that just mentioned, except that instead of the formation of small ulcers, there is a dense grayish membrane over the mucous surface. It is sometimes diphtheritic (see diphtheria) and sometimes results from streptococcic, gonorrhoeal, or other infection. It may be present in the new-born, from gonorrhoeal infection; or from syphilis. The treatment is that of the infectious agent, plus that of aphthous stomatitis. The prognosis is rarely good.

### ULCERATIVE STOMATITIS

(Diphtheritic or fetid stomatitis; putrid sore mouth; gingivitis ulcerosa)

This is an acute affection, often epidemic.

**Etiology.** The disease results from defective sanitary conditions; poor nourishment; from exhausting diseases as diabetes, scurvy; poisoning from mercury, lead, phosphorus, or copper.

**Diagnosis.** The first changes appear in the gums around the roots of the teeth. The tissues are at first red, swollen, and edematous with warty projections, and the inflammation spreading along the line of the gums. Later, the parts become pale, spongy and friable, bleeding at the slightest touch, and eventually becoming necrotic. The ulceration may extend to the lips and cheeks, and may penetrate deeply to the bones. The teeth may fall out. The saliva is increased in amount and is acid in reaction; the breath is foul; mastication is difficult; the submaxillary glands are enlarged. The constitutional symptoms may be severe in children, occasionally resulting in death in debilitated subjects.

**Treatment.** This must be energetic. The ulcers must be washed with mild antiseptics frequently; a mildly alkaline solution is best. The food must be liquid, and must be taken through a glass tube, which must be kept well sterilized. The general condition of the patient must determine the quality of the food; in cases with symptoms of scurvy the juices of fresh vegetables must be given; in patients who are starved, broths, digested foods, etc., may be freely given.

Energetic stimulating treatment to the mid-thoracic region is indicated. The ribs should be raised carefully, avoiding too great tension upon the viscera. The gastro-intestinal symptoms must be met as they appear. (See diarrhoeas of children.)

**Prognosis.** If the tissue destruction is not marked, a good outlook follows proper treatment. In later cases, loss of the teeth, injury to the soft parts, and sometimes necrosis of the mandible may follow. The constitutional disease gives the more grave prognosis.

### PARASITIC STOMATITIS

(Thrush; sprue; white mouth; soor; muguet; mycotic stomatitis)

Thrush is due to the *saccharomyces* or *oidium albicans*. Predisposing causes are bottle-fed infants, debilitated adults, use of starchy and milk foods with imperfect cleansing of the mouth, catarrhal stomatitis.

**Diagnosis.** The disease first appears upon the tongue and inner sides of the cheeks as a diffuse reddening of the mucosa and the



formation of a glistening, slimy, somewhat adhesive exudate of grayish appearance. Small whitish dots next appear and stand out prominently upon the red hyperemic background. These patches tend to coalesce to form a membrane which when removed leaves a greatly reddened and often eroded mucosa, the membrane quickly reappearing. The growth of the fungus begins in the epithelial layer and extends to the deeper structures. Severe cases may include the palate, lips, pharynx, or esophagus, rarely the internal organs.

The mouth is usually dry, tender and painful. There is debility and gastric disturbance. The membrane can be readily removed, usually leaving an intact mucosa beneath.

The fungus is easily recognized by microscopic examination of a scraping.

**Treatment.** Food should be stopped for a few feedings, and plenty of water given. The mouth should be washed with cotton or gauze, in warm alkaline solutions. Cleanliness after recovery is important. The reflex muscular contractions should be relieved, even in very young babies. Rarely, vertebral lesions are found; these must be corrected.

**Prognosis.** Recovery is to be expected within a few days.

## MERCURIAL STOMATITIS

(Ptyalism)

This is due to the use of mercurial preparations medicinally or to handling of mercury as in certain occupations. The gums are swollen, red and sore, the salivary glands are enlarged and painful with greatly increased secretion.

There is a metallic taste in the mouth, tenderness upon shutting the teeth and fetid breath, mastication is difficult, the tongue is swollen, tender to the touch and covered with a heavy, creamy coating. If the case is severe, the teeth are lost, ulcers form, and rarely necrosis of the jaw occurs.

The duration is from two to four weeks.

**Treatment.** The first consideration is to stop the mercurial poisoning. The occupation should be changed if necessary. Out-of-door life is important. As rapid elimination of the poison as is possible should be secured by promoting activity of all excretory organs and assisting this by hot or Turkish baths. The stomatitis is only a sign of the general poisoning.

**Prognosis.** If the use of mercury is stopped, and the tissue destruction is not too great, recovery is complete. In more serious cases, the teeth are loosened, and may fall out.

### GANGRENOUS STOMATITIS

(Noma; cancrum oris; cancer aquaticus or water cancer)

**Etiology.** It is usually due to very insanitary conditions but may occur during convalescence from the acute fevers, measles, scarlatina, typhoid and pneumonia, especially in children between two and twelve years.

**Diagnosis.** It begins with the formation of a livid, swollen patch, usually unilateral, in the buccal mucosa, near the angle of the mouth or in the gums. Small blisters form, the tissues present a grayish-yellow inflammatory infiltration that quickly becomes gangrenous, spreads rapidly until the whole thickness of the cheek is converted into a reddish-black necrotic mass which may penetrate so as to involve the bones of the nose and jaw. The structures in the neighborhood are infiltrated and edematous. Septic infection of the whole system usually sets in with a fatal result.

The constitutional symptoms are great, fever irregular (103° to 104° F.) rapid pulse, delirium, diarrhea, and prostration. The breath has a peculiar penetrating and intolerably offensive odor. Aspiration (septic) pneumonia, gangrene of the female genitalia, and colitis are common complications.

**Treatment.** The disease does not occur in children who have proper care. When it is found, the only treatment is symptomatic and constitutional, according to conditions found in each case. Antiseptic washes are to be used.

**Prognosis.** The duration is from seven to fourteen days, when death is to be expected. In the rare cases of recovery considerable deformity is unavoidable.

### CHRONIC STOMATITIS

Is caused by chronic irritation due to smoking or by syphilis.

**Diagnosis.** The mucous membrane is infiltrated, lymph-follicles are enlarged, the epithelium is thickened and keratinized. Grayish or bluish-white flattened plaques are seen on the tongue and inner sides of the lips and cheeks. This condition may afford a starting point for carcinoma. The disease causes few symptoms, mainly irritative. The diagnosis rests upon the appearance of the mouth and the history of irritative factors.

**Treatment.** The irritating factors must be absolutely removed. The food must be non-irritating, smooth or liquid in consistency. Muscular contractions, especially around the angles of the jaws, and under the tongue must be relieved. Bony lesions must be corrected wherever found. Upper thoracic lesions are almost invariable. Clavicles and upper ribs are often at fault.



**Prognosis.** With persistent treatment, recovery may be almost or quite complete. More often hardened areas are left. The danger of beginning carcinoma must be recognized, as in leucoplakia buccalis. (q.v.)

### OTHER DISEASES OF THE MOUTH

The mouth is subject to various congenital deformities as tongue-tie, hare-lip, and cleft-palate, all of which are relieved to a greater or less extent by surgical measures.

The structures of the mouth are subject to diseases which may be a part of the general process or remain localized.

Syphilis, tuberculosis, actinomycosis, leprosy and glanders of the mouth are described in connection with the general discussion of these diseases.

**TUMORS.** The most common malignant tumor is the epithelioma. "Smoker's cancer" may be mentioned; also the cancer due to use of the betel nut.

Ranula are small retention cysts of the mucous glands.

The most common of the benign tumors are fibroids and papillae.

The treatment of all these is surgical; and the value of surgery depends upon an early diagnosis.

**RIGA'S DISEASE.** This is a strange local ulcer appearing near the frenum of the tongue. It is endemic and epidemic in Italy, but not seen in this country except among new arrivals. It is most frequent in teething infants.

### THE TONGUE

Since the nerves which control the tongue include vasomotor, secretory, sensory, and somatic motor elements, and since these have extremely intricate central relationships, the tongue is one of the important diagnostic structures of the body. Its appearance, control, and sensations are all important in diagnosis, under certain circumstances.

Pain from other organs is rarely referred to the tongue, but it is not at all rare for diseased conditions of the anterior part of the tongue to be associated with pain in the chin. Injury to the lateral area may cause pain under the jaw or around the hyoid bone, causing the patient to complain of a "stiff neck." When the tongue lesion is placed on the posterior area the pain may be in the sub-occipital region, and intense muscular contractions in that area may mislead in the search for a diagnosis.

**FETOR ORIS.** This is a common affection resulting from digestive troubles, local mouth conditions, all forms of stomatitis and pyorrhea alveolaris, tonsillar diseases, caries of the teeth, respiratory diseases from the nose to lungs, and certain constitutional diseases.

**Treatment.** The underlying conditions must be found before a permanent relief can be gained, and these carefully treated by correction of structural derangements, correction of diet and general hygiene, and insistence upon a strict regime of oral antisepsis.

**COATINGS OF THE TONGUE.** The appearance of the tongue is useful in diagnosis. The fur or coating is due to accumulated epithelium,

fungi, and food particles. It is uniformly seen in febrile diseases, gastro-intestinal disorders, naso-pharyngeal affections, and is not unusual in apparently good health.

Unilateral furring results from some disturbance of the second and third branches of the fifth nerve.

Circumscribed furring usually points to some local trouble.

White coating of fungi, bacteria, and desquamated epithelium arises from nerve irritation; disturbed circulation and innervation prevent normal formation and removal of the epithelium, and opportunity is thus afforded for the growth of fungi.

A flabby, swollen, indented tongue, covered with an even yellow, pasty fur is seen in catarrhal gastritis or gastro-duodenitis and in heavy smokers and drinkers. It occurs also in continued fever of some length.

A dry, brown, fissured tongue stained with bile is found in the low fevers, such as typhoid and dysentery.

A black tongue is observed in malignant fevers.

A bluish-black tongue is occasionally seen in Addison's disease.

A red, beefy tongue is seen in diabetes and wasting diseases.

The strawberry tongue, white with red points, is especially characteristic of scarlet fever.

A trembling tongue is seen in paresis and similar nervous diseases and in alcoholism and asthenic fevers.

## GLOSSITIS

Glossitis is an acute or chronic inflammation of the parenchyma of the tongue, usually due to injury, and characterized by great swelling, redness, and pain with difficult functioning.

It is due to direct injury as biting the tongue, erosion by the teeth, contact with boiling liquids or other irritants, corrosive poisons, the stings of insects, and other forms of trauma.

Subluxations of the atlas, axis, and other cervical vertebræ, the first rib, the inferior maxillary or the hyoid bone, and muscular lesions of the cervical and upper costal muscles affect the circulation through the tongue, and in this way slight injuries cause more serious inflammations; recovery is delayed by the same lesions.

The **superficial form** is catarrhal and results in denudation of the surface and is constantly present in febrile conditions.

The **deep form** consists of hyperemia, infiltration with leucocytes with perhaps atrophy and degeneration of the muscle fibers following, or abscesses may arise from pyogenic infection.

**Diagnosis.** The tongue is swollen, painful and hardened. Increased flow of saliva; difficult mastication, deglutition and speech; fever with its constitutional disturbances, and suppuration may occur. Reflex contractions of the muscles of mastication and deglutition are usually present. Hypersensitive areas are found around the mandibular articulation and in the neighborhood of the third cervical vertebræ.

**Treatment.** Relaxation of all the cervical muscles especially the deep ones and those at the angle of the jaw, correction of any deviations found either in the vertebræ or the ribs or the



hyoid are indicated. If pus has formed, incision is necessary. Heat applied at the angle of the jaw may give relief during the intervals of treatment. Tracheotomy may be necessary to prevent suffocation.

**Prognosis.** With early treatment recovery is to be expected. Convalescence is slow. The purulent form is serious. Gangrene is more frequent than spontaneous resolution. Death may occur from suffocation.

### GEOGRAPHICAL TONGUE

(Eczema of the tongue)

This is an inflammation of the tongue with desquamation of the superficial epithelium. The central portions of the round patches heal, which cause the tongue to resemble a map. Itching and heat may cause much annoyance. It is of unknown etiology; occurs in infants and children, not infrequently in adults, and is liable to relapse.

**Treatment.** The treatment is based upon the conditions as found on examination. Lesions responsible for the disturbed circulation include those already named in connection with glossitis. These are to be corrected when present. The condition of the digestive tract as a whole is to be investigated, and appropriate treatment initiated for whatever variations from the normal are found.

The food must be nonirritating and liquid. Strict milk diet has been useful in some instances. An examination of the blood will often give useful information concerning the requirements of the body.

**Prognosis.** Relapse is frequent. Recovery from each attack is to be expected, under proper care, but may be considerably delayed.

### LEUCOPLAKIA BUCCALIS

(Ichthyosis lingualis; buccal psoriasis; smoker's tongue; leuco-keratosis mucosae oris)

This is a most obstinate chronic inflammation of the tongue, probably due to syphilis, with thickening of the squamous epithelium and the formation of firm, often white or pearly glistening plaques, occurring most commonly in heavy smokers. The lingual papillae may be hypertrophied. It occurs in three varieties: (1) small, white slightly raised, even papillomatous spots (lingual corns); (2) a diffuse, thin, bluish-white or opaque white coating of the tongue, which is patchy and is most often seen upon the dorsum and sides; (3) diffuse oral leucoplakia involving the whole oral cavity and its mucosa. The edges of the patches are favorite localities for beginning cancer of the mouth.

**Treatment.** Surgery is advised when the patches are localized. Smoking should be discontinued. All irritating foods and drinks should be avoided. The removal of whatever lesions may be found interfering with the circulation may be tried.

**Prognosis.** The hardened areas can hardly be expected to disappear, except after long cessation of the irritating factors. Patients who have subjected the tongue to such treatment as is necessary to cause the disease, are hardly apt to endure the restriction necessary for recovery. The edges of the plaques are a constant irritant to the neighboring epithelium, and cancers often begin in these tissues. Patients in whose families cancer has appeared should be warned of this danger, and taught to avoid further irritation of the tongue.

### DISEASES OF THE LIPS

The lips are the location of a few primary affections and a number of secondary ones. They are often involved in ordinary cutaneous diseases such as lupus, eczema, tinea, circinata, psoriasis, urticaria, tuberculosis rarely, and occasionally syphilis. The possibility of chancre of the lips must not be forgotten.

**Acute Catarrhal Cheilitis.** The commonest affection of the lips is that which is called "chapping." This is a mild catarrhal inflammation, usually caused by the action of very dry or cold air upon the lips. It may be very severe in those who are exposed to the air from the desert or winter in a rigorous climate. The thickened epithelium is detached in shreds leaving the upper layers painful, bleeding, and the seat of subsequent inflammations. Picking at these shreds of skin makes the condition much worse. The fissures may be so deep as to cause great pain and considerable disfigurement.

The tendency toward chapping of the lips is noted in persons whose general nutrition is lessened in any way and also in those who suffer from lesions of the first and second thoracic vertebra.

The treatment of chapped lips includes their protection with some nonirritating oily material. Warm applications may be gratefully received. Patients who have a tendency to chapped lips upon slight exposure should receive examination into the predisposing factors present, and the removal of these if possible.

**Herpes Labialis** (Herpes facialis) is a disease of the lips present in fevers, especially in those included as "bad colds." The small vesicles which first appear may become infected with pyogenic bacteria, and develop into quite large and very painful ulcers. They may occur frequently, with no recognizable cause, in persons who are poorly nourished or exposed to improper climatic conditions. The treatment consists in protection with any mild and



pleasant oily or gelatinous material, the removal of the systemic conditions, and such other corrective measures as may be found indicated on examination.

**PERLECHE** is a serious disease of the lips, not frequently present in this country. It is present usually in children whose sanitary surroundings are not good. The inflammation begins at both corners of the mouth and extends to the middle line. The epithelium becomes whitened, softened and easily detached. The hyperemia and inflammation lead the child constantly to lick its lips, hence the name. A streptococcus infection is always present and the disease is transmitted from one child to another by the use of common drinking vessels, towels, etc. The most important factor in treatment is cleanliness. Corrective work in the upper cervical and upper thoracic region and such other treatment as is indicated by the general health of the child facilitate speedy recovery.

### THE TEETH

It has long been the tendency to consider the well-being of the teeth from the standpoint of local conditions in the mouth alone, and to consider diseases of the teeth from the standpoint of the dentist alone. This general attitude is not quite justified by the facts in the case. The teeth are well supplied with nerves, both sensory and vasomotor. It is probable that trophic nerves are distributed to the teeth also. So far as the effects produced as the result of bony lesions of the cervical and upper thoracic spinal segments there is no reason to exclude the teeth from the laws which govern other tissues of the oral cavity. Injury to the teeth produces reflex muscular contractions of the muscles of mastication and of the deep spinal muscles of the upper thoracic segments. These reflex contractions, especially if they are associated with bony lesions of the upper thoracic vertebræ, increase the painfulness of the injury and lessen the resistance of the buccal membranes to infection.

In all cases of pain associated with the teeth, especially that which persists for hours or days, vigorous treatment for the correction of lesions of the mandible and hyoid, the relaxation of the muscles already mentioned, and the establishment of better circulation around the mandible and the jaw will greatly relieve the pain and prevent much of the painful after-effects of such dental surgery as may be indicated in each case.

**Pyorrhœa Alveolaris** is a chronic pyogenic inflammation of the gums, around the sockets of the teeth, due to a specific amœba. Secondary infections with pyogenic bacteria are probably invariable. The collections of pus present in this disease may serve as a constant infection of the body. Many vague symptoms, and many cases of articular and other inflammations may be traced to pyorrhœa alveolaris and to abscesses at the roots of teeth. The microscopic examination of the fresh pus on a warm stage or a warm slide in a warm room gives the diagnosis of pyorrhœa. In doubtful cases an X-ray examination of the jaws is indicated.

The patient should be referred to a dental surgeon for local treatment. The correction of lesions as found permits more rapid recovery.

**Abscesses of the Teeth and Alveolar Processes.** These have been too long held as of merely dental interest. Recent studies of disease have indicated the presence of pus at the roots of the teeth in very many cases of toxemia, supposed to be autogenic, of vague symptoms of systemic infections, as well as in articular diseases.

The X-ray is of inestimable importance in these cases, and every patient who suffers from vague symptoms of toxemia should have X-ray plates made of the mandible and the maxillary bones. The ordinary dental examination of the teeth is often inefficient in these cases.

**Treatment.** The patient should be referred to a dental surgeon for treatment. The pus must be evacuated, and the tooth pulled or filled according to the local conditions.

### DISTURBANCES OF SALIVARY SECRETION

The activities of the salivary glands may be profoundly modified by nervous disturbances, poisons, or circulatory changes. Two opposite conditions may be found.

**Hypersecretion (Ptyalism).** This is an abnormal increase in the amount of saliva. It may be merely uncomfortable or may amount to several quarts in a day's time. Almost any stomatitis, many nervous states, gestation or menstruation may be associated with some ptyalism. Mercury, arsenic, iodine, copper, silver, and some other metallic poisons; pilocarpine, tobacco, muscarine and certain other organic poisons, may cause marked ptyalism. It is present also in diseases associated with nausea. Bony lesions do not often cause sufficient hypersecretion to result in discomfort, though these may increase the effects of other etiological factors.

**Hyposecretion (Xerostomia, aptyalism, dry mouth).** This is a diminution in the amount of saliva, and may result in serious buccal disease. The dry, red, glazed mouth and tongue, sometimes fissured, is characteristic and is very painful. Eating and speaking are alike painful, sometimes impossible while the condition exists. It is sometimes present to a slight extent in acute coryza, but in its characteristic form is found as a neurosis, more often in women. It is probably due to functional disturbance of the salivary center in the medulla.

**Treatment.** Recovery from both hypersecretion and hyposecretion depends upon the discovery and removal of the causes of the conditions. Drugs must be stopped; occupational causes must be eliminated; disturbed structural relations must be corrected.



Muscular tension in the neck and around the jaw should be removed; the application of hot compresses or of ice bags may relieve the symptoms for a time.

### ACUTE PAROTITIS

(Symptomatic parotitis; parotid bubo)

The pyogenic bacteria, the infectious agents of typhoid, syphilis, cholera, or any of the acute fevers or exanthemata, may gain entrance into the salivary glands and set up an acute inflammatory process. Mild infection leads to increased secretion and, later, more or less fibrous induration and perhaps stenosis of the ducts. Sialoliths may be formed. The secretion may accumulate behind the stenosis and a cyst of considerable size be formed. Pyogenic infections may cause suppuration with destruction of tissue.

Reflex muscular contractions cause difficulty in mastication. The jaws may be set so firmly as to suggest beginning trismus. Hypersensitive areas involve most of the tissues around the neck and the jaws. The mastoid process is often painful to the touch.

Injury to the pelvic or abdominal organs is sometimes followed by acute parotitis; recovery is usually uneventful, so far as the salivary glands are concerned.

Bony lesions affect the secretion and the circulation of the salivary glands; in order of frequency the mandible, hyoid, atlas occiput, axis, and the upper thoracic vertebræ and ribs and the clavicle have been reported in connection with acute parotitis.

**Treatment.** The atlas and axis seem to be most important from the structural standpoint. "The gland involved is generally on the side of the transverse process which is most anterior" (McConnell). "Pushing the surrounding tissues toward the affected glands, exerting no pressure directly upon them, reestablishes lymph drainage" (Emery). Other lesions often found include the upper cervical and the upper thoracic vertebræ, the upper ribs and the clavicle. These bony, and all muscular and ligamentous lesions, should be corrected wherever found.

**Prognosis.** If the causes can be removed, recovery is to be expected. When there has been much increase in the interstitial connective tissues, the gland may not return to its original size.

### EPIDEMIC PAROTITIS

(Mumps). See Acute Infectious Diseases

### CHRONIC PAROTITIS

(Mikulicz's disease)

This occurs when any agent irritating to the salivary glands is long continued. Probably the bony lesions mentioned in con-

nection with acute parotitis are more frequently important etiologically in chronic than in the acute diseases of these glands. The place of the bony lesion is found in its influence in predisposing to infection, and in delaying recovery. Mercury poisoning is an important factor in the chronic parotitis found in certain syphilitic cases. The use of calomel is of less importance in non-syphilitic cases than formerly. After mumps and other forms of acute parotitis a chronic inflammation may persist. Lead poisoning, chronic nephritis, and certain obscure gastro-intestinal diseases may cause chronic parotitis. Diseases of the ovaries and the testicles are sometimes associated with mild chronic parotitis. Inflammation of the lachrymal glands is a frequent complication.

**The treatment** is that of the causative factors. Mercury must be stopped, if it is being used as a drug or if it is an occupation-poisoning. The same is true of lead. Bony lesions are to be corrected as speedily as is possible under the circumstances. The treatment for acute parotitis is useful, especially in sub-acute cases.

**Prognosis.** Increase in the interstitial tissues is usually marked, and the gland can hardly be expected to return to its original size, especially if the disease is of long standing. Symptomatic recovery is usually secured, if the treatment is vigorously prosecuted.

### OTHER ABNORMALITIES

The salivary glands are rarely the seat of neoplasms. The only treatment is surgical, when treatment is required at all.

Glass blowers and those who play on wind instruments may suffer from distension of Steno's duct and even of the parotid gland with air. If disturbing symptoms are present the condition can be removed by catheterization. Change of occupation may be necessary.



## CHAPTER II

### DISEASES OF THE ESOPHAGUS

#### INFLAMMATIONS

Esophagitis or inflammation of the esophagus may be acute or chronic, and may be either primary or secondary.

**Acute Esophagitis** arises from intense mechanical, thermal or chemical irritants; as a secondary complication of the specific fevers; toward the end in wasting diseases; in infants as a purely catarrhal type often without apparent cause; and from local disease.

Congestion of the mucosa and exfoliation of the superficial epithelium occurs. The normally scanty secretion is increased. Shallow erosions result, situated mostly on the tops of the longitudinal folds. These, healing, leave small scars.

**Phlegmonous** or diffuse suppurative esophagitis may be traumatic, may be due to foreign bodies or corrosive substances, with subsequent infection. It occurs more commonly by extension from the pharynx, stomach, periesophageal lymph nodes, vertebral column or the cricoid cartilage.

This form begins as a purulent infiltration of the submucosa, leading to localized or diffused collections of pus, the mucosa is reddened and undermined and fistulous openings are formed. The surrounding tissues are sometimes involved and the abscess may discharge into the larynx, trachea, rarely into the pleura and mediastinum.

**Pustular.** The papules of smallpox in the mucosa may rupture, forming ulcers.

**Membranous.** This is not uncommon in variola, measles, scarlatina, typhoid and typhus, pyemia, cholera, chronic Bright's disease, pneumonia, tuberculosis, and the gastro-intestinal catarrh of infants. The fibrinous deposit is rarely generalized, but is usually confined to the tops of the folds. Ulceration may occur with stenosis of the lumen from cicatricial contraction. True diphtheria of the esophagus is rare.

**Exfoliative.** (Esophagitis denticans superficialis.) The etiology is not clear; in some cases is due to corrosives but usually occurs in neurotic individuals. The desquamation of the lining epithelium takes place in large flakes or as a complete cylinder.

**Corrosive Esophagitis** is due to corrosive poisons, chiefly acids and alkalis, as concentrated lye, carbolic and sulphuric acids. It is a necrosing inflammation resulting in serious contracture of the lumen if the patient survives.

**Catarrhal** may follow the acute form; may arise above a stricture, or may be the result of excessive alcoholism. The mucosa resembles that of chronic catarrhal inflammations elsewhere. Papillomatous or polypoid growths may occur, and leukoplakia may be present. The tenacious mucus or mucopus, the thickened muscular wall, and sometimes superficial ulcerations are the usual findings.

**Follicular.** The mucous glands are involved, the lumina are obstructed and there is excessive secretion, which leads to dilatation of the

glands and ducts into small cysts. There is round-celled infiltration around the glands which may result in abscess formation.

**Diagnosis.** The principal manifestations of these inflammations are: a dull pain under the sternum, difficult swallowing, tenderness over the cervical portion, and a copious mucoid secretion which is regurgitated or passes into the stomach. Cicatricial changes eventually lead to obstruction.

In the chronic form, in alcoholics, there is morning vomiting of esophageal mucus, sometimes mixed with the contents of the stomach. If the vomitus is only from the esophagus, the reaction is alkaline, but if gastric contents are present it is acid.

Foreign bodies may cause more or less complete obstruction and lead to phlegmonous inflammation or even to perforation.

**Treatment.** The treatment of all forms includes the relief of the underlying condition if the disease is secondary; correction of the cervical vertebræ which might interfere with the vagus; attention to the first to fifth thoracic; raising and spreading the ribs, especially at the sternal ends.

The diet must be absolutely non-irritating and liquid. It may be advisable to employ rectal feeding for a few days.

### CARCINOMA OF THE ESOPHAGUS

This is the most important new growth and may be either primary or secondary, occurring most frequently in males between 50 and 60 years, particularly in smokers and drinkers.

**Diagnosis.** The symptoms are progressive dysphagia, and great pain which may become so extreme that emaciation occurs rapidly. Regurgitation may take place at once or be deferred for ten or fifteen minutes, according to the location and the amount of dilatation. The ejected material may be mixed with blood and cancerous fragments. The cervical glands are frequently enlarged and may give the first indication of the trouble. The X-ray will give information as to position and extent of involvement.

For diagnosis it is important to exclude external pressure from an aneurysm or tumor; to exclude cicatricial stricture and foreign bodies; and, lastly, to pass the sound with the greatest possible care. Auscultation on the left side of the spine may detect altered esophageal murmur.

**Treatment.** The patient may be made more comfortable by thorough treatment from the occiput to the eleventh dorsal. Rectal feeding or gavage may be necessary from the first, but should be postponed as long as there is not severe pain. Gastrostomy may prolong the patient's life in more comfort than without it.

**Prognosis.** The case is hopeless, patients dying in from six months to a year from asthenia or from sudden perforation.



## ALTERATIONS IN THE LUMEN OF THE ESOPHAGUS

The alterations comprise two forms—stenosis or stricture, and dilatation.

**Stenosis** may be developmental or acquired.

The extrinsic causes are pressure from enlarged glands, aneurysms, and tumors of the lungs, pleura, or mediastinum.

The intrinsic causes include all forms of local inflammations, phlegmon, growths of thrush or tissue, cicatricial contraction of the wall from trauma, corrosives, syphilis, diphtheria, and foreign bodies.

**Diagnosis.** The symptoms depend upon the position and the degree of narrowing present. There is slowly increasing dysphagia which is common to all sites. Regurgitation of food is the most common symptom; if the stricture is high, the food may be returned immediately, if low after a slightly longer interval. Pain and emaciation follow when the narrowing is great. After all intra-thoracic diseases are excluded, the passage of an esophageal bougie determines the position and the degree. The X-ray may give an absolute diagnosis.

**Treatment.** If mal-adjustments are found affecting the innervation and the blood supply of the esophagus, see what correction will do for the case. If the cause is from cicatricial tissue, the passage of a bougie to secure progressive dilatation may effect relief. If the stricture is impassable, gastrostomy is the only means possible.

**Prognosis.** The prognosis is unfavorable except in cases of cicatricial contraction.

**Spasmodic Stricture or Esophagismus** occurs in neurotic individuals, especially young women, and also in elderly men, especially if hypochondriac.

**Diagnosis.** The trouble commences suddenly, usually during a meal, the food is retarded for some time, then either passes on to the stomach or is returned. It is attended by severe pain and retching. There is little emaciation.

On passing the sound, stricture may be found at different sites on different days, or it may be passed with ease at times. In some individuals the sound can always be passed without difficulty.

**Treatment.** The main treatment is that of the neurotic condition. Some specific lesion, especially in the upper thoracic region, may be found that has produced this particular attack. When the lesion is corrected the spasm disappears. Psycho-analysis is useful in hysterical cases.

As a last resort, passage of a full sized bougie two or three times a week may be necessary.

**Dilatation or Diverticulum of the Esophagus** occurs from pressure from within the lumen or from traction from inflammatory conditions outside of the tube, or may be congenital. The X-ray may give information as to the location and extent of the change in the lumen or the size, location and shape of diverticulum.

The most common symptom is regurgitation of the food.

**Treatment.** The causal condition must be cared for first. Surgery is a last resort.

**Cardiospasm** is a spasm of the circular muscle fibers at the cardiac orifice of the stomach. It causes a sensation of discomfort immediately after swallowing, and leads to dilatation of the esophagus. Since section of the vagus causes the condition, in cats, (Cannon) it seems probable that inhibitory influences acting on the vagus center might be responsible. At autopsy these muscle fibers are found hypertrophied. Rather rarely the condition is associated with ulcer or cancer of the stomach.

**Treatment.** Correction of lesions affecting the vagal or the splanchnic centers may give relief. Gradual and careful dilating with special instruments has been successful.

#### FOREIGN BODIES IN THE ESOPHAGUS

Coins, needles, pins, bits of metal, bones from fish and other foods, and many other foreign substances are often swallowed by accident or otherwise, and become lodged in the esophagus.

The history of the case should lead to an X-ray examination and thus the recognition of the exact location of the body. Its removal can be secured under the fluoroscope, if necessary.

After such an operation the food should be bland and liquid. The treatment advised for acute esophagitis should then be employed.



## CHAPTER III

### NEUROSES OF THE STOMACH

The neuroses are those disturbances of gastric functions which depend primarily upon disturbances in the nervous control of the organ, but which are not associated with recognizable structural changes in the gastric walls. These are classified briefly in the following outline; the description of each is given but the etiology and the treatment are given for all, since these factors are practically identical for all classes of neurosis.

Care in diagnosis is especially urged when gastric neurosis is suspected, since organic disease of the stomach may simulate nervous disease, and an error in diagnosis may cause fatal delay in efficient treatment for organic disease.

The neuroses include variations in secretion, sensation, and motion.

The **secretory** neuroses include those variations in the gastric juice due to disturbed nervous control, and not associated with organic disease of the stomach.

**Hyperchlorhydria** (hyperacidity) is a condition in which the gastric juice from the fasting stomach or after a test meal contains greater than the normal percentage of hydrochloric acid. It is doubtful whether a truly hyper-acid juice is ever secreted; variations in the dilution and in the combining substances, mucus, etc., present in the stomach probably cause the symptoms as found. These include a vague discomfort or burning pain, with weight and pressure in the epigastrium, perhaps with acid eructations, regurgitation and pyrosis, sometimes nausea and vomiting. Severe headache and vertigo are common. There is often a sinking feeling before meals. The pain lasts from one to three hours, and is relieved by vomiting or by taking some proteid food or an alkali. It is usually remittent, returning upon grief or worry, or without obvious cause, and finally becomes continuous. The bowels are constipated.

The usual physical examination discloses a moderate diffuse epigastric tenderness, with perhaps a slight dilatation.

**Gastric Analysis:** After Ewald's meal (one hour after), an excess of free HCl; three to four hours after a Leube-Rigel meal, the meat is digested but the starches remain unchanged.

**Hypochlorhydria** (anacidity; subacidity; *achylia gastrica nervosa*), is a diminution or absence of HCl, common in gastric cancer, pernicious anemia, and in atrophic gastritis, occurring not infrequently as a neurosis in hysteria, neurasthenia, and tabes dorsalis.

The symptoms begin with a sense of fullness and oppression after meals which may last all day, flatulence, headache, drowsiness, constipation, with the tongue pale, broad, flabby, and indented by the teeth.

The gastric analysis shows total acidity about 4; HCl and often the ferments absent; mucus absent; lactic acid absent except in traces.

**Hypersecretion** is an excessive secretion of hydrochloric acid and gastric juice in the fasting stomach, and is of two forms, periodic or intermittent (*gastroxyntic*) and the continuous or chronic form.

**Gastroxynis.** The patient is apparently well when he is seized with a sensation of epigastric uneasiness which develops into pain and is followed by nausea which is persistent. Vomiting of a large amount of very acid gastric juice ultimately tinged with bile occurs. This may be ejected at intervals of a few hours. The throat may become raw and sore. The attack as a whole lasts from one to three hours, terminating abruptly, but tends to recur at varying intervals. If the attacks recur one upon another, the condition merges into the continuous form. The paroxysms occur most often at night or in the early morning. *Tabes dorsalis* should be strongly suspected.

**Continuous Hypersecretion.** The early symptoms are those of either hyperchlorhydria or gastroxynis. The epigastric pain becomes habitual after meals, vomiting of an acid fluid, at first occasionally, becoming once or more daily, commonly after breakfast. The condition may be associated with pyloric stenosis or gastrectasis. Gastric analysis: An abnormally large amount of acid gastric juice free from fragments of food is obtained from the fasting stomach.

The sensory neuroses include pain and variations in the normal gastric sensations, not due to organic disease of the stomach. The "nervous dyspepsia" of older writers was chiefly sensory.

**Gastralgia** is a paroxysmal gastric pain which may be a pure neurosis or may occur as a symptom of organic trouble in gastric ulcer, cancer, or in gastric crises of *tabes*. The pain is relieved by taking food and is most apt to occur when the stomach is empty. The attack is frequently preceded by slight nausea, or epigastric pressure, salivation, faintness, vertigo, or headache. Shortly afterward, a severe and agonizing pain begins in the epigastrium, radiates to the back, and along the costal margins especially to the left, extending in some cases to the scapula and entire abdomen. The face is pale and anxious, the hands and feet cold, the skin cool and wet, and the body curved forward with the abdomen hollow. The attack lasts from a few minutes to several hours.

Pressure with the flat of the hand is often grateful during an attack. There is a slight tenderness in the epigastrium. Gastric analysis shows the HCl often in excess.

**Paroxysmal Bulimia (Hyperorexia)** is a condition seen in hysteria, neurasthenia, migraine, epilepsy, exophthalmic goitre, and cerebral tumors. It is characterized by sudden attacks of burning epigastric pain, faintness, headache, and excessive hunger, especially at night, the paroxysm being often relieved by taking food.

**Anorexia Nervosa.** Death may be due to this absolute loss of appetite, which is very extreme, the sight of food exciting a spasm. It occurs as an hysterical manifestation in girls of 15 to 20 years. The patient is restless, takes to bed, emaciation is progressive and frequently reaches an extreme degree, the skin becomes dry and brawny, contractures of the lower extremities may develop, and death has been recorded.

**Gastric Hyperesthesia.** This is a condition in which a sense of pressure, burning, fullness or weight, or gnawing pain, with tenderness in the epigastrium, occurs during the process of digestion. The gastric analysis shows a normal gastric juice and digestion.

The motor neuroses include variations in the tone of the gastric wall and variations in the peristaltic waves, not due to organic disease.

**Supermotility (hyperkinesis)** is an increase in the normal motor activity of the stomach, and causes a too early discharge of the ingesta into the duodenum. It is best recognized by the radiograph or fluoroscopic examination, which also indicates the presence or absence of ulcer.

**Nervous Vomiting** occurs in children and adults. The stomach contents are ejected without preliminary nausea and straining; this usually takes



place shortly after eating and at irregular intervals. The general health is unimpaired. Primary periodic vomiting may occur as a neurosis in otherwise perfectly healthy persons, especially women while menstruating. The condition is associated with deficient tone of the muscular ring around the cardiac opening, and appears to be due to defective vagal innervation.

**Peristaltic unrest** (*tormina ventriculi*) is an annoying condition seen after eating in which the peristaltic movements are hyperactive, causing loud borborygmi, gurgling, and splashing. These are intensified by emotion, and may extend to the intestines. The condition is a frequent symptom of hysteria or neurasthenia.

**Nervous eructations** (*aerophagia*) is characterized by annoying belchings of air which has been swallowed. It continues for hours or days, or occurs in paroxysms which are excited by emotion. Hysterical women and children or neurasthenic patients are most often so affected. Anxiety, palpitation, epigastric fullness and distress may attend the paroxysms.

**Rumination** (*merycismus*) is a rare condition occurring especially in the feeble-minded, or idiotic or insane, in which the patient regurgitates the food and chews the cud.

**Spasm of the pylorus** may cause retention of the food in the stomach beyond the normal limit. It is probably associated with variations in secretion.

**Etiology.** Rarely a gastric neurosis is due to a single factor. The predisposing causes include a neurotic inheritance; unhygienic conditions such as poor ventilation, worry or over-work, improper foods or improper habits of eating; unpleasant surroundings at meal time, and especially eating under the influence of haste or excitement or with a sense of disgust at the appearance of the food, the service, or any other factor which causes annoyance; imperfect mastication due to habit, bad teeth, or pyorrhea, or the habitual use of cathartics.

Vertebral, rib, or other bony lesions are probably the most important causes of gastric neuroses. These may act for many years as irritating factors before the onset of recognizable symptoms; in such cases questioning usually elicits slight gastric symptoms which have been long present. The lesions involving the mid-thoracic region, especially with rotation, are most common. The fifth to the ninth thoracic vertebrae are almost invariably found rigid, and usually the spinous processes of these are approximated. Cervical lesions are practically constant. G. W. Bumpus gives lesions of the ensiform process an important place in the etiology of gastric neuroses. Reflex muscular contractions affect the regions just mentioned, and also the muscles of the anterior neck region. Hypersensitiveness is usually widespread and varies from day to day in the same individual. Often the tissues near the vertebral subluxations are analgesic; in such cases the correction of the lesions is often followed by the appearance of considerable pain. This may last for some days, and the patient should be warned of this possibility.

Among the less frequent causes of gastric neuroses may be mentioned eye strain, nasal polyps, hard ear wax, adenoids, organic

disease of the pelvic organs in both sexes (especially of the rectum, ovaries, or testes), and other causes of nervous irritation.

Repressions of old emotional storms, especially of disgust, are sometimes important in etiology. This can only be certainly determined by the use of psycho-analysis, carefully adapted to the individual needs.

**Diagnosis.** The diagnosis of the gastric neuroses can only be made after all organic diseases have been ruled out. The blood and urine show only the characteristics of the neurotic diathesis with signs of malnutrition, if this be present. The X-ray is often the only method of distinguishing an organic from a nervous gastric disorder. Gastric analysis shows the distinctive secretory disturbances, but in most cases does not determine whether this is due to nervous or to organic changes. The recognition of the underlying neurosis should not be considered of too great importance, since neurotic individuals are certainly not less subject to organic diseases than are those nervously sound, and in many instances a neurosis is itself due to a previously existing gastric disease. Even after all care has been taken in diagnosis, cases supposed to be neurotic may develop cancerous cachexia or a fatal hemorrhage from ulcer; on the other hand, cases in which a fatal outcome from cancer is expected may recover apparently perfect health.

When organic disease has been recognized, the presence of an associated neurosis may be important in magnifying and complicating the symptoms. For this reason, the treatment advised for the neuroses may often be employed with excellent palliative effects, even in the most serious organic gastric disease.

**Treatment.** The treatment includes the removal of every etiological factor possible. The correction of structural lesions must be secured with the least possible irritation, as a rule, though in long standing cases with hyposecretion and akinesis the use of energetic and rather stimulating methods in the necessary corrective manipulations gives excellent results. In the cases with hyperkinesis and hypersecretion, especially with considerable pain at times, the manipulations required for correction should be given in a slow and gradual way, carefully avoiding any jerky or sudden methods. Some exceptions are found to these rules, but in general it is best to secure corrections very gently in those cases in which the normal activities and sensations are increased, and to employ more energetic and stimulating methods when the normal activities seem to be diminished.

Carefully graded exercises are useful, both for the direct and for the psychological effect.

Thorough inhibition of the splanchnics and the application of hot packs are beneficial in gastralgia.



Properly fitted corsets may give relief in neurotic women. In cases in which vagal functions seem at fault (vomiting, nausea, and others) the patient should eat while lying in bed, or in a semi-reclining position, so that the head is supported by pillows, with no weight upon the neck.

**The dietetic** requirements are varied. It is often best to advise that each meal consist of a single article of food. Very often, for the first few days, the patient may be allowed any one article he chooses, at each meal, and only one. From his account of symptoms during these few days, and the effect produced upon his digestion, the permanent dietetic instructions may be safely determined. Often five or even seven small meals are better than two or three ordinary meals. Exclusive milk diet may be useful.

Perhaps more important than the actual quality of food, in purely nervous disturbances, is the manner of eating. Leisurely habits, a calm mental state, and eating in a quiet clean place, of food that appears clean and attractive, is sometimes the most important requisite to recovery.

A glass of hot water half an hour before meals, or upon arising in the morning, or just before retiring at night, all give relief in some cases. Half an hour of rest, lying upon the right side, relieves the symptoms in many patients. Every case is a law to itself.

In some cases the use of psycho-analytic methods is advisable. It is usually best to delay this until structural corrections have been made and relief of symptoms is still delayed.

In hyperchlorhydria, an exclusive meat diet is often recommended.

In hypochlorhydria, a light, easily digested, mixed diet is best.

In hyperæsthesia, rectal feeding is sometimes necessary.

In hypersecretion, lavage is useful.

In atony, the meals must be small and frequent and the fluids limited; if with dilatation, lavage is useful.

**Prognosis.** In all neuroses the prospect of life is good, perhaps even better than for normal individuals; the average neurotic takes excellent care of himself. Recovery is usually slow, with many recurrences. If a patient has a fairly good heredity, and is willing to obey instructions and to submit to the treatment for the correction of the lesions, permanent recovery may be expected. Unfortunately, such patients usually cease being treated when the symptoms subside, and bony lesions are allowed to persist. Recurrences are almost inevitable if the underlying lesions are not corrected, or if the original causes of the neurosis persist or recur.

## CHAPTER IV

### ORGANIC GASTRIC DISEASES

#### ACUTE CATARRHAL GASTRITIS

(Simple gastritis; gastric fever; bilious fever; acute indigestion; subacute gastritis; acute dyspepsia; acute catarrh of the stomach)

Acute catarrhal gastritis is an inflammation of the stomach which may be infectious or toxic in origin, or may occur as a complication of other diseases, and is characterized by distress and tenderness of the stomach, severe epigastric pain, vomiting and slight constitutional disturbances.

**Etiology.** The exciting causes are: ingestion of unripe fruits, decomposed animal substances, irritant poisons, the abuse of alcohol, tea, coffee, etc. The predisposing causes are lesions of the spine from the fourth to ninth or the ribs, injury or irritation of the vagi, especially the right, or sudden strain or blow affecting the mid-thoracic spinal column. Even wholesome food, taken during extreme fatigue, or when serious emotional disturbance is present, may precipitate an attack of acute gastritis.

**Pathology.** The mucosa shows the usual inflammatory changes of an inflamed mucous membrane. The various epithelial cells of the numerous glands may become highly granular, undergo mucoid degeneration or desquamate. There may be minute extravasations of blood, hemorrhagic erosions, pustules, or aphthous patches. The submucosa is infiltrated and the whole wall may be congested. The pyloric region is usually affected.

A false membrane may be found in diphtheria, pneumonia and typhus; pustules in smallpox and multiple abscesses in pyemia.

**Diagnosis.** The onset is sudden in severe cases, with epigastric pain passing through to the back, accompanied by deep diffuse tenderness; the tongue is furred, the breath heavy; there is vomiting at first of the stomach contents of undigested food, then viscid mucus, and finally, bilious matter or blood-streaked material. There is slight fever with marked prostration; flashes of heat with sensations of burning in the palms of the hands and the soles of the feet may be present. In mild cases, the symptoms may be only abdominal distress, nausea, tongue heavily coated, and eructations ending in vomiting, which brings relief. There is either constipation or diarrhea.

Reflex muscular contractions in the midthoracic region are constant, whether preëxisting lesions had been recognizable or not. This spinal area is hypersensitive and the tissues have a stiffened, pasty feeling on palpation.



The region of the stomach is hypersensitive to pressure. When a strictly localized area of tenderness over the pyloric region persists a gastric ulcer should be suspected.

Gastric analysis shows deficiency of HCl, excess of the organic acids, mucus, and remnants of undigested food. Yeast may be present.

Acute gastritis may complicate and mask a number of other gastrointestinal and systemic diseases. Care should be taken to differentiate from general infections, gall-stone attacks, peritonitis, appendicitis, gastric crises of tabes dorsalis, pregnancy, early stages of ileus, and ulcer in dependent area of stomach in ptosis. The X-ray is often necessary for diagnosis.

**Physical Examination.** The spinal and costal lesions are as varied as are the cases, including entire spinal column flat and abnormally rigid; slight double curves crossing at the sixth dorsal and involving the whole spinal column; a rotation of the fourth to eighth dorsal with spines to the left; depression of the ribs from the fifth to tenth; various combinations of lesions.

"Contractions, coupled with soreness of the spinal muscles between fourth and eighth dorsal is almost a positive sign of dyspepsia in some form. Perhaps the most common vertebral lesion is a right lateral condition of one or more vertebrae between the fourth and eighth dorsal, though an anterior condition of one or more vertebrae in this region is a very common finding, and in about nine-tenths of the cases is due to a posterior lumbar. Rib lesions also are very common. A twisting or dropping down in the mid-axillary line of the fifth to eighth left ribs is often found in dyspepsia. This lesion may be independent of, or due to, spinal lesion. Other bony lesions affecting the digestion directly or reflexly may be found from the occiput to the coccyx."

—F. HUDSON.

**Treatment.** The correction of whatever irregularities are found in the structural relations is the most important factor and the treatments should be continued until the lesions are corrected and the hypersensitive areas are gone. The patient should be advised to keep as quiet as possible, although rest in bed is not imperative.

**Diet.** Until the symptoms have disappeared, no food should be allowed. Cool water may be given freely; hot water is given if the hunger is annoying. A little lemon juice or grape juice may be permitted when the patient finds the water alone distasteful. The abdomen should be palpated in all cases, and when fecal matter or accumulations of gas are recognized the colon should be washed in clear water or normal salt solution. Copious drinking of very hot water may relieve the vomiting and secure a more complete removal of the offending gastric contents.

Relief can sometimes be given by inhibition in the suboccipital triangles, or over the course of the vagus in the neck; this sometimes increases the nausea and should then be discontinued, if relief does not become evident in two minutes or so. Slow,

steady pressure, gradually increasing, should be given upon the area between the transverse processes of the fifth to the seventh thoracic vertebrae. An ice bag over the pit of the stomach or over the spinal column in the mid-thoracic region gives relief. Flatulency may be a very distressing symptom. Quick movements, increasing the flexibility of the entire lower thoracic spinal column, raises the blood pressure and facilitates the absorption of the gas. A hot water bottle may exert soothing and comfortable warm pressure over the pit of the stomach. Patients with gas in the stomach, at any time, should be carefully watched to prevent air-swallowing. This act, which seems to be almost instinctive, adds to the misery and prolongs the attack.

When toxic substances are present in the food taken or as the result of fermentative or putrefactive process, and are absorbed into the blood stream rapidly, the effect upon the system may be profoundly depressing. The phenomena usually associated with surgical collapse may be present. The treatment must be energetic and careful if the most rapid recovery is to be secured. The drinking of quantities of hot water is useful in promoting the elimination of the toxins from the body. Very free colonic irrigation serves the same purpose. The rather heavy, energetic treatment which increases the mobility of the spinal and costal articulations is also efficient. The ribs should be well raised. Care should be taken to avoid reflex muscular contractions, especially in the suboccipital and cervical areas.

**Prognosis.** In mild cases, the duration is from a few days to a week, terminating in recovery, although the strength may not be restored for some time. In the severer cases, the acute symptoms usually subside in from a day to four days under osteopathic treatment, and complete recovery may be expected within a week or two. The prognosis in the toxic form is very grave; many perish from the shock; others, later, from exhaustion and starvation incident to the destructive changes. Those who recover are nearly always affected with chronic gastric disturbances.

**Sequelæ.** Each acute attack predisposes to later attacks, and the condition of chronic inflammation may ensue. The reflex muscular contractions may be responsible for abnormal spinal and costal structural states, which also increase the danger of subsequent attacks, and of the chronic state of inflammation.

**ACUTE PHLEGMONOUS GASTRITIS** (abscess of the stomach). This is a rare condition, in which pyogenic bacteria invade the walls of the stomach, forming localized abscesses, or burrowing between the layers of the stomach walls. Practically the entire gastric wall may become converted into masses of pus, divided by strips and layers of the original tissues, now infiltrated and degenerated.

The diagnosis rests upon the high fever, severe pain, chills, and other symptoms of pyogenic invasion. Leucocytosis is present, and may help in diagnosis in doubtful cases. The vomiting of pus makes the diagnosis clear.

It seems probable that small abscesses may drain spontaneously into the stomach, and recovery may occur. The burrowing type probably is invariably fatal. When the abscess is localized, surgery may help, though the prognosis is bad under all circumstances.



## CHRONIC GASTRITIS

(Chronic catarrh of the stomach; chronic dyspepsia; drunkard's dyspepsia)

Chronic gastritis is a chronic inflammatory disease of the stomach, characterized by increased secretion of mucus, usually diminished gastric juice and degenerative changes in mucosa and muscularis.

**Etiology.** The causes of the disease are numerous, as is to be expected from its functional and structural relationships. It is more often found in men than in women, as is evident from the list of causes of the disease. Repeated acute attacks of gastritis may result in chronic inflammation. Both primary and secondary forms of the disease are recognized, in both of which the bony lesion is variably important in etiology. Primary chronic gastritis may result from irregular or hasty eating, worry or other emotional disturbances, especially at mealtime, and constant dietetic errors, which include too great proportions of fat and of carbohydrates; too much tea, coffee, alcohol or ice water, or the multitude of soda-fountain drinks; insufficient chewing; highly spiced and highly salted foods; the use of tobacco, and other bad habits. The secondary form is due to other pre-existing disease, as syphilis, nephritis, gout, anemia, chlorosis, diabetes, and others; local causes, cancer, ulcer, etc.; disturbances of the portal circulation, with or without cardiac disease or cirrhosis. Swallowing infected sputum or saliva, as in pulmonary tuberculosis, pyorrhea alveolaris, etc., may be responsible for the inflammation. Tight lacing is not now a common cause.

The most important bony lesions are those of the fourth to the ninth vertebræ and the corresponding ribs, lesions of the cervical region and of the first and second ribs and the clavicles. These act, probably through the related nerve centers, upon the stomach, affecting its secretions, muscular movements, nutrition, and circulation.

**Pathology.** Three states of chronic gastritis are usually considered in dealing with its pathology. These are probably to a great extent different stages in the same process, though it seems that in some individuals the picture is typical of one or another form from beginning to the end. The simplest and most tractable and probably the earliest pathological change in chronic gastritis is that which is best characterized by the expression, "simple catarrhal." In this type an increased amount of mucin is secreted. This is mixed with the food which is taken, and may be vomited or may pass on into the intestine and be digested. It forms a thick, more or less tenacious, membrane upon the surface of the gastric mucosa. This protects the mucous membrane from the stimulating influence of the food which is taken and also is itself an irritation to the underlying mucosa, preventing secretion and delaying muscular action. The mucous membrane may be grayish in color and usually shows small hemorrhagic areas, especially near the pylorus. The granular elements show various stages of mucous and fatty degeneration; erosion may occur in patches. Proliferation of the mucous glands is abundant. The mucosa may be thickened,

or may be thinned, through degeneration and erosion. The overgrowth of the sub-mucous connective tissue, with or without its subsequent contraction, throws the mucous membrane itself into irregular folds and ridges. Atypical branching of the tubules is frequently noticed.

**Hypertrophic Gastritis**, sclerosis of the stomach or cirrhosis ventriculi, is characterized by the presence of the changes in the mucous membrane already described, to which is added considerable overgrowth of the muscular and connective tissue walls of the stomach. The walls may become so thick and the contraction of the newly-formed connective tissue so profound, that the lumen of the stomach is greatly diminished. This hypertrophy is usually most marked around the pyloric orifice, thus giving rise to the condition called hypertrophic stenosis. This intense multiplication of the muscular and connective tissues lessens the elasticity of the mucous layer of the stomach, interferes with the circulation of the blood, and probably exerts more or less of a pressure effect upon the nerve plexus and nerve endings. As the result of this, the atrophy of the glandular elements is almost certain to occur.

**Atrophic Gastritis**, phthisis ventriculi, represents the terminal stage of chronic gastritis. The atrophic change may be the most conspicuous feature from the beginning, or it may follow the pathological steps which have just been enumerated. The surface of the stomach is smooth, glistening, grayish, like a thin sheet of connective tissue. Here and there small areas made up of remnants of the gastric mucosa may be discerned. Pigmented areas, the result of old hemorrhages, may be found. In the muscular wall, ridges of the hypertrophied muscle and connective tissue may remain; especially around the pyloric region considerable thickening may be present. But generally speaking, the stomach is left in the form of a thin, smooth, dry, inelastic bag which forms no secretion, originates no sensory impulses, nor is capable of reacting to any nervous stimulation.

**Diagnosis.** In the simple catarrhal form the symptoms are most varied. The appetite is capricious, there is little thirst, but the patient craves much fluid with his meals. After eating there is epigastric distress, oppression, sense of fullness, pyrosis occasionally, pain varying at different times, and these signs are associated with tenderness. The frequent eructations of gas may be foul or odorless, there is belching, and well-marked tympanitic distention of the abdomen. Vomiting, preceded by nausea, is rather frequent but irregular, the most characteristic being that in which the mucus is vomited in the morning on arising. Constipation is usually present but may alternate with diarrhea.

The tongue shows swollen papillæ, indented margins, red at its tip and edges. A bad taste of a dry, pasty, or salty character, especially in the morning on arising, and salivation often occurs. Palpitation of the heart is not uncommon. The "stomach cough" is due to a chronic pharyngitis which is often present. The nervous symptoms include headache, vertigo, disturbed or dreaming sleep, depression of spirits, yawning, drowsiness and a feeling of languor. In late stages, especially in the atrophic form, the symptoms and blood count may simulate pernicious anemia.

The spinal region is hypersensitive, especially just before an exacerbation. The subluxations include rotations anywhere from



the third to ninth dorsal vertebræ; flat spine, with any sort of individual lesions; double curves, crossing between the fifth and seventh dorsal; elevated or depressed ribs, corresponding to the vertebral lesions or sometimes a general dropping; more rarely, lesions of the first to third, or around the seventh cervical vertebræ affecting the vagi. Spinal rigidity is marked in all cases.

The **urine** is usually highly colored with a heavy deposit of urates, and calcium oxalate crystals are found.

The blood shows poor nutrition and frequently the eosinophiles are increased.

In **Simple Gastritis**, after Ewald's test meal, the HCl is diminished or absent, lactic and acetic acids are found, pepsin and rennin always present and an excess of mucus mixed with the food remnants. The fasting stomach contains a little slimy mucus and sometimes cells from the glands. Röntgenological examination is of value.

In **Hypertrophic Gastritis**, after the Ewald meal, HCl, pepsin and rennin are absent. The fasting stomach is empty. The motor function of the stomach may not be much disturbed or there may be hypermotility.

**Treatment.** Persistent and continued treatment to secure correction of any irregularities of the spinal or rib structures, and securing increased mobility of each articulation is essential.

**Diet.** Correction of the diet is absolutely necessary. Increased drinking of water, either hot or cold, is usually necessary. Regular meals of well-cooked, well-balanced food, thoroughly masticated, with such variations as the case demands, will materially assist recovery. A single article of food at each meal is sometimes well digested. The bowels must receive careful attention. Corrective and systematic exercises may be necessary to tone up the abdominal musculature. Washing out the stomach is sometimes necessary when vomiting persists or when there is much mucus. Drinking a half to a pint of hot water from a half to an hour before meals and especially before breakfast may be a substitute for the usual method of washing. Teeth and tonsils should receive attention.

**Prognosis.** If the condition is secondary the recovery depends upon the curability of the primary disease. In primary cases of the catarrhal forms recovery may be expected only in patients willing to cooperate in following out all dietetic and hygienic advice and having treatment regularly. Supervision with treatment as indicated should be continued for at least six months.

In the hypertrophic form a symptomatic recovery is possible. In the atrophic form a comfortable life depends upon the maintenance of hygienic conditions.

## GASTRIC AND DUODENAL ULCER

(Perforating ulcer; peptic ulcer)

Peptic ulcer is a gradually destroying lesion of the stomach or the duodenum, never below the bile papillæ (that is, in parts not exposed to the gastric juice). The ulcer is usually single. Rarely, two, or even several, may occur at the same time or in succession.

**Etiology.** The predisposing causes are: age, young women from 15 to 30 years, men toward middle life (recent surgical statistics increase the percentages of men); extensive superficial burns; overwork; poor food; anemia; chlorosis; lesions of the spine in the splanchnic area; (the sixth thoracic especially); disturbed circulation from any cause.

The immediate factors are not well understood, but include disturbed circulation and erosion of these areas through the digestive action of the gastric juice. Disturbed motility (spasm of the muscularis mucosæ) deranged innervation, circulatory involvement and infections and toxins are perhaps all possible factors in the pathogenesis.

**Site.** The solitary ulcer is most frequently found on the posterior wall near to, or involving, the lesser curvature and in the neighborhood of the pylorus. Acute ulcers may be found in the middle region, or at the cardiac end, but the cardiac orifice is rarely implicated. Ulcers may sometimes be situated upon the anterior wall and are then very liable to perforate. Duodenal ulcers are now known to be much more frequently present than was formerly supposed.

**Pathology.** The acute form is small, sharply punched out, and the edges are clear cut and soft, the floor smooth and the serous coat not thickened.

The chronic form, the typical ulcer, is round or oval, extending more or less into the wall of the viscus; has a characteristic funnel shape, the edges being terraced, more or less sharply cut, and gradually narrowing to the base. In very chronic cases, the edges may be rounded and the whole wall thickened with marked vascularity in the margins and base.

The floor is formed by the submucosa, the muscular coat or the serous coat, which may be thickened and adherent to other organs.

**In healing,** if the mucosa is alone involved, a smooth scar is left; but if the deeper structures were involved, cicatricial contraction may cause serious changes, a narrowing of the pyloric orifice, dilatation of the stomach or hour-glass contraction.

**Perforation** may occur with subsequent peritonitis; adhesions may form between the walls of the stomach and other organs so that the ulcer may burrow into them; gastro-duodenal fistula may form; perforation may occur into the pleura, or into the lesser peritoneum, giving rise to subphrenic abscess.

Hemorrhage may arise from the erosion of a large blood vessel. Healing occurs by the formation of scar tissue.

**Diagnosis.** There is no disease or condition which may have such characteristic symptoms, or which may be more ill-defined. The proportion of autopsies in which ulcers are found is much



greater than would be expected from the small number of cases in which the disease is recognized ante mortem.

**Pain and tenderness** over the epigastrium are constant. The pain is rendered worse by eating or by firm pressure, when the ulcer is located near the cardiac end of the stomach, but is relieved by taking food or drink when the ulcer is near the pylorus or in the duodenum. This pain varies with the location of the ulcer, is constant and well defined, and is accompanied by cutaneous sensitiveness or hyperalgesia extending further to the left. The upper belly of the left rectus muscle is frequently contracted.

The reflex area of spinal hypersensitiveness varies slightly, but is usually found between the sixth and the ninth thoracic spinous or transverse processes.

**Vomiting** may occur soon after eating or more frequently after an hour or so, and usually gives relief.

**Hematemesis** may be slight or copious, and may be directly fatal. Melæna, or passage of blood by the bowel, is present in about ten per cent of cases.

The appetite is good but the patient may be afraid to eat, lest pain is set up. The tongue is clean and may be pale and flabby.

The vertebral lesions may be anywhere in the splanchnic area, but those from the fifth to the ninth seem especially frequent. There may be lesions of the cervical region. The anterior ends of the eighth to the tenth ribs are usually subluxated.

There is usually found a circumscribed tenderness, or a tender spot, to the left of the eleventh or twelfth dorsal vertebræ. In old ulcers a distinct induration may often be felt near the pylorus. The X-ray gives exact information in a surprisingly large number of cases.

**The Blood** shows a chloro-anemia which may be 1,000,000 or less per cmm.

**Gastric Analysis** shows excess of free HCl (hyperchlorhydria). Increase of organic acids is rare, but may be present in old standing cases with dilatation. The stomach tube must be used with care. Blood is frequently found; sometimes there may be shreds of tissue or isolated cells from the edges of the ulcer. When the condition is coexistent with cancer, as often occurs, the vomitus presents very contradictory findings.

**Duodenal Ulcer.** Three symptoms form an almost pathognomonic picture; "hunger pain," pain coming on two to four hours after food and often at night, relieved by food, and situated in the right hypochondrium; tenderness in the right hypochondrium with rigidity of the right rectus muscle; repeated attacks of melæna, not accompanied by hematemesis, the stools being dark and tarry; history of digestive disturbances.

**Treatment.** Structural corrective work must be done until the spine and its associated structures are in normal adjustment, paying particular attention to the area of the sixth dorsal. The pain may be lessened by deep steady pressure through the splanchnic area. The vomiting is best relieved by thorough relaxation followed by deep steady pressure in the region of the fourth and fifth dorsals on the right side. Be specially careful in giving direct treatment or in palpating over the abdomen. Absolute rest in bed must be insisted upon for at least a month.

**The diet** at first should be very restricted. Rectal feeding, or none, should be given for a few days, in moderately severe attacks. Small amounts of very bland, easily digested, and moderately warm food may then be given at stated intervals. It may consist of milk or buttermilk or milk-gruel, of wheat flour or arrowroot, or if milk is not well borne, of egg albumen, or Leube's beef solution. "Milk surely has a specific action on the disease when hyperchlorhydria is present, as it usually is. The excessive quantity of acid is all used up in the digestion of the milk, so being removed from contact with the stomach walls in this physiological way, it is powerless to increase or perpetuate the trouble."—R. F. Weeks.

**Lavage** is useful when there is a complicating catarrhal gastritis, or for the removal of improper foods.

In active hemorrhage, ice bags over the abdomen, rectal feeding, and later hypodermoclysis may be used according to the case. Surgical interference is indicated in a chronic indurated ulcer; in mechanical interference with the passage of the gastric contents; in recurring hemorrhage; in perforation, very speedily.

**Prognosis.** Guardedly favorable, depending upon the patient, the severity of the symptoms, and the duration. **Complications** include hemorrhage and perforation. **Sequelæ** include stenosis from cicatrization. The relation of cancer to ulcer must not be forgotten.

## CANCER OF THE STOMACH

By far the most important of all the neoplasms of the stomach are the cancers. Some variation is noted as to the relative frequency of certain types, but the scirrhus and the colloid types occupy first place. Squamous epithelioma is occasionally found near the cardiac orifice; it probably originates in the epithelium of the esophagus, or from cells which belong to that structure. Sarcoma is rare; it is not to be distinguished from carcinoma except by autopsy or surgery.

**Etiology.** The true causes of cancer are yet unknown. There seems no doubt that almost any constant irritation may be an important factor. In some individuals inflammatory reproduction



of cells does not cease at a reparative stage, but continues on into the formation of malign growths. In acute and chronic gastritis, gastric ulcer, and trauma due to swallowing injurious objects, the stomach is certainly provided with sufficient causes of irritation. In its embryonic development considerable rearrangement of the cell masses is necessary; from the standpoint of Cohnheim's theory it is to be expected that gastric cancers should be relatively frequent, one-half of all cases. There is considerable evidence in favor of the view that an inheritance of possible cancer follows Mendel's law, being a recessive characteristic. Cancer is everywhere most frequent in late middle life and early old age. Rarely cases are seen in children, even at birth.

Gastric cancer is much more frequent among men than women.

Later statistics indicate constantly more closely the relationship between gastric ulcer and gastric cancer—the cancer arising from the edge of the ulcer. When the cell-multiplication characteristic of gastric ulcer and of catarrhal and hypertrophic gastritis is remembered, it seems surprising that this relationship has not long been recognized. Alcoholism is present in a large proportion of cancer cases. The place of tuberculosis, worry, and direct trauma is very uncertain.

The place of bony lesions in the etiology of cancer is still doubtful. Since these seem to affect the vasomotor control, the secretory activity, and the muscular activity, it would seem, *a priori*, that these might be responsible, at least indirectly, for the irritation which seems one factor in cancer growth. In some instances, it seems that nervous impulses may initiate cell reproduction, and it is thus possible that abnormal nerve impulses may be responsible for the constant and unbridled overgrowth; or it may be that failure of the normal controlling impulses is responsible for the continued multiplication of the cells.

In any event, the maintenance of a correct circulation and innervation for the stomach must be the best thing for resistance to disease and for recovery from injury.

**Site.** The growth may be situated at either orifice or in the wall, the pylorus first in frequency, then the lesser curvature and next the cardia. The carcinoma may infiltrate all the coats and invade the neighboring organs, the dilated lymphatic vessels of the serous coat being filled with the carcinoma cells. The retro-peritoneal, inguinal, thoracic, supraclavicular lymph glands become involved. Metastasis may take place through the blood vessels.

**Diagnosis.** Early diagnosis is difficult. When gastric ulcer becomes associated with diminished hydrochloric acid or its total lack, cancer should be strongly suspected. When men or women past forty become subject to gastric symptoms for which no adequate cause can be found, the diagnosis of cancer is probable.

The most satisfactory information comes from the study of a series of X-ray plates. Exploratory laparotomy may be indicated. The general symptoms are, loss of weight and strength; the skin is often of a yellow or lemon tint which with the emaciation gives the cachectic appearance; mild fever; indicanuria, edema, especially of the ankles, and constipation or diarrhea.

The functional symptoms include anorexia and nausea, though the appetite may remain good. Vomiting may occur early or late, varying with the case, and being more frequent when the orifices are involved. Hemorrhage in some cases is the first symptom. It is rarely profuse. Usually there is a slight oozing which when mixed with the stomach secretions produces the "coffee-ground" appearance of the vomitus. Pain is variable, most commonly in the epigastrium, and may be of a burning, dragging, gnawing character. It is not much relieved by vomiting; is aggravated by taking food, and is accompanied by marked tenderness of the epigastrium on pressure. It is most marked between the nipple line and the umbilicus in front, and between the fifth and twelfth ribs in the back. Lesions may be found anywhere from the fourth to the ninth dorsal vertebræ and in the corresponding ribs. These seem to be due to reflex muscular contractions. The ribs in general may be much depressed; neck lesions may be found. Bony and muscular lesions are probably secondary.

The tumor may be felt, is motile, changing with respiration, and is painful on palpation. The percussion note over the tumor is often flat.

The urine may be unchanged; it usually contains increased indican. An anemia simulating the primary pernicious type is sometimes present. The red cell count is always low, sometimes dropping progressively until death; the color index is usually below normal; nucleated reds are rare, and a leucocytosis is present, but varies greatly. Atypical cells are abundant.

**Gastric analysis.** The danger of perforation by a stomach tube in the hands of any but an expert—perhaps, even then—must not be forgotten. The vomitus and the washings should be examined frequently in suspected cases.

Probably the most important finding is the diminished or lacking hydrochloric acid. This condition may be present also in atrophic and in nervous gastritis, in carcinoma of the duodenum or pancreas, in pernicious anemia, and in other more easily recognized conditions. It is also true that there may be increased hydrochloric under certain circumstances, with cancer; as, for example, when a cancer arises from the edge of an ulcer. The low hydrochloric seems to be due to the presence of some combining agent, probably from the cancer cells themselves. Lactic acid is present only when there is a deficiency of hydrochloric. The growth of



the Oppler-Boas bacillus occurs only in the presence of lactic and the absence of hydrochloric acid. This gives it place in diagnosis.

Blood and pus are fairly constant findings. Often the examination of centrifugalized washings will show some of the cancer cells. These may be found in shreds large enough for frozen or paraffin section, and the diagnosis can then be made with accuracy. More often the cells are found in small groups; if these show irregular karyokinetic figures the diagnosis of malignant neoplasm is justified.

**Complications.** Secondary growths are common, especially of the liver and the lymph glands, especially one at the posterior border of the sterno-mastoid muscle. Perforation may cause sudden death.

**Treatment.** Early diagnosis is difficult and very important. Early surgical treatment offers the best hope of recovery. Palliative treatment is necessary in most cases. A good deal of the pain may be relieved by careful spinal treatment using such measures as are indicated in the particular case.

A milk diet or milk with other easily digested foods is advisable. Lavage may be necessary to control vomiting and excessive fermentation. The bowels must be kept normal. Enemas and rectal feeding are useful.

The pain can be controlled for a time by ice bags, etc. When the diagnosis of inoperable carcinoma, or recurrent carcinoma has been made, the patient should be kept comfortable though at the expense of a few days of life. So the use of cocaine, opium, and other analgesics is fully indicated. Toward the last it is sometimes necessary to use chloroform. The use of drugs should be postponed until the hopelessness of the case is evident.

**Prognosis.** Early surgery may give a good prognosis. Otherwise death is to be expected in about six months after the disease is recognized. The scirrhus type presents a somewhat slower progress than other forms.

## GASTRIC DILATATION

(Gastrectasis; pyloric obstruction; pyloric stenosis)

Gastrectasis is an abnormal increase in the size of the cavity of the stomach and may be from nonobstructive or obstructive causes. The normal stomach contracts when empty; a relaxed stomach, after food has passed from it, is atonic; it may be dilated or may become dilated at any time.

**Etiology.** The nonobstructive causes are due to atony of the muscular coat whether as the result of repeated overdistention with food, of constitutional diseases, as anemia, acute fevers or

chronic gastritis, or of defective innervation from lesions in the splanchnic region, general weakness from flat, ragged, rigid spines or those with curvatures. The rigid spine, with slight posterior curve, involving the tenth thoracic to the second lumbar vertebræ, is a very frequent etiological factor.

Obstructive dilatation is caused by stenosis of the pylorus from cicatrizing ulcer or from cancer; by pressure of the duodenum or contracture after duodenal ulcer; abdominal tumors; by contraction of pylorus; by adhesions in chronic gastritis.

In acute dilatation the predisposing factors are operation under general anæsthesia; severe and prolonged disease; indiscretions in diet; disease or deformity of the spine; traumatism. Direct causes are primary paresis of the gastric musculature, or obstruction to the onward flow of the gastric contents, especially to obstructions just below the bile papillæ of the duodenum, or at the point where the duodenum passes beneath the insertion of the mesentery.

**Diagnosis.** The symptoms occur at irregular intervals; pain may be several hours after eating; at the end of the day; or several days may intervene between attacks. There is diffuse burning epigastric pain relieved by vomiting which the patients often excite. The pain is most marked at night. Flatulence and constipation are common. The tongue is pale and furred, or red, smooth and shiny; or soft and flabby. There is loss of strength and flesh and the respiration and circulation are both affected. The patient is irritable, depressed, more or less melancholy and subject to vertigo.

In acute paralytic distention due to blows or operations upon the abdomen, the symptoms appear suddenly, the surrounding organs are interfered with, and collapse follows. At first there is some belching but the patient is soon unable to move the gas and suffers extreme discomfort, palpitation, and dyspnea. Vomiting is persistent and excessive, occurring at once or later. There are the same physical signs as in the chronic form.

The spine may be ragged, rigid, or flat or have slight curves. Individual lesions may be found anywhere in the splanchnic region. Less often lesions of the upper thoracic are found; sometimes lesions of the cervical vertebræ. When the central connections of the vagal and the splanchnic centers are remembered, it is evident that the lesions affecting gastric innervation may be very widely distributed.

When dilatation is marked, there may be seen abnormal prominence of the whole epigastric region. The outline of the greater curvature and sometimes the lesser may be visible. By forcibly stroking the epigastrium, peristaltic movements of the stomach



may be set up. In the atonic form, there is absence of peristaltic waves. A pyloric tumor may sometimes be felt on palpation.

The actual size of the stomach may be determined by artificial distention with fluid or gas, the greater curvature can then be percussed out. Succussion or clapotage can be heard at a time when the stomach should be empty.

By the passage of a hard sound, the depth can be determined. If over sixty centimeters from the mouth, there is some degree of dilatation.

The use of the bismuth meal and the X-ray will determine the size, activity and position of the stomach.

**Gastric Analysis.** The vomitus is larger in quantity than normal; is excessively sour, early due to excess of HCl and later to lack of HCl and an excess of organic acids; contains fragments of partially digested food, and microscopically shows the presence of the bacillus acidi lactici, bacillus butyricus, and the sarcina ventriculi. On standing, the stomach contents separate into three layers; the upper, frothy and containing mucus and fermenting food; the middle layer, clear and watery; the lower, finely divided and consisting of more or less completely digested food. In great dilatation, there is bacterial fermentation owing to the delay of the stomach contents.

**Treatment.** The correction of the spinal and rib lesions as found as well as the correction of any structural perversions that may be found anywhere in the body, is of first importance. Direct manipulation of the stomach through the relaxed abdominal wall is useful—this initiates contraction of the gastric muscle, as may be seen by watching the abdomen. The patient should be taught to do this night and morning. Thus the muscle is strengthened. Care must be used to avoid overfatigue. In the corrective treatment, the brisk, energetic methods should be chosen. If the manipulation slightly increases the blood pressure, it is probably more efficient than if the blood pressure decreases as the result of the treatment.

Many cases present a picture of general enteroptosis. In addition to the abdominal findings there is a stooped, slumped posture, round shoulders, ewe neck, depressed lower ribs, etc. Setting-up exercises, drawing the abdomen up and in, while at the same time slowly forcing respiration in order to develop the muscles thus used will, if persisted in, prove of great benefit. Then treatment of the viscera in the knee-chest position is of added value.

If it is possible to put the patient to bed, with quiet and comfortable surroundings, good nursing, and treatment every day, his recovery will be much more rapid. This should be continued until some diminution in the size of the organ occurs; he is then allowed to be up, to have a little more liberty in diet, and to have

the treatments at intervals of two, three, and finally, seven or fourteen days. He must return for examination at intervals for two years or more, if he is to avoid a recurrence of the trouble.

The intestinal condition should receive the attention required in each individual patient. No purgatives should be permitted; enemas may be used if necessary.

**Lavage** may be useful in removing the products of fermentation, as a palliative measure. It is less harmful to the stomach than the retention of this irritative material, but will not long be necessary, if the correct treatment otherwise is given.

**Diet.** Only small amounts of food, and very small amounts of water or other liquids, should be permitted at any one time; the intervals should be long enough to allow the stomach to become empty. Foods which ferment are to be denied; this includes chiefly the sweets, starches and fats. Beef is the favorite food; this is usually well liked, leads to increased gastric secretion and activity, and gives a sense of well-being that is comforting. Broths in small amounts; fruit juices, vegetable juices may be allowed at long intervals. The dry diet may be used; this is simply the giving of perfectly dry food, which must be chewed a long time before it can be swallowed. Very small amounts of food thus satisfy the appetite, and the nervous effect of a feeling of satiety is good.

An abdominal bandage is sometimes of benefit. A corset which exerts a very slight pressure upon the distended organ, and which supports it, may give much relief, especially to patients who must be on their feet much of the time.

In most obstructive cases surgery is the best thing that can be done. Gastroenterostomy or gastro-plication are most frequently needed. Other operations may be required.

In certain acute dilatations, if conditions permit, actually standing the patient upon his head for a few moments may give immediate and distinct relief. (This is, no doubt, due to the relief of the duodenum from pressure as it passes beneath the insertion of the mesentery.)

When the cause of the obstruction can be removed, the prognosis is good for recovery; after the surgical intervention, the treatment already advised should be instituted, with suitable modifications, according to individual needs.

**Prognosis.** Depends entirely upon the causative disease; but the treatment will require months rather than weeks of time, in mild cases.

Atonic cases often recover completely within a few months. If the original causes of the disease, indiscretions in food or drink, tight lacing, etc., are again permitted, further dilatation is to be



expected. If the spinal conditions are permitted to recur, the same thing is probable. Patients who have once suffered from dilatation may undergo exacerbations as the result of suddenly produced bony lesions, strains of the spinal column, or extreme fatigue. Too long continued standing is provocative of recurrences. Emotional states, especially depressive, are apt to result in relaxation of the gastric, as well as of other visceral muscles.

In obstructive cases, especially those due to post-ulcerative cicatrice, marked variations in the condition of the patient may lead to unbased cheerfulness in the prognosis; this is to be avoided under all conditions. After surgical relief of obstructions, recovery is not apt to be uneventful, though the treatment as indicated above prevents interruptions in convalescence to a marked extent. In those cases in which the obstruction cannot be relieved, considerable palliation is to be expected as the result of the treatment indicated.

The stomach once dilated probably is always more liable to dilatation than one which has retained its tone; therefore, the risk of later attacks should teach patients to avoid very carefully the things which originally caused, or which might cause, the gastric weakness or the subsequent distension.

## CHAPTER V

### DISEASES OF THE INTESTINES

The nomenclature of the diseases of the intestines is so confusing that an adequate arrangement is difficult. To find the same disease described under the same name by different authors is rare. The anatomical arrangement conforms best with the pathology but in some instances has been hard to follow. To classify according to symptomatology does not seem logical.

#### THE SYMPTOM DIARRHEA

Diarrhea is a symptom of intestinal inflammation of some kind consisting of frequent alvine discharges, the character of which indicates somewhat the seat of the lesion.

**Lienteric** stools contain considerable undigested food and point to inflammation of the stomach and upper bowel.

**Mucous** stools are those in which a large quantity of mucus is present and indicate inflammation in the lower bowel.

**Watery** or serous stools occur in nervous and colliquative diarrheas, enteritis, cholera, and similar affections.

**Green** stools are due to an excess of bile, chlorophyll, or bacillus pyocyaneus.

**Fatty** stools are produced by the ingestion of large quantities of fatty foods, by pancreatic diseases, and by the absence of bile.

**Purulent** stools arise from ulcerations along the intestinal tract or the rupture of adjacent abscesses into the bowel.

**Black** stools may be due to the presence of blood from hemorrhage high up in the bowel, to bismuth, charcoal or tannate of iron, etc., taken as medicine, or berries eaten freely.

**Red** stools result from the presence of fresh blood, or the administration of medicine containing hematoxylin.

**Bloody** stools (melana) result from hemorrhage from any portion of the digestive tract from whatever cause, infective, inflammatory, or traumatic.

Parasites or their eggs may be found in the stools.

#### INTESTINAL NEUROSES

Two classes of intestinal neuroses are to be recognized—those due to organic nervous disease, and those due to functional dis-



turbance of the nerve centers. The second class is of etiologic importance in almost if not all of the organic intestinal diseases, either directly (abnormal innervation), or indirectly (abnormal vasomotor control, abnormal function of distant organs—liver, heart, etc.). In the second class also are to be included the hysterical and neurasthenic states and neuralgias.

The neuroses may be secretory, motor, or sensory.

The sensory disturbances are usually associated with disturbances of secretion and motion, since the action of the secretory, vasomotor and visceromotor centers depends to a certain extent upon sensory stimulation.

**Enteralgia** (Neuralgia of the intestines) is most often found in hysterical patients; it may occur in the neurasthenic, or as a referred irritation from pelvic, hepatic or renal disease, or from bony lesions, usually of the innominates or sacrum. The attacks most often follow great fatigue or emotional storms. It is most frequent in poorly nourished patients. (See Neuralgia.) Hypogastric neuralgia is the term sometimes applied to enteralgia located around the coccyx or the perineum. It is accompanied by an irresistible desire to go to stool, but defecation is impossible. The pain is intense, often leading to unconsciousness.

The diagnosis rests upon the absence of every organic disease characterized by pain in the intestinal region, and the presence of the nervous disease or the neurotic state. The treatment is that of neuralgia. (q. v.) Careful inhibitory treatment over the sacral foramina will frequently give relief.

**Intestinal Anesthesia** involves the sensory nerves of the anal region, chiefly. This leads to neglect of defecation, and ultimately to constipation. In organic nervous disease, retained motor power of the membranes with lost sensitiveness leads to involuntary and often spasmodic defecation.

**Nervous Diarrhea** is characterized by frequent stools which show no abnormal characteristics other than that they may be rather softer than usual. Occasionally there may be diarrhea in the morning, with no trouble during the rest of the day or the night. No great pain, tenesmus or griping is present, and the nutrition is not noticeably impaired. Such attacks are frequent in neurotic individuals after excitements, shock, fatigue, etc. Any calamity—an earthquake, for example—is apt to be followed by many such cases. Care should be taken to differentiate possible achylia, Grave's disease and tabes dorsalis.

**Enterospasm** is a spasm of the circular muscles of the intestines; it may be so great as to cause occlusion, or only enough to diminish the size of the canal. The diagnosis is sometimes difficult and cases in which total occlusion has been produced in this manner have

been subjected to laparotomy. The tension usually subsides under anesthesia, returning with consciousness.

Experimentally, such spasms become more severe with ordinary stimulation, such as manipulation, salt crystals, heat or cold.

When the diagnosis has been made, the correct treatment is simply the correction of the bony lesions, followed by complete rest of the digestive tract as well as of the entire body. Relaxation should take place within a day, or two days at most. In some cases careful inhibitory work over the spastic area will give relief.

**Nervous Constipation.** In hysterical subjects, especially, constipation may be purely a neurosis. Involuntary or reflex movements, such as sneezing, etc., may then precipitate involuntary defecation. Probably most of these hysterical patients suffer from repressed emotions of disgust, and are best treated either by psycho-analytic methods, or by a frank discussion of the physiological needs of the body, with such methods of reëducation as seem best adapted to the mental needs of the patient.

The secretory neuroses include deficient secretion, one of the causative factors in constipation, or excessive secretion, which is associated with mucous colic.

**Mucous Colic** (Colitis colica; enteritis membranacea; tubular diarrhea; myxoneurosis intestinalis; sometimes called also mucous colitis). This is a neurosis affecting the large intestine, and characterized by the secretion of large quantities of mucus, and its passage with tenesmus and colicky pains. Nervous depression during an attack is common.

**Etiology.** It is chiefly found in neurotic women and girls. Direct irritation of the rectum is responsible in some cases. It is found in men who ride much on horseback or on the bicycle or motorcycle. Hardened scybala may cause attacks. Attacks are usually precipitated by emotional shocks, fright, etc., in typical neurotic patients. Bony lesions include chiefly the lumbo-sacral regions; less commonly the innominates and the mid-lumbar spinal column. Visceroptosis is frequent.

**Diagnosis.** The diagnosis rests upon the symptoms as given, and the passage of long ribbons or threads of mucus, sometimes resembling a cast; this is found to be mucus and not a true membrane by microscopical and chemical examination. In the intervals between the attacks no symptoms are present; rectal examination, X-ray, etc., give no evidence of organic disease, although care should be taken that the colitis is not secondary or symptomatic of chronic appendicitis, cholecystitis or chronic intestinal obstruction.

**Treatment.** The treatment is that of the underlying neurosis. Correction of the bony lesions is most important. Irrigation of the colon gives relief. Rest, good hygiene, sometimes change of cli-



mate, are all very useful. Place patient in the knee-chest position and carefully elevate sigmoid. Direct treatment over the bowel, especially the lower colon, is effective. Do not treat directly if there is ulceration. If spastic condition is marked the constipation will be increased.

The diet is important. As a rule do not prescribe a bland one. Give plenty of milk and cream, butter and bacon, coarse vegetables and fruits. Thoroughly masticated skins and seeds materially help in removing the mucus.

**Prognosis** is good, though recovery may be slow. Patients with local rectal irritations recover at once, on the removal of the irritating agents. Recurrences are to be expected, if the original cause is allowed to persist.

### COLIC

This term is rather loosely employed with reference to abdominal pain which is remittent or intermittent, and is associated with muscular tension. The pain is very often extremely severe, and this, with the apparent collapse, often renders an immediate diagnosis impossible.

The first necessity is relief of pain, after which a more exact diagnosis can be made. This relief may be secured by the application of heat; by pressure upon the pit of the stomach or around the spinal regions of most contracted muscles; by drinking warm liquids; by warm enemas; by compelled long, slow respirations, etc. With even partial relief of the pain, diagnosis may become evident.

**Intestinal colic**, uncomplicated, is indicated by little or no vomiting; some sweating, mild degree of collapse or none; no pyrexia; pain is diminished on pressure, or application of heat; free abdominal movements with respiration; slow pulse or only slight increase in rate; patient not rigid in position; history of constipation or of improper food or of emotional storm or of some other efficient cause, or of previous attacks.

**Inflammatory diseases** of the intestines may give rise to this symptom. This is indicated by rise of temperature (above 100° F.), rapid pulse, diarrhea, pain increased on pressure or application of heat; abdominal muscles rigid during respiratory movements; position of patient rigid, varying according to location of inflammatory process; local symptoms, etc. In peritonitis and adhesions localized in movable parts the pain is usually in the region of the umbilicus; if localized in fixed parts, the pain is usually in the region affected.

**Perforation** is indicated by severe collapse, history of possible causes of perforation, etc. Intestinal obstruction gives repeated

vomiting which becomes fecal; gastric crises in locomotor ataxia and other nervous diseases give pupillary and other symptoms.

In children the referred pain in Pott's disease and appendicitis may simulate colic.

**Colic of the ileo-cecal region** has been described in connection with the passage of large, hard material through that valve, or its retention in that region. Adhesions may be a causative factor. The diagnosis is suspected upon the occurrence of colicky pain in the right iliac fossa, without fever, with sudden termination and no recurrence. The diagnosis is verified upon the appearance, a few hours later, of the hard material in the feces. (The delay in the colon may be several days or more than a week.)

**Renal colic.** The passage of renal calculi may simulate colic. The pain radiates downward, to the labia in the female or the testicle and penis in the male, to the thigh in either; frequent voiding of small amounts of urine, which contains blood and kidney epithelium make the diagnosis certain; the X-ray may give the exact diagnosis. In tubercular kidney the passage of masses of pus and coagulated blood may cause renal colic.

**Pancreatic colic** is very rare and probably impossible of definite ante mortem diagnosis without exploratory incision. Intense jaundice and large gall bladder due to the occlusion of the ductus choledochus by the pancreatic stone, or to the swollen and inflamed duct in pancreatitis, confuse the diagnosis with biliary colic. Pigmentation of the skin with wasting may lead to a suspicion of the disease, which is further justified by the finding of undigested fat and starch particles in the feces; a large and very pale, offensive stool is characteristic.

**Biliary colic**, due to the passage of gall stones through the duct, is usually easily recognized. Vomiting, sweating, shivering and signs of collapse, the expression of terrible anxiety and pain, with the location of the pain over the gall bladder, and darting into the right shoulder, render the diagnosis easy, as a rule. Deep tenderness over the gall-bladder is very suggestive. When the stone occludes the duct the jaundice may be very severe. After an attack the feces should be strained and washed, until the stone is found and examined. X-ray plates, especially stereoscopic, are helpful.

**Lead colic.** This form of colic may be recognized by the presence of the blue line around the gums; the history of working in paint, in lead mines, etc., or of drinking water or beer which has stood in lead pipes; by the associated nervous symptoms, such as wrist-drop, and by the lack of fever, the rapid anemia and the mucous hemorrhages; urinalysis shows mild nephritis findings.



The blood shows secondary anemia plus basophilic granules in the erythrocytes. Pressure relieves the pain.

### INTESTINAL COLIC

(Enteralgia; tormina; gripes)

Intestinal colic is a spasmodic contraction of the muscular layer of the intestines occurring as a symptom of several intestinal diseases and also alone. It is characterized by acute paroxysmal pain near the umbilicus which is relieved by pressure and is associated with feeble heart action.

**Etiology.** Constipation, the presence of undigested food, abnormal amounts of bile in the intestinal tract, structural lesions of the intestinal wall, lead poisoning, various diseases, and reflex impulses are all causative. Lesions of the splanchnic area, interfering with the normal control of the muscular activity of the intestines and secretions of the mucous membranes are also of utmost importance in the etiology.

**Diagnosis.** Paroxysmal pain of a tearing, cutting, pressing, twisting, pinching, or bearing down character, centering around the umbilicus, is the main symptom. The abdomen is tense and pressure relieves the pain. In severe attacks the surface is cold, the features pinched, the pulse small and hard, and there may be nausea, vomiting and tenesmus. Constipation is usual. The duration is from a few minutes to several hours, often with intermissions and usually terminating by the discharge of flatus.

Muscular contractions may be found along the spine corresponding to the area involved. There may be a definite subluxation either of the vertebræ or ribs which may bear a causative relation. The abdomen is tense but not painful on palpation.

**Treatment.** As soon as the attack appears, hot moist compresses or a hot water bottle may give relief—this may precede the arrival of the physician. Relief of the acute pain is the first essential. Muscular contractions will be found in the spinal areas corresponding to the intestinal area affected; commonly the eighth to the eleventh thoracic for the small intestine and the second to the fourth lumbar for the large intestine. Deep, steady pressure, gradually increasing, over these muscles and near the spinal processes of the corresponding vertebræ will give relief; a hot pad over the same area may prevent subsequent contraction. In any case, the treatment is best applied to the areas of reflex muscular contraction. (The higher the area affected, the longer time is usually required for relief, under ordinary medical treatment. Little difference is noted under osteopathic care.) When the muscular contractions have disappeared, bony lesions in the same area are fre-

quently found. Correction of these facilitates more rapid recovery and helps to prevent recurrence of the attack.

If the abdominal muscles are contracted or if the intestinal contractions are palpable a gentle manipulation of these contracted areas is indicated. If possible utilize the knee-chest position and carefully locate and release the tissues about the tender area. Deep, steady pressure over the solar plexus may relieve the pain, promote normal peristalsis, and thus the elimination of gas and feces. Raising the ribs increases the rapidity of the circulation, raises the blood pressure and thus helps in carrying away carbon dioxide from the intestines to the lungs and thus from the body. If conditions permit, abstinence from all food for two or three days, with plenty of hot water to drink, will release the spinal rigidity so that adjustment is comparatively easy. Regulation of the diet and correction of bad habits is essential to permanent recovery.

**Prognosis.** Recovery is to be expected, with proper treatment, in a few minutes to a few hours. Recurrence is to be expected if the original causes persist or recur. Important in prophylaxis are the correction of bony lesions; the removal of low blood pressure; the modification of diet; and the establishment of normal bowel habits.

## CONSTIPATION

(Costiveness; intestinal torpor)

Constipation is the retention of feces in the colon for a longer time than is normal to the individual, resulting in abnormally dry, hard feces, usually voided at irregular and considerable intervals.

**Etiology.** The causes are dietetic, habitual and nervous, local, and constitutional.

The dietetic errors include: Diets of too concentrated foods, or of too little quantities, which fail to give normal mechanical stimulus; diets of too great preponderance of waste material and of too great abundance, thus dilating the colon; and those containing too little water.

Habitual and nervous errors include: Failure to defecate at proper intervals, especially at the natural stimulus; use of drugs; abnormal control of the nerve centers, due especially to bony lesions of the innominates, sacrum, coccyx, and the lumbar vertebrae; to frequent jarring, as of cars, etc., and to hysteria and the neurasthenic states.

Local disturbances of the muscles of the cecum, colon, sigmoid and rectum and of those of defecation, and local disturbances of sensation of the rectal and anal region may be due to wrong position at stool (the modern toilet seat is abominable); the pressure of clothing; atony with or without visceroptosis; deficiency



of the digestive secretions and of mucus; stenosis, due to cicatrices or to contractions of the sphincters; hemorrhoids, fissures, ulcerations or coccygodynia. Local obstructions may be due to tumors, uterine malposition, pregnancy, enlarged prostate or others.

Constitutional causes include certain anemias, acute fevers, and cerebral affections.

There may be hypertrophy of the muscular coat of the descending colon or there may be small ulcers in the cecum; there may be thinning of the walls and dilatation of the whole colon. Enteroposis is frequent. The sigmoid may be congenitally longer and more tortuous than normal. Intestinal atony and intestinal spasm are frequent. Spasticity, inflammation and adhesions of the sigmoid area are common causes.

**Diagnosis.** The main symptoms are diminution in the frequency of the bowel movements; the feces are of undue hardness; there is need for great straining at stool; defecation may be painful. The local symptoms are: Sensation of fullness and weight in the rectum or in the abdomen; spurious diarrhea or diarrhea of constipation with some pain, tormina, or tenesmus but not giving relief to the fullness; pain in the left groin and down the left thigh and in the back.

The general symptoms are many times lacking. Debility, lassitude, fetid breath, impaired digestion, vertigo, variable appetite, furred tongue, flatulence, depression and mental torpor may occur. Dilatation and ulceration of the colon, piles and hemorrhoids may ensue. The colon may be outlined by palpation, being filled with a "doughy-feeling" mass. The abdomen is distended. The diagnosis is to be made carefully; sometimes only a purgative-habit is present; occasionally the patient only supposes himself constipated on account of some personal idiosyncrasy. Careful examination is necessary to determine the actual condition present and to elicit as much information concerning the habits as possible. Constipation is more often a symptom than an actual disease.

The X-ray is invaluable. Barium or bismuth enemas show the size, position and activity of the colon, sigmoid, and rectum.

**Treatment.** Purgative medicines must be stopped absolutely.

The correction of structural mal-adjustments is of prime importance. Dorsolumbar rigidity must be relieved. Corrective treatments should be given briskly, thus restoring something of normal stimulation to the inactive nerve centers of the dorsolumbar spinal segments. However, if spinal adjustment is specific and immediate normalization of nerve impulses will shortly be forthcoming. Treatment of the ileocecal and sigmoid areas while the patient is in the knee-chest position is effective. The lower ribs should be raised; this may be associated with forced respiratory movements, to advantage. Lesions should be corrected, wherever they

occur; indirectly, distant lesions may be efficient etiological factors in constipation or diarrhea.

A regular habit of going to stool must be taught. Beside going at a certain fixed hour each day, the patient must remain a sufficiently long time to allow a thorough evacuation. A small warm water enema may be used to start the fecal column when necessary. Using a stool under the feet of a sufficient height to bring the knees well up above the plane of the iliac crests, helps make the lines of pressure exerted by the accessory respiratory muscles in the expulsion more nearly normal. The pressure is thrown upon the descending fecal column rather than upon the fundus of the uterus or upon the prostatic region.

"The intelligent treatment of constipation is no exception to the rule and depends upon diagnosis, and, of course, will vary somewhat according to the case. I very seldom see a case oftener than twice a week, many cases only once a week. All osteopathic lesions that could in any way be contributing factors are given appropriate treatment. If faulty posture has contributed to these conditions, the patient's attention is called to the fact, and his or her coöperation requested. I assure myself that my women patients are wearing properly fitted corsets and that they know how to put them on."—E. C. Bond.

Dietetic errors as found must be corrected. In some cases, a bulky diet is advisable with many vegetables and fruits. In these cases exclude all meats; this will change the intestinal flora. Two to four tablespoonfuls of flax seeds per day, swallowed without mastication, will carry considerable moisture to lower bowel. Paraffin oil by mouth softens the fecal mass. Water must be used sufficiently to produce a normal quantity of the digestive juices, at least two quarts each day. Systematic exercises are necessary to a recovery. Walking is the best as it brings all muscles into play. Various games and gymnasium exercises are good. Special exercises should be planned for each patient.

The immediate evacuation of large masses of fecal material, long retained, and dry in the colon, is not usually wisely attempted. Cleansing the lower bowel by warm normal saline enemas is indicated. The container should not be more than two feet above the body, so the water can flow without great pressure. Only small amounts should be used at any one time, to prevent distention. When the first water has been ejected, another small quantity may be used, and so on until the rectum is fairly well cleansed. The next day the performance is repeated, and so on until the colon appears empty of the offending material. When the water is irritating, or when it fails to properly soften the fecal masses, warm oil or bland solutions of soap, glycerine or molasses may be used. The oil may be permitted to remain over night or for several hours in the sigmoid. Care should be taken to avoid fatigue.

Uterine mal-positions should be corrected. Tumors, enlarged prostate, and other local obstructions must receive such treatment



as is indicated on examination. Piles and hemorrhoids may require surgical care. Sometimes palliative treatment is useful.

The following treatment for hemorrhoids is given by Dr. Ella D. Still: "Find and treat cause for constipation; next, replace coccyx; last, straighten up rectal tissues. Put patient in genu-pectoral position, introduce finger and gently push the tissue up, having the patient inhale deeply during the time. I carefully dilate sphincters, first introducing one and then later two fingers. All this should be gently done, otherwise the parts are irritated. Particularly in bleeding hemorrhoids, have the patient wash out the lower bowel each time after defecation, for the parts must be kept clean. Use only a small amount of water, never more than a pint."

"In considering hemorrhoids one must recognize that there are those that may be successfully treated by non-surgical methods. Those responding to such treatment are what are termed simple hemorrhoids where vessels are dilated but no great tissue change has taken place, the causes for which may be located anywhere from liver to rectal sphincters. These cases demand thorough examination as cures cannot be expected unless *cause* is removed.

"When there are bony lesions I find the innominate and sacro-coccygeal most common. In women, where displaced pelvic organs are the cause of trouble, treatment must be directed to that area. Constipation must be relieved and rectal sphincters dilated. In nearly every case there is more or less prolapsing of rectal tissues which I straighten out by first placing patient in Sims position while I carefully dilate rectal sphincters. Then have patient assume genu-pectoral position while I gently push up on rectal walls, thereby lifting the hemorrhoidal veins.

"The postural treatment may be used by patients daily to good effect."—Ella D. Still.

In order to prevent hemorrhoids and piles, and to delay the progress of these conditions after they have been initiated, the use of warm water or oil to soften the fecal mass should be employed daily, until no longer necessary. The use of small quantities of water for this purpose is no more abnormal than is the use of soap and water for cleaning the skin of the surface of the body, or the use of oils for softening any kind of dirt which might have dried upon the skin. The need for this procedure should be temporary, as the correct treatment should bring normally soft fecal masses to the rectum. Remember that in ulceration and marked spastic states manipulation of the bowels is contraindicated.

It is important to know when to advise surgery in these cases, and when to endeavor to relieve conditions by palliative measures.

"So long as the veins retain their tonicity and there are no thrombosed areas or the vein walls have not thickened to any great degree or the hemorrhage is not too profuse, osteopathy will cure almost every case if the doctor who has the patient in charge will insist upon a thorough course of treatment. As a rule, when the hemorrhage is profuse and frequent, when the vein walls are thickened with or without much prolapse or when the piles are very painful, surgery has its place and can cure most of these cases. Many of them require, however, a combination of surgery and osteopathy to effect a cure, for constipation and portal circulatory disturbances must be cleared up before one can be positive that the condition will not recur."—S. L. Taylor.

**Prognosis.** The outlook is favorable for recovery but the course is likely to be prolonged. As complications and sequelæ, are to be

mentioned hemorrhoids, impaction, anal fissures, and ulceration of the colon or rectum.

## INTESTINAL AUTOINTOXICATION

(Chronic intestinal stasis; Rigg's disease)

Intestinal autointoxication is a condition due to the retention and absorption of toxins produced in the intestinal tract, and characterized by vertigo and headache, furred tongue, foul breath, anorexia, stomatitis, and symptoms of kidney, liver and bowel inactivity without organic disease of these organs.

**Etiology.** The causes of the condition are not well understood. The formation of toxic substances by the membrane of the upper intestinal tract has been experimentally demonstrated. Ileal stasis, enteroptosis and adhesions are other causes; these conditions can best be recognized by a study of X-ray plates, usually with barium or bismuth meals. Dietetic errors, constipation, lesions involving the lower thoracic and upper lumbar spinal column and the lower ribs, and a generally depressed state of the nervous system are considered causative factors. Deficient water intake, and deficient oxygen supply are certainly often important in etiology.

"The dietetic errors frequently include too high proteid intake. Any diet which is unbalanced may cause the condition; food-faddists of any type are very subject to the trouble. Disturbed relations of the various groups of intestinal flora, and of these with the digestive secretions, have been considered causative. A lack of the bacilli coli communis has been considered responsible, and attempts made to treat the disease by giving cultures of this organism in alkali-soluble capsules. Sour milk and cultures of lactic acid bacilli have also been used, according to the Metchnikoff theories. Recent investigations show a toxic element in the succus entericus, which, injected into the bodies of animals, cause the symptoms of autointoxication of the intestinal type. The absorption of the albumoses and the leucomaines give at least a part of the symptoms observed; these are products of proteid digestion which are not normally absorbed as such."

"In sixteen years' experience the writer has yet to find a case of chronic intestinal stasis without a related spinal lesion, demonstrated either as flaccid or tensed muscles and ligaments or bony maladjustments. And they always related to that area of the spine between the sixth dorsal and second lumbar. We have considerable laboratory proof that such spinal lesions have a detrimental effect upon intestinal function, and an abundance of clinical proof that the removal of such lesion almost invariably results in partial or complete cure."

—J. J. Pearce.

The mental depression is associated with flabby muscles, much after the fashion of the melancholia patient. The effect of the toxin upon the cerebral centers is not to be denied, yet there seems much evidence in favor of the view that the deficient nervous activity is also a cause of the intestinal state. The undoubted value of psycho-analysis in some of these cases is also indicative of the place of cerebral activity in the control of intestinal functions. The symptoms of autointoxication which so often follow depressing emotional states is well known. All of these variable etiological factors show that the control of intestinal activity is either a much more complicated affair than has been supposed, or that the true cause of intestinal autointoxication has not yet been discovered.



The autopsy findings include evidences of toxemia, affecting many organs. The intestines may be overfilled, in segments or generally; ulcers may sometimes be found in the small intestine.

**Diagnosis.** Only after every organic disease, anaphylaxis, intestinal infection and food poisoning with similar symptoms have been eliminated is a diagnosis of intestinal autointoxication justifiable. A too facile and faulty diagnosis of this condition may permit organic disease to progress to an incurable stage.

The symptoms are widely distributed. Constipation usually alternates with diarrhea, while the anorexia, nausea, foul breath, furred tongue persist with little or no remission. Flabby muscles, sallow skin, and emaciation are constant. Vague sensory disturbances, such as fleeting pains, rheumatic-like aching, formication, alternations of heat, cold, and prickly sensations, skin lesions, visual disturbances, tinnitus, and disturbances in taste and smell, are variably found. Vertigo and headache, sometimes resembling migraine, palpitation, cold hands and feet and varying blood pressure are characteristic. Insomnia alternates with bad dreams in some cases, while in others sleep is abnormally profound and of many hours' duration. Apathy and despondency may approach melancholia. Disturbed function of many organs of the body may be caused by the toxemia and the nervous reflexes, and organic disease may supervene.

The **physical examination** must be thorough, in order to eliminate organic disease. The thyroid gland is often slightly enlarged. The tongue is furred, the breath foul and often sweetish. There may be a hemic murmur, and the cardiac sounds are weak. Slight rales may be heard on taking unusually long breath. Slight or no gastric dilatation is to be found. The liver is slightly enlarged, and is found slightly lower than usual, under the depressed ribs. The spleen is sometimes enlarged. (Both liver and spleen may be tender and may ache like "ague cake," which has often led to faulty diagnosis of malaria.) Abdominal tenderness is usually present, not well localized, and varying daily.

The skin and underlying tissues are tender on palpation around the neck and shoulders, especially near the suboccipital regions, the tips of the shoulders, and the neighborhood of the transverse processes of the cervical vertebrae. The cervical muscles are hypersensitive, a condition much resembling torticollis may be present. An area of tension with tenderness is found in the neighborhood of the fifth to the eighth thoracic spines, extending outward over the heads of the ribs. This is usually the upper limit of a spinal maladjustment extending to the second lumbar vertebra or lower. Through this area the spinal column is unduly rigid, and the tissues are apt to be more or less analgesic and sometimes anesthetic. Rarely hyperalgesia is present through this area. Innominate

lesions and lumbo-sacral lesions may be present, and may be the primary cause of the dorso-lumbar lesions.

The **urine** shows excess of indican, the conjugated sulphates, and sometimes acetone. Albumin and casts and renal epithelium may suggest nephritis; the celerity with which the condition clears up proves the disturbance functional. There may be lessened sugar tolerance; small amount of sweets being followed by glycosuria; this, with the acetone and aromatic urinary content may suggest diabetes; here, also, the transient nature of the findings gives the diagnosis.

The **blood** shows the effect of the toxins. Atypical forms are found in each class of blood cells. Both red and white cells are often fractured. Eosinophilia may be marked; amphophiles and basophiles are occasionally found. Nuclei may be extruded; nuclear masses may be plentiful.

A teaspoonful of powdered charcoal should be given, with food, and the time recorded. The first appearance of a black color in the feces should be recorded, and then the time when the black color disappears from the feces be recorded. This gives the time relations of the intestinal passage. The X-ray is much more exact.

**Treatment.** This must be based upon the factors found important in the etiology of each case. Special attention should always be given to the ascending colon and the sigmoid.

Bony lesions must be corrected. The required corrective treatments should be given briskly, in such a manner as to stimulate the sensory nerve endings in the articular tissues and the deeper muscular layers along the spinal column and around the heads of the ribs. The ribs should be raised and held for the space of one to three long, slow breaths. Nearly all corrective treatment usually indicated in this condition may be given in such a way as to compel forced and deep respiratory movements; these are excellent.

The patient should be taught correct posture, such exercises as his individual peculiarities demand, and correct breathing habits.

When investigation indicates repressed emotional states, some of the methods used in psycho-analysis are indicated.

Purgatives must be absolutely discontinued. The colon should be kept clean by enemas; this constant removal of passages from the small intestine, with very much increased water drinking, are all that the ileum and jejunum require in the way of laxative treatments, provided adhesions are not present.

"Latterly I have been using bowel irrigations in these cases—with or without fasting—varying in frequency from once in two days to three times each day. Six to fourteen quarts of water are used; if there is colitis, as is usual, the water is slightly soapy. In all these cases the great essential is the adjustment work in the dorsal or lumbar areas. Fasting and irrigation are necessary for anything like rapid recovery. Results are very gratifying."—G. W. Riley.



After a fast, a rigid milk diet, or rigid fruit diet, or some other rigid diet chiefly of water and associated with rest and other indicated treatment, should be given until the toxic symptoms abate. The juice of lemons, limes, grape fruit and pineapple greatly diluted are excellent.

After the body seems clean, the return to a mixed diet must be made cautiously. Whatever class of food has been taken in excessive amounts before and during the onset of the toxic symptoms, should now be almost or quite omitted from the diet for a long time. The patient must never return to an unbalanced diet. Probably he will need more cellulose and raw foods, and more liquid, than do normal persons for months or years after the attack, in order to prevent recurrence.

With return to mixed diet, an attempt must be made to increase the fat and the muscular tone of the body. Systematic exercises, both mental and physical, are important. Since the condition is often of slow development and itself causes mental depression, the reëducation of the patient is a necessary element in promoting the most rapid recovery.

**Prognosis and Sequelæ.** The toxemia predisposes to certain functional and organic diseases. Hysteria and the neurasthenic states, anemia, arterio-sclerosis, interstitial nephritis and cirrhosis of the liver, may be mentioned, to say nothing of the effects upon the life of the patient of the mental habit of apathy and torpor. With suitable treatment and reëducation, many of these after-effects can be avoided. Recovery is to be expected as long as the intestinal autointoxication remains uncomplicated by organic disease, provided the patient is obedient to the instructions and is willing to receive the treatment indicated for the weeks or months necessary to complete restoration to correct bodily structure and cellular metabolism.

## CHAPTER VI

### DISEASES OF THE INTESTINES—(Continued)

#### GASTRO-ENTEROPTOSIS

(Glenard's disease; asthenia generalis; splanchnoptosis; visceroptosis; visceral prolapse)

This is unfortunately a rather common condition. It is a downward displacement of the stomach and intestines, usually including the stomach and the colon, often the small intestines, the right kidney and the spleen. The colon frequently hangs into the true pelvis; the pyloric end of the stomach may also be found in the true pelvis.

**Etiology.** The causes are congenital and acquired. Imperfect development of the supporting ligaments and of the muscular walls of the viscera and of the abdomen, with or without a general bodily weakness associated with a tendency to kyphosis, are the most common congenital causes. Of the acquired causes, two chief classes may be recognized: weakness of the muscles and ligaments, and increased weight of the viscera.

Weakness of the supporting tissues has as its chief, or as a contributing cause, some abnormal spinal condition, either a kyphosis, which may act mechanically or as a bony lesion, or the less conspicuous subluxations. Faulty postures act in the same way. These practically always include a rigidity of the lower thoracic or the dorso-lumbar spinal column and a dropping of the lower ribs, with lessened mobility of the lower chest wall. Congenital absence of the tenth costal cartilages is frequent. The upper chest is depressed, the shoulders thrown forward, the neck anterior, the diaphragm weakened, and its central tendon shortened. Other causes of weakened tissues are improper clothing, especially tight or ill-fitting corsets; repeated pregnancies or hydramnios; ascites; sudden loss of too great fat, and urgent muscular strain, such as heavy lifting, etc. Certain constitutional diseases, as chlorosis, tuberculosis, or any other mal-nutrition may so weaken the tissues as to permit prolapse. Neurasthenics, epileptics, and others with obscure nervous diseases suffer almost constantly from enteroptosis. It is not always easy to determine whether the ptosis is a cause or a result of the neurosis, or whether both neurosis and ptosis are due to some preëxisting cause.

The causes of too great visceral weight are many: constipation; dilatation of the stomach and of the colon; congestion of the liver and of the spleen or tumors of any of the viscera. Chronic



inflammatory processes may add to the weight of the viscera and weaken the supporting tissues at the same time.

**Diagnosis.** The main symptoms are abdominal distention, pain after eating, eructations of gas, anorexia, various nervous phenomena, weakness, constipation, and in some cases the symptoms of intestinal stasis. There are symptoms of a more or less marked neurasthenia in young persons. The condition may be present in an extreme degree without causing any symptoms in some persons, especially in women after repeated pregnancies.

The spine shows some lesion from the seventh thoracic to the third lumbar vertebræ. Rigidity is almost constant. A general posterior curve, more rarely an anterior curve, is present. The lower ribs are always depressed. There may be considerable tenderness of the lumbar muscles. Superficial muscles often are atonic, while the small deep spinal muscles are irregularly contracted.

In the standing position, the abdomen protrudes and the upper part sinks in; when lying, the abdomen shows a lateral extension. Palpation often finds a ridge lying across the abdomen, and aortic pulsation is frequently seen and felt.

The X-ray gives very clear-cut information as to the extent of the ptosis. By this means it has been found that many of the intestinal disturbances are associated with varying degrees of ptosis, and that the amount of perversion is much greater than was formerly supposed.

The urine is usually loaded with indican, and various related substances resulting from putrefaction may be present.

The blood shows the effects of toxic influences. The red cells are variously deformed and are sometimes granular; the eosinophiles are slightly increased; the polymorphonuclears are usually not increased, but show various atypical characteristics—irregular staining reactions, vacuolization of protoplasm and nucleus, tendency to fracture, and to extrusion of the nuclei. On the warm stage the white cells move sluggishly and cease moving quickly.

In middle-aged and young persons the blood pressure is usually lower than normal; no doubt the inefficiency of the circulation is one factor which, by adding to the weight of the organs, causes the ptosis. On the other hand, the ptosis, by disturbing the pressure relations of the large veins, in itself tends to the accumulation of blood in the mesenteric vessels. It is probable that the low blood pressure is both a cause and an effect of the ptosis.

When the lower half of the abdomen is supported by the hands or by a wide belt, great relief is felt. (Glenard's belt test.)

**Treatment.** Correction of the vertebral, costal and innominate subluxations is of first importance. General abdominal manipulations are sometimes indicated. Manual raising of the colon may be useful; a proper support should then be arranged for temporary

relief. Treatments should be given every day or every two days for one or two weeks, then once or twice each week until lesions are fairly well corrected. After this, the patient should return for examination and whatever treatment may be found to be needed once each month or two months, for a year, if possible.

There are several **diets** recommended. The all-cellulose diet of salad vegetables and the more fibrous of the cooked vegetables, with bran bread, aims to produce bulk and thus to increase peristalsis. Thin patients receive increased amounts of fats, must rest after meals, and be made to gain in weight. Obese persons must be reduced (see obesity).

The farinaceous diet aims to diminish the bulk of the food residue as much as possible. The low proteid diet is given in order to reduce putrefaction.

Systematic exercises are required to strengthen the weakened abdominal and other muscles and establish correct posture with correct habits of breathing. Having the patient remain in the knee-chest or Trendelenburg position as much as possible, assists in keeping the colon in place. The left lateral, or Sims' position, is more comfortable, and should be made the habitual posture for sleep and rest.

"The following exercises are especially beneficial in visceroptosis:

"1. Walking on the hands and feet with the knees stiff. This is a rather awkward movement to master at first and resembles the ambling gait of a bear. Its advantage is very evident in that the hips are so much higher than the shoulders. This permits the viscera to fall upward and forward and utilizes gravity to help correct the condition it has assisted to produce.

"2. The patient lies on the back and with the hands on the hips, elevates the legs to a perpendicular position. The shoulders, or rather the dorsal spine instead of the hips, are made to support the column. With the legs in this position, a twisting motion is then made at the waist.

"3. Again in the recumbent position, the legs are raised to a perpendicular position first, and finally the body is flexed until the feet touch the floor back of the patient's head. The object of all of these movements is very evident. They change the position of the viscera, tend to loosen any adhesions that might be present and place them temporarily at least in a more normal position."—W. S. Nicholl.

"I instruct him to pull the abdomen up and in, every night and morning after retiring and before arising, when lying flat upon the back with the knees flexed, by placing his hands in the iliac fossæ and raising the viscera. The assistance of forced exhalation will aid materially. This exercise should be kept up for four or five minutes or until the patient is fatigued. Then at other times various exercises, such as bending forward and sidewise, may be used.

"In our opinion, an exercise of greatest aid is the one of forced exhalation. Have the patient stand erect, breathing normally, then pucker the lips and exhale gradually and forcefully for as long a period as possible; this brings the forced muscles of exhalation into use and domes the diaphragm, giving greater upper abdominal space. When exhalation is taking place, have him forcefully elevate and retract abdomen. This exercise, if carried out several times a day and faithfully continued for weeks, will have a pronounced effect in replacing and toning the viscera."—McConnell.



Mechanical supports may act beneficially by establishing more correct habits of breathing and posture, and by holding the colon in place. These give the patient a sense of relief, and this is a constant reminder for him to elevate and retract the abdomen. Success is dependent upon the patient's coöperation. Various corsets and supports are on the market but a cotton binder answers very well. They may be fitted before a fluoroscope.

The elimination of drug habits is one of the important factors in treatment. So many of these patients have been habitually taking cathartics, and have so great a horror of being left without them, that this is sometimes one of the hardest things to do in the way of treatment—while it is at the same time one of the most important.

**Prognosis.** This depends upon the possibility of removing the causes of the condition, upon the patient's coöperation in the way of diet, exercise, etc., and in the avoidance of purgative drugs. The spinal and lower rib lesions being corrected, and the patient giving even moderate obedience to the instructions, the prognosis is good for practically a normal abdomen, when there has been no actual destruction of the supporting tissues. When the injury is too great, or when old age or congenital weaknesses of the patient prevent a good prognosis, a suitable support must be worn indefinitely.

### ACUTE DILATATION

(Enteroplegia)

Acute dilatation is an expanded portion of the intestine due to acute obstruction or some cause producing a local paresis, or to a congenital weakness; producing sometimes an obstinate constipation and in other cases a gaseous distention with pain and colic.

**Etiology.** Acute obstruction, either from foreign bodies, adhesions, volvulus, or hernia is the most frequent cause. Of the general causes may be mentioned local or systemic infection; gastro-intestinal paralysis due to toxins circulating in the blood stream; trauma, as blows on the abdomen or falls; general anæsthesia; nervous influences; prolonged handling of the intestines or their exposure to the air during abdominal operations.

**Diagnosis.** The symptoms and treatment are those of acute obstruction and are considered under that head.

Gaseous distention of the intestinal tract may cause serious embarrassment of the heart and lungs.

### CONGENITAL IDIOPATHIC DILATATION OF THE COLON

(Hirschsprung's disease)

This is an anatomical anomaly of congenital origin leading to a looping of the colon. Muscular aplasia leads to dilatation and valve formation.

**Diagnosis.** The condition may not become manifest until adult years. There is an obstinate constipation with now and then attacks of diarrhea when enormous quantities of feces are voided. There is a history of a distended

abdomen from early infancy. The abdomen may become enormously distended. The patient becomes emaciated and the abdominal veins are dilated. The recti muscles may be separated. There is no abdominal pain or tenderness and vomiting is rare. Borborygmus is often very loud. The urine shows increased indican.

The treatment is usually surgical. Relief is dependent upon the physician's ability to establish fairly free elimination. This condition does not cause death, but renders the patient more susceptible to infections and the ill-nourished condition indicates a grave prognosis.

### CHRONIC DILATATION

Chronic dilatation begins insidiously from partial obstruction of the lumen from cicatrizing processes of the walls, new growths, compression or traction from without as of tumors, healing peritonitis, or coils of intestine loaded with feces. The symptoms and treatment are those of chronic partial obstruction.

### ACUTE INTESTINAL OBSTRUCTION

(Intestinal stricture; intestinal occlusion; ileus)

Acute obstruction is the condition resulting from various causes whereby peristalsis cannot move the fecal mass beyond a certain point; the main symptoms are about the same in all forms, varying somewhat according to the location and other conditions present in different cases.

The causes are grouped under eight heads, namely:

1. Accumulations within the bowel of hardened feces (fecal impaction), or foreign bodies of various sorts which have accidentally been swallowed, or gall-stones.

2. Strictures which are the result of cancer, ulceration, cicatrices or spasm. Congenital stricture is rare. Atresia ani is its most frequent representative, though congenital strictures are found almost at any point of the intestinal tract.

3. Pressure against the bowel from peritoneal adhesions, tumors, or abnormal growths.

4. Strangulations due to the slipping of the bowel or omentum through the openings of the various forms of hernia.

5. Invagination or intussusception when one portion of the bowel slips over another part, most common in children.

6. Twisting, rotation or volvulus.

7. Paralytic obstruction is due to paralysis of the intestinal muscle; the fecal mass accumulates and dilates this portion, thus causing the obstruction. It may result from inflammations, from the handling of the bowel during abdominal operations, or from toxins, as in uremia, typhoid or pneumonia; or from referred irritation, as in renal colic, gall-stones, inflammation of the testes, injury to the spinal column.

8. Spasmodic contraction of the circular muscle fibers may simulate ileus. It has been produced experimentally in anesthe-



tized animals by suddenly produced bony lesions, by handling the intestine, and by the application of heat, electricity or chemical irritants directly to the intestinal wall.

Of these strangulation is the most frequent in adults; volvulus in children. Meckel's diverticulum is a remnant of the omphalo-mesenteric duct, an embryonic structure which should be atrophied in very early life. When it persists, as occasionally happens, it usually has its peripheral (navel) end free, but sometimes this remains attached to the abdominal wall, making a loop through which the intestine may pass and become strangulated. Loops of intestine may also pass between adhesions of various classes, as those at the site of old inflammatory processes; or around the pedicle or a tumor, or into peritoneal pouches in a number of different ways.

Hernia is the condition which occurs when a loop of intestine passes into any opening or pouch—in external hernia the intestine protrudes without the abdominal wall; in internal hernia the loop passes into any of the narrow passages already mentioned, or others of similar relationships.

At any time, a hernia may become strangulated. In such a case the diagnosis is easy for external hernia, obviously, but may be extremely difficult in internal hernia.

The cause of death in acute total obstruction seems to be the presence of some poisonous substance elaborated in the small intestine, and normally passed into the lumen of the bowel. In total obstruction, this substance is absorbed into the blood, and the whole body poisoned. When even slight intestinal movements occur, this poisoning does not appear, even though the retention may appear to be complete. When no defecation occurs for two weeks or even more, from other causes, the symptoms may be comparatively slight; but when there is total obstruction for as many days the symptoms are severe and death seems to be at the door; life is rarely maintained more than a week after the condition is recognized, unless relief is secured. The higher the obstruction, the more speedily death occurs.

**Diagnosis.** The symptoms are almost pathognomonic.

Pain sets in abruptly; it is usually intense, at first paroxysmal, then becoming continuous; it is located in the middle line above the umbilicus if the obstruction is in the small intestine; and descends into the hypogastrium if the large intestine is involved. Constipation is absolute, though feces may be passed or removed by enemas from the bowel below the obstruction. Vomiting is first of the stomach contents, later of bile-stained material, finally of brownish fluid with a fecal odor. Abdominal distention is uniform unless the obstruction is high up but the flanks do not bulge. Paroxysmal peristaltic movements are visible through the abdominal wall around the umbilicus if the obstruction is in the small intestine; if low in the colon, peristalsis is seen along its line, the waves moving from right to left.

Tumor may sometimes be felt in malignant stricture. In intussusception, a sausage-shaped tumor may be found in the right iliac fossa or in the line of the colon.

Occasionally in infants the obstruction and the ileo-colic valve may be felt upon rectal examination. Blood may be passed by bowel and tenesmus is often marked. The general symptoms are those of collapse, indicated by pinched face, cold sweat, small

rapid pulse, dry tongue, scanty urine, great thirst, and either normal or subnormal temperature. Death from asthenia or peritonitis occurs from the third to the sixth day if relief is not secured.

The blood changes are marked. Leucocytes rise rapidly to about 16,000 per c.mm. when the bowel is partially obstructed; to 20,000 with complete occlusion. When the leucocytes rise to over 20,000 within first 24 hours, the chances are in favor of gangrene. Leucocytosis of more than 80,000 has been reported.

The X-ray gives accurate information concerning the location of the obstruction, and often of the nature of the lesion.

Examinations per rectum et vaginam and the exploration of hernial orifices may give useful information. Fecal vomiting occurs earlier in the higher obstruction.

Large injections of water may determine the capacity of the colon and hence something of the site. This is best given in the knee-chest position, the Sims position, or with the patient's hips elevated and the thighs flexed upon the abdomen. Such an injection may straighten out intestinal distortions or help to push a tumor, etc., into better position, thus removing, temporarily at least, the obstruction.

**Treatment.** Some therapeutic methods are common to all forms of obstruction; others depend upon the nature of the obstruction.

A few cases will respond to very careful work with the patient in the knee-chest position.

It is always best to have an experienced surgeon in consultation if possible.

In all cases purgative or emetic or analgesic drugs are absolutely contraindicated. Death may be hastened, or recovery prevented after the removal of the cause of the obstruction, by the early use of the so-called "home remedies," which may include almost anything from castor to croton oil and blue mass. Enemas should be used to cleanse the lower bowel. Ice in the mouth relieves thirst; the water should not be swallowed. Heat over the abdomen relaxes the muscular walls, relieves pain, and sometimes gives sleep and rest. Gastric lavage may be used freely.

Such spinal treatments as are indicated on examination often give marked relief. Reflex muscular contractions are found in the areas of spinal muscles which are in closest central connection with the sensory nerves from the intestinal areas of greatest irritation, but do not necessarily refer to the area of obstruction. The relaxation of these muscles gives comfort. After the removal of the cause the spinal treatment hastens recovery.

In surgical cases, the earlier the operation the better the prognosis. It is very necessary to save time in such cases, even at the expense of some weariness to the patient.



Other methods of treatment apply chiefly to special forms of obstruction.

**Fecal impaction** is diagnosed from the other obstructions by the gradual onset, the absence of hernias, and the presence of an irregular "doughy" mass following the line of the colon.

**Treatment.** Stop all purgatives—most of these patients are in the habit of using them. If the rectum cannot be cleansed by enemas, the rectal scoop or manual removal must be used. If the mass is higher, enemas of warm oil will help soften the mass so it can be removed by using plain warm water, or soap suds. In some cases, surgery may be necessary. Avoid manipulation until the masses have been softened; the dry, hard, adherent masses may injure the intestinal walls.

The **prognosis** is favorable for recovery. Recurrence is to be expected unless the original cause is removed.

**Strangulated hernia** is the form most often found needing urgent relief. The predisposing causes are sudden, heavy lifting; constipation, and rapid fat formation.

The symptoms are sudden pain in and around the hernia; violent and colicky pains around the umbilicus; the tumor becomes larger, is tender, painful and dull on percussion and without impulse on coughing; the intestinal wall becomes edematous; uncontrollable vomiting comes on early; prostration increases to collapse; the pains become more violent; the pulse is small, irregular, rapid and may be very weak; the temperature is normal or subnormal (sometimes a slight fever is present at first); and the Hippocratic facies is characteristic. When gangrene begins, the vomiting ceases, pain abates, hiccoughs appear, the pulse becomes very frequent, feeble, and intermittent; collapse deepens and delirium is common.

**Treatment.** The first thing is to attempt reduction. Put the patient upon his back with the hips elevated, the thighs flexed upon the abdomen, rotate the leg upon the affected side slightly inward to relax the tissues around the inguinal rings. Apply taxis or gentle manipulation using such methods as the location indicates to replace the bowel (or omentum). Reduction is evidenced by the sudden slip from the hand or an audible gurgle as the loop enters the abdomen. Taxis must never be employed in cases of great acuteness; in cases where the strangulation has existed for several days; in cases known to have been previously irreducible; in cases with stercoraceous vomiting, or in cases with inflamed or gangrenous hernia. If taxis fails, operate as speedily as possible, first trying reduction under ether.

After reduction, put the patient to bed; apply a pad and bandage; allow no food until vomiting ceases, allowing a little hot

water for 24 hours, and keep on liquid food for several days. At the end of the first week begin to give solid food.

If the bowels do not move after four or five days, a small enema may be gently given. This may be repeated daily until defecation occurs normally and the regular diet is permitted.

Before leaving the bed, a truss should be fitted. The best treatment for hernia is surgical repair, unless there is some contraindication.

**Prognosis.** The prognosis must be guarded until the normal digestion has been reestablished.

In **intussusception** a history of purgation, diarrhea or other form of intestinal irritation, or of precedent symptoms indicating ulcers or polyps will probably be found. The patient is usually a child.

Occasionally the invaginated portion may be sloughed off, the upper edge of the rings adhere, and the patient may recover spontaneously by this natural surgery. Such a termination must be very rare, however. The slipping of the ileum into the colon is perhaps the most common location.

**Treatment.** The patient should be placed in the Trendelenburg, the Sims, or the knee-chest position. Warm oil or soapy water should be slowly injected into the rectum, under low pressure, while gentle manipulations are given over the abdomen. An assistant may give deep, steady pressure over the spinal regions of greatest muscular tension; this lessens the pain of the manipulations. If there is difficulty in securing the reduction, the pressure of the injecting oil or water is increased, hot cloths applied over the abdomen around the site of the manipulations, and the position of the patient changed. After reduction has been secured, the patient should be kept in bed on a liquid diet, for several days.

If reduction is impossible, surgical aid should be secured speedily—certainly within twenty-four hours if possible. The longer the operation is delayed the less hopeful is the prognosis.

**Volvulus** is a condition thought to be caused by excessive peristalsis caused by unequal filling of the coils or by contusions especially acting upon intestines with an abnormally long mesentery, thus producing a more or less completely obstructed bowel by a twist or kink about its long axis. One half of the cases occur in the sigmoid flexure. Males between thirty and forty years are most often affected.

**Treatment.** Direct treatment to the affected area is here indicated but it must be carefully done. Spinal treatment controls the blood and nerve supply, lessens the pain, and tends to establish a normal peristalsis and secretion throughout the intestinal region.



Surgery is immediately necessary unless the condition can be removed within a few hours.

The **prognosis** is grave, as in all forms of obstruction. Recoveries occur.

**Strictures** are almost invariably surgical, and are speedily fatal unless removed. Occasionally such conditions can be temporarily relieved by manipulation and enemas, but these methods are rarely of permanent value. The removal of the injured section of the intestine is the usual surgical procedure. The prognosis in all cases depends upon the nature of the cause.

**Peritoneal adhesions** are sometimes stretched by manipulations applied directly over the adherent bands, thus relieving the tension. It is necessary to use great care, lest inflammatory reaction and the adhesions be thereby increased. In such cases treatment must be continued at rather long intervals for months, in order to prevent recurrences. When the condition is complicated by tumors, these may or may not be removed, according to the benignancy, location, and size of the tumor in each case, and the physical condition of the patient.

**Paretic Obstruction.** When a segment of the intestinal wall has become paralyzed the best treatment is rest. Daily enemas for the removal of the lower feces, sometimes rectal feeding, gastric lavage, alternate hot and cold applications to the abdominal wall, and the spinal corrections indicated on examination, give best results. If the symptoms do not abate, the removal of the injured segment of the intestine is indicated.

**Prognosis.** In all cases of intestinal obstruction the prognosis must be guarded, not only for recovery from the acute attack but also for recurrence.

**Chronic obstruction** is that condition of gradually increasing closure of the intestinal canal most commonly due to malignant growths. Gradually increasing and hardening fecal masses, and the slow contraction of cicatricial bands are also etiological factors. Enteroliths and foreign bodies are rarely causes of chronic obstruction.

**Diagnosis.** There is a history of gradually increasing constipation alternating with diarrhea perhaps, abdominal pain and distention and general failure of the health. There may be recurrent threatenings of acute obstruction until finally there is complete occlusion, symptoms of acute obstruction, and death.

The feces are narrowed in character, of pipe-stem shape, flattened like a tapeworm, or composed of small, rounded masses like sheep's dung, frequently smeared on the surface with blood and pus. Portions of tumors are sometimes found.

Abdominal palpation and inspection, with the rectal and vaginal examinations, may locate the growth, adhesive bands, or fecal masses.

X-ray, after giving bismuth or other suitable enemas, shows the place of interference; the nature of the cause of the occlusion may often be inferred from the X-ray plate.

**Treatment.** Most thorough and careful examination must be made to determine the location of the growth. Surgery offers the best hope for permanent relief. If non-operable, careful regulation of the diet, with enemas and spinal work to alleviate the pain, is palliative. Fecal concretions must be softened, sometimes by days of successive oil, saline, and soap enemas.

Adhesive bands may sometimes be benefited by stretching. Injury to the intestines must be avoided. Surgery for these is of dubious value; if the bands can be cut without the formation of later adhesions, this leads to permanent recovery from the condition. Unfortunately, such operations are too often followed by the formation of other bands, perhaps more harmful.

**Prognosis.** This depends upon the possibility of removing the obstruction. If this cannot be removed, death is quickly inevitable; if the obstruction can be removed completely, recovery is speedy and practically complete. Between these extremes lie all gradations of prognosis.

**INTESTINAL TUMORS.** Carcinoma is the most important intestinal neoplasm. The symptoms are those of chronic obstruction, with cachexia. Rarely the obstruction may first appear in the acute form; in other cases the first symptoms are those of perforation.

Rectal tumors may be either adenoma or epithelioma. They are often branched and of delicate structure, so that masses of the growth may be passed with the feces; bleeding is apt to occur.

In the duodenum, the ileo-cecal region, and the rectum polypoid growths may occur. These probably originate from shreds left from old inflammatory areas; they are composed chiefly of mucous glands in a connective tissue network. Their growth may result in various types of obstruction. When they are so attached as to act like a ball valve, the resulting symptoms may be most confusing. In the sigmoid area the symptoms may be those of a spastic colitis. Care should be taken to avoid confusing colitis and a possible diverticulum.

Connective tissue tumors usually grow into the peritoneal cavity, and cause little or no disturbance. Rarely, tumors either within or without the intestinal cavity may cause irregular symptoms of intestinal irritation, with colicky pains and griping, but with no evidences of organic disease. Such cases are apt to be diagnosed as intestinal neuroses.

Many of these are recognized or suspected only post mortem. Those which cause occlusion can be treated surgically if at all.



## CHAPTER VII

### ENTERITIS OF CHILDREN

The intestinal inflammations of children have practically always a more or less pronounced "nervous" basis; rarely a purely "nervous" diarrhea is present, and this does not result in true enteritis unless the imperfectly digested food acts as an inflammatory agent. Considering the nervous element always present, three classes of acute infantile enteritis are to be recognized: irritative, fermental, and infectious. These differ in etiology, diagnosis and treatment.

The possibility that vomiting and diarrhea may be symptoms of disease of the central nervous system or of the kidneys must not be forgotten. The examination of the pupils and of the various reflexes should eliminate the first; the microscopical examination and chemical tests of the urine should eliminate the second possibility.

#### ACUTE IRRITATIVE ENTERITIS OF CHILDREN

(Nervous indigestion; intestinal intoxication; acute dyspeptic diarrhea)

This is a catarrhal enteritis in children, due to improper intestinal content, and characterized by vomiting, colic, and diarrhea. This form is usually comparatively mild and is self-limiting. The diarrhea and vomiting eliminate the offending material, and recovery usually occurs spontaneously within two days. When the etiological factors persist, and in certain other circumstances, the disease passes into more serious forms.

**Etiology.** The predisposing causes include poor nutrition and habitual use of improper foods; teething; insanitary surroundings; previous attacks; climatic changes; nervous irritability, due to bad inheritance and to the presence of irritable mothers and other adults. Bony lesions, including the spinal column from the mid-thoracic to the coccyx, may be either primary or secondary. The lower thoracic and lumbar area are most often involved. Lower rib lesions are usually secondary.

Exciting causes include the use of improper food, food given at improper times, or of too great quantity; sudden change of diet; sudden change in temperature; emotional storms; fatigue; loss of sleep—anything which disturbs either the quality of the intestinal contents or the physiological balance of the intestinal nerve centers. An important factor often neglected is the spinal shock resulting from the falls and strains to which children learning to walk and those playing with one another are especially subject.

**Diagnosis.** The trouble begins abruptly with nausea and vomiting several hours or days after the disturbing diet. Rumbling noises in the abdomen usually precede the evacuations and considerable gas is passed. There are colicky pains, moderate tympanites, and diarrhea. The child is irritable, sleeps poorly, and convulsions may occur. The fever is rarely high, 102° to 105° F. in infants, 103° F. in older children. The pulse is rapid and prostration is marked in the very young or weak child. Stools are four to twelve or more in twenty-four hours, at first normal in color and odor for the diet used and the age of the child. Later they are liquid in character and contain undigested whitish masses. No blood or excessive mucus is present in the early stages unless there had been extreme irritation in the diet. There is no persistent fever, no toxemia. The child does not look sick. In prolonged cases there may be seen excessive mucus and flecks of blood due to a subsequent colitis. Convulsions may precede or accompany the diarrhea.

**Treatment.** This depends much upon the age of the patient but the general principles are the same. Empty the bowels as soon as possible by enema and gentle manipulation. Gastric lavage is useful during the early stages or if vomiting persists.

Withhold food, giving boiled water, whey, or albumen water for thirst, one to four teaspoonfuls at a time for an infant and at short intervals. If possible, give as much boiled water, or other liquid as mentioned, as would have been given of both food and water during the same period of health. If cool water causes vomiting, give it quite warm, as much as can be taken, in order to serve as lavage if not retained. It must be remembered that the diarrhea removes very large amounts of water from the circulation; this must be restored as rapidly as possible.

When water is persistently refused, the enema may serve. After the colon seems emptied of fecal material, a quarter to half pint of normal salt solution may be injected, and this will be retained for some time, especially if the buttocks are raised slightly. A variable amount of this water will be absorbed into the general circulation.

Frequent bathing for cleanliness and the reduction of temperature is necessary. A tub at 100° F. gradually reduced, is the best, using gentle friction during the five to twenty minutes of the bath. Fresh air is essential; as soon as the child can be moved, take him to the seashore or any place where he can have the best food and air.

The clothing should consist of a single loose garment. The child should be protected from sudden changes of the temperature by suitable coverings. Napkins should be removed as soon as



soiled, taken from the room and placed in a disinfecting solution or burned. Absolute cleanliness of the buttocks and genitalia with the free use of some absorbent powder as starch and boric acid will prevent excoriations.

Marked tension and hypersensitiveness in the spinal areas, especially through the mid-thoracic and lower thoracic region are constant; these recur, and must be relieved as frequently. Bony lesions may result from these reflex contractions. Correction of such perversions as they are found hastens recovery and lessens the danger of recurrences under slight provocation.

Convalescence is usually rapid in uncomplicated cases. Care is necessary to prevent too sudden a return to ordinary diet.

"In breast-fed babies, give boiled water during the period of withholding food. Then resume breast feeding and dilute by giving immediately before nursing a mixture of one teaspoonful each of boiled water and lime water. Allow nursing five minutes first time, ten minutes the second time, and then back to normal. In bottle-fed babies, withhold food twenty-four to forty-eight hours, then return to former diet, if it had previously agreed with it, by giving at first one fourth strength, then one half, then full strength feeding. If there is any indication of an ileo-colitis present, as excessive mucus and flecks of blood, give a daily irrigation of the colon."—J. H. Long.

"Some nervous children have convulsions. When these occur, wrap them in blankets wrung out of hot water or dip the child into tub of hot water with cold cloth on head. However, osteopathic treatment to cervical region usually takes care of this condition, unless in very severe cases.

"One of the most trying symptoms in these simple diarrheas is colic and griping pains. It is my experience that no method of treatment so quickly relieves it as osteopathic treatment to spine from eighth to tenth dorsal and gentle deep pressure over solar plexus. A hot water bottle may be applied to abdomen and epigastrium following treatment."—Nettie M. Hurd.

For older children the diet is much like that of infants at first. Later, meat broths, eggs, dried bread and milk may be given cautiously. Cereals, vegetables and fruit should usually be withheld for some time. The fruit and vegetable juices may then be given, and the regular normal diet resumed within a week or ten days.

**Prognosis.** In infants all diarrheas should be regarded with suspicion, though the simple forms usually pass away, as in older children, within a few days. Each attack predisposes to later attacks, more severe, with less marked causes. During an attack the child is more than usually susceptible to infections, especially of the intestinal tract.

**Prophylaxis.** The education of mothers in regard to the feeding and care of infants and older children, proper milk inspection and the enforcement of sanitary laws, and the occasional osteopathic examination of children would practically remove these forms of enteritis from the world.

**ACUTE FERMENTAL ENTERITIS OF CHILDREN**

(Choleric form diarrhea; summer complaint; cholera infantum)

Fermental enteritis is an acute inflammation of the stomach and intestines, characterized by severe colic, vomiting, purging, early high fever of short duration and marked prostration.

**Etiology.** Hot weather, especially with high humidity; too warm clothing; teething; improper food, especially bad milk, bad meat, or foods unsuitable for babies; and imperfect hygiene in general, are predisposing factors. Bony lesions are more variable than in the simpler diarrheas. Lesions of the cervical vertebrae are rather more frequent.

The exciting causes are usually dietetic errors. Sometimes no efficient exciting cause can be found; these cases usually occur in children whose hygienic and dietetic conditions are bad.

"To understand the condition present it is necessary to recall the kinds of bacteria normally present in the intestines and their actions. We find present in the intestines, first, the obligate fermentative organisms which live in a carbohydrate media and form products which are nontoxic; second, the obligate putrefactive organisms, which must have a proteid media in which to live and in the absence of which they soon die out. They act upon the proteids, splitting them, and form products which are toxic; third, the facultative fermentative organisms, which are normally present and as long as there is a carbo-hydrate media present they will live on it and the products formed are nontoxic, but when the carbo-hydrates are deficient, or when there are abnormal conditions present in the intestines they act upon the proteids and produce toxic substances. In cases where there is simply indigestion, or under influence of a change in the digestive powers, or abnormal chemical contents, or by feeding excessive proteids, the obligate fermentative organisms are inhibited in their growth and the facultative fermentative bacteria then act upon the proteids and produce substances toxic. This type of diarrhea is the most fatal and in some cases the toxemia is overwhelming, the child dying within the first twenty-four hours."—J. H. Long.

**Diagnosis.** The onset may be sudden or preceded by intestinal disturbance, then vomiting and purging occur with severe abdominal pain and high fever, 102° to 106° F. (the temperature should be taken by rectum as the body surface is cold). The pulse is rapid (130 to 160) and feeble; intense thirst may be a marked feature; distressing retching follows, and rapid wasting may be apparent within a few hours. The appearance is noticeable and characteristic. The body shrinks; the eyes are sunken and partly closed; the mouth partly open; the lips are dry, cracked, and bleeding; and the skin a peculiar ashy pallor. At first the child is irritable and restless, but soon becomes semi-comatose; the pulse becomes more and more rapid and feeble; the body-surface cold and clammy. The tongue is found heavily coated. The spinal muscles are found heavily contracted. There may be bony mal-adjustments. The stools are, at first, fecal, brown or yellow and very offensive, soon becoming thin, alkaline, serous, or watery and leaving a faint



greenish or yellowish stain on the napkin. They number from ten to thirty a day and possess a musty odor. The urine is diminished or suppressed. The pupils contract but are unresponsive to light; the stupor deepens; the fingers are clutched; there may be convulsions; the head may be retracted; respirations may be of the Cheyne-Stokes type; these last form the "hydreencephaloid" symptoms.

The termination may be by death from profound exhaustion or convulsions. In recovery, the symptoms gradually diminish and the disease passes into a slow, tedious convalescence.

**Treatment.** Careful and thorough spinal manipulation, relaxing and correcting as is indicated in the individual case, assists in eliminating the poisons and in restoring the normal functions. Empty the stomach and bowels by washing the stomach and by irrigating the bowels. Supply fluid to the blood if necessary, to make up for the very great drain of the discharges, by subcutaneous injection of at least a half pint of warm normal saline solution every twelve hours. If the case is not so serious, the Murphy "drop" may be sufficient.

Reduce the temperature by tepid sponging and by the ice cap to the head. Deep, steady pressure in the suboccipital fossa may reduce the temperature. Colonic flushing with cool water may be useful. If the temperature is subnormal, the hot water bottle, stupes, and fomentations are indicated.

Treat the various symptoms as they arise. For the abdominal pain, deep, steady pressure in the lower thoracic spinal area is indicated. Hot fomentations may help when applied to the stomach and abdomen. The early denial of all food is best. Barley water may be given in small quantity every hour to relieve the thirst. Very warm water sometimes relieves the vomiting.

The **lactic-acid diet** depends upon the bacteriology of the disease as given above. Skimmed milk is acted upon by any of the lactic-acid bacilli in a warm room for twenty-four hours; the "buttermilk" thus formed is fed to the child according to age, at intervals of two to four hours. Three to eight ounces are given at each feeding. This method gives very good results, in the experience of certain physicians. In any case, return to the ordinary diet must be cautiously made.

Change of air is one of the usual recommendations.

The child must be guarded from nervous excitement for several weeks after an attack.

**Prognosis.** The condition is grave in all cases. Death or convalescence or a change to a less acute form usually occurs in from one to four days. Recurrence has a graver prognosis.

**ACUTE INFECTIOUS ENTERITIS OF CHILDREN**

(Catarrhal ileo-colitis; ulcerative enteritis or entero-colitis; follicular enteritis; inflammatory diarrhea)

Infectious enteritis affects the lower portion of the ileum and involves the colon also; it occurs usually in children under two years of age, and is characterized by vomiting, persistent and irregular fever, and marked prostration. Blood and quantities of mucus appear early in the stools.

**Etiology.** The predisposing causes are hot weather, debility due to teething, and improper feeding. The usual bony lesions include chiefly the lumbar spine, especially a rigidity of this area. The spinal condition is certainly an important predisposing factor.

The exciting causes are the pyogenic cocci or the bacillus dysenteriae of the Shiga or Flexner type.

The pathological changes are found in the epithelium of the mucosa of the ileum and colon, the infiltration of which may be so great as to affect the submucosa with the production of necrosis and the formation of ulcers.

**Diagnosis.** In mild cases there is a diarrhea of greenish, offensive stools which may contain undigested casein in curds like "chopped spinach," numbering from fifteen to thirty in twenty-four hours; abdominal pain causing great restlessness and irritability; fever of slight degree; and vomiting. The tongue is furred and moist at first, later becoming red and dry.

In cases of moderate severity the onset is sudden, often with vomiting, abdominal pain, and fever, 102° to 104° F. at first; later, 99° to 102° F.; and frequent, thin, green or yellow stools which are partly fecal and partly undigested food. Later, the discharges contain mucus and blood, rarely in clots and usually streaking the mucus. The stools are almost odorless. The appetite is lost and the tongue is coated. Prolapsus ani is frequent. There is considerable prostration and marked loss of weight. The convalescence is slow and begins about a week after the onset of the disease.

In severer cases the symptoms suggest bacterial intoxication. Vomiting and diarrhea are urgent; the abdomen distended or hollow, and very tender; the temperature 104° to 105° F.; wasting is rapid, and collapse and coma may cause death in a few days.

**Treatment.** "Relaxation of the contracted muscles by strong deep pressure brings to our assistance the normal inhibitory function of the splanchnics. Gentle springing of the spine also seems to help in freeing the contraction. A general spinal treatment is indicated in these bowel conditions, as the whole vasomotor system is deranged as evidenced by the cold face, chest, abdomen and extremities, hot back and congested mesenteric vessels. Of course,



the spinal bony lesion must be corrected, but just when in the course of the disease it is wise to attempt this, I believe depends on the vitality of the child and the severity of the condition. \* \* \*

"Sometimes I place the child on its chest on my lap or on its bed and extend the legs, gently pressing on spine, moving pressure on spine, moving pressure with each elevation of the legs with some lateral bending of the spine at the same time. \* \* \* The Old Doctor says take the child in your lap and have him throw his arms over your shoulder, then begin at the fifth lumbar and adjust from the fifth lumbar to the occiput, remembering that it is a child you are handling and knowing well that it requires but little force to adjust and loosen up the entire spine."—Nettie M. Hurd.

Raising the lower ribs, holding them for the time of one breath, is helpful. With the child held by the right arm around the upper part of the body, the left hand may raise the child's right ribs; then, with the left arm holding the child's body, the right hand may raise the left ribs. Spinal treatment may be given with the child in the same position. It is sometimes possible to give such treatments standing, when the child would cry and struggle if the attempt is made to hold him upon the lap. Every effort must be made to prevent struggling; the nervous effects may be profoundly depressing. In a few cases, if the pathology permits, deep but very careful work over the abdomen is effective.

**Diet.** All milk foods, of whatever kind, must be stopped at once. Barley water, rice water, may be given in the amounts and at the times of the usual feeding. A small amount of chicken or other broth may be added to make these palatable, if necessary. Sugar is permissible also; indeed, sugar is often advised in order to give the necessary fuel for the needs of the body, thus preventing too great loss of weight from the high fever. As convalescence progresses, the return to ordinary diet must be cautiously made, watching the effect of each change and keeping the bodily structure of the child always under close supervision.

Let the child wear a single, loose garment. Napkins or pads of soft cloth should be placed under the buttocks, and these removed as often as soiled; sores are apt to occur if cleanliness is not constant. The soiled cloths should be burned or else immediately dropped into some antiseptic solution, to be boiled later, before being used again. Since the fecal material contains the infectious agents, the utmost care must be used to prevent reinfection of the child, or the infection of others.

A flannel band or pad over the abdomen is often advised. Warmth is usually required; a small hot water bottle over the abdomen may relieve the pain. Hot stupes may give more speedy relief, carefully avoiding chill in changing.

For several months after such an attack the fats must be kept down to a minimum. Olive oil may sometimes be used when milk fats are not well handled.

**Colon irrigation** is useful. When there is profuse diarrhea this washes out the irritating material, cleans the membrane, and permits more rapid recovery. The normal salt solution should be quite warm—105° to 110° F.—and should be thoroughly given at least once. If no good effects are noted, or if the child struggles and cries when the procedure is properly carried out, it need not be repeated. Usually this warm irrigation diminishes the pain and the peristalsis, and gives opportunity for several hours' rest. Too frequent use of the enema or irrigation is to be avoided—twice a day is the most that is allowable, except in exceptional cases. There is no reason for attempting to insert the tube a long distance—the reversed peristalsis carries the fluid well around to the cecal region, and sometimes into the small intestines, through the relaxed ileo-cecal valve.

When the irritation of the colon is profound, as when much blood and mucus, and violent straining, are noted, thin boiled starch solutions may be injected. Thin flaxseed solution is also used. These act as a mechanical protection to the wall of the colon, and are very soothing in most cases. The old-fashioned starch-and-laudanum mixture is dangerous, on account of the possibility of the absorption of the laudanum.

**Gastric lavage** may be necessary if the vomiting is severe, especially during the first few days. It should not be used unless there is reason to believe that irritating substances are still present in the stomach. The washing that is secured by the vomiting of considerable amounts of water, or of the food substitutes already mentioned is usually sufficient.

After the temperature returns to the normal, the diarrhea ceases, and the feces appear normal, a more rapid convalescence is secured by a change of climate. Perhaps this is partly due to the lessened risk of reinfection, but it is also partly due to the tonic influence of the change. Especially a change from sea or lakeside to mountains, or from inland towns to the sea, greatly facilitate recovery.

**Prognosis.** The usual duration of the disease is ten to fifteen days. Vigorous children in good surroundings nearly always recover promptly; weak children, those who are teething and those placed in unhygienic surroundings, give rather a gloomy prospect. Good nursing with the treatment as indicated should lead to recovery in all uncomplicated cases.

**Sequelæ.** After an attack, the lumbar spinal column is left more rigid than normal; no doubt this is partly the reason why



each attack lessens the resistance to later attacks of this as well as of other forms of enteritis.

### CHRONIC ENTERO-COLITIS OF CHILDREN

(Chronic enteritis; chronic intestinal indigestion; chronic ileo-colitis)

Chronic entero-colitis is a disease involving the lower ileum and the colon, associated with varying inflammatory derangement of the other parts of the digestive tract, and characterized by mal-nutrition, nervous instability and alternating constipation and diarrhea.

**Etiology.** It follows repeated attacks of acute enteritis, and is chiefly due to bad food, imperfect hygiene, and changeable, especially hot and humid, climates. Bony lesions of the dorso-lumbar region are important factors.

The children are always thin, pale, sallow, anemic, with dark rings around the eyes and mouth. The abdomen is large and protuberant—this is partly due to the anterior lumbar spine so often present. Flatulence is usual. The bowels are usually constipated, with pale stools, lumpy, very foul in odor. Attacks of diarrhea occur, with large, thin, gray or brown stools, frothy, foul, and frequently containing fragments of undigested food. Considerable quantities of mucus and sometimes a little blood may be passed.

The appetite is whimsical; the tongue may or may not be coated; the breath may or may not be foul.

The nervous symptoms vary from a general irritability to seizures resembling petit mal. Convulsions may be epileptoid. The child is easily fatigued, cross, irritable, and emotional to an unnatural degree. Sleep is disturbed, night terrors are frequent; grinding of the teeth during sleep is characteristic. Convulsions may occur during the diarrheal attacks.

There may be fever, 99° to 105.5° F., from toxic causes.

The lumbar spine is rigid and usually anterior; posterior lesions of the dorso-lumbar region are sometimes present. Anterior lower thoracic is often associated with the posterior lumbar condition. Lesions involving the cervical region have been reported. Coccyx lesions may also be found.

Cervical lesions are more common in children in whom the nervous symptoms are most pronounced.

**Diagnosis.** This condition may be distinguished from true epilepsy by the character of the attacks, which are rarely typically epileptical; from kidney disease, by urinalysis; from intestinal parasites by the character of the stools; and from the ordinary diseases of mal-nutrition, by the lack of skeletal changes and the history of the case. It is often associated with rickets, marasmus,

epilepsy and kidney disease, in which cases diagnosis presents difficulties.

**Treatment.** This is hygienic, dietetic and corrective. The correction of the bony lesions as found, with increased mobility of the ribs and the lumbar spine, usually gives better appetite, better sleep and better digestion. The clothing must be light and loose, and not too warm; chilling of the body must be prevented. Much open air is necessary; a change of climate is advisable if this is possible.

Daily **massage** once a day is helpful; the mother should be taught to do this. If some oily substance is provided, with instructions to "rub in" a given quantity, the massage is more comfortable and a definite end is provided. A cool bath daily, with warm baths for cleanliness and when the nervous symptoms are more pronounced is advisable. All baths should be followed by a good rub-down.

**Diet.** For young infants, good breast milk is most important. If this is impossible, artificial foods must be tried, one after another, until a suitable food is found. Starches are to be absolutely forbidden; thoroughly dextrinized foods in which practically no starch is present may sometimes be allowed.

White of egg beaten in water and strained; peptonized milk; toast water; beef juice; scraped beef or mutton, lightly broiled; buttermilk and junket may be given to suitable ages of children. The juice of fresh fruit, especially oranges, should be given one hour before the meal, once a day.

After two months of improvement, stale bread, cut thin and dried until crisp, may be given in small quantity and with no butter. Broths of mutton, beef, or chicken may replace a milk feeding occasionally. A little vegetable juice should be added.

After three or four months of improvement, green vegetables, preferably spinach, stewed celery, etc., may be added once a day.

After two or three months more of gain, thoroughly cooked rice or macaroni may be given twice weekly. With this diet, the child can get along comfortably for a year or so and no larger variety given until all symptoms have disappeared for some time.

Free water drinking is to be encouraged.

The **nursing** is a very important factor. Enemas are to be given according to the bowel conditions, varying with the needs of the patient. Too much irrigation of the colon is irritating, yet the presence of irritant feces must not be permitted. Hospital nursing gives better results than home care, unless the latter is unusually good.

**Prognosis.** Recovery is always very slow, though marked improvement usually follows the first two or three treatments and change in diet. The prognosis is better where the diet and the



hygiene have been very bad, and when pronounced bony lesions can be found, unless the child has lost too much strength before treatment is begun.

**Sequelæ.** When the patient can be kept under observation until recovery is complete no sequelæ are to be expected. When abnormal conditions of the cervical or lumbar vertebræ are allowed to remain, recurrence of the enteritis and a tendency to gastro-intestinal disease may remain throughout life. A tendency to nervous disorders probably results partly from the absorption of the poisons and partly from persistent cervical lesions.

**Prophylaxis.** Better education of mothers along hygienic lines; more frequent examination of children's physical condition; better hygiene and sanitation everywhere, must ultimately eliminate the disease.

### CÆLIAC AFFECTION

(Diarrhea alba; diarrhea chylosa)

The coeliac affection is a peculiar disease of children marked by pale, loose, offensive stools, progressive emaciation and ultimately proving fatal.

**Pathology.** Ulcers have been found in the intestine. Little is known of the intestinal state.

**Etiology.** It affects children from one to five years and is not associated with either tuberculosis or other hereditary disease. *Filaria sanguinis hominis* has been found in the feces in a few cases.

**Diagnosis.** The symptoms begin insidiously with progressive wasting and pallor, the belly becomes doughy and inelastic, there is often flatulence, fever is not often present, and the disease is lingering. The stools are pale, loose, gruel-like, bulky, not watery, frothy, and extremely offensive.

Examination of the stools, urine, and blood for evidences of filaria should be made.

**Treatment.** No cases have been reported by osteopathic physicians. Symptomatic treatment according to conditions as found is indicated. Careful study should be made in each case, and the treatment determined from the results of this study.

**Prognosis.** Fatal, usually in a few days, according to medical reports.

## CHAPTER VIII

### INTESTINAL INFLAMMATIONS OF ADULTS

#### ACUTE ENTERITIS

(Intestinal catarrh; muco-enteritis; inflammation of the bowels; duodenitis; jejunitis; ileitis; colitis; catarrhal enteritis; acute diarrhea; acute entero-colitis of adults)

This is a catarrhal inflammation involving the mucous membrane of all or any part of the intestine, characterized by diarrhea and abdominal pain, without tenesmus.

The localizing terms, duodenitis, jejunitis, and ileitis, etc., have little practical value for they are of difficult diagnosis. Duodenitis is usually associated with gastritis; when abdominal pain and tenderness on palpation, gastritis, and constipation occur, duodenitis may be suspected; when the swelling of the membrane closes the bile duct, and jaundice is present, the diagnosis of duodenitis is fairly certain. In ileitis the colon is usually affected also, and the symptoms of colitis appear. Undigested food remnants, the absence of symptoms of colitis, formed stools containing flecks of mucus, point to jejunitis. Unchanged bile, flecks of mucus often bile-stained and intermingled with the rather solid feces, point to a wide inflammation of the small intestine.

Reflex muscular contractions along the spinal column help in localizing the disease—from duodenitis with its reflexes as high as the fifth or sixth thoracic spines, to colitis, with its reflex muscular contractions involving chiefly the lumbar region, and proctitis, involving the lumbar and sacral segments, there is a fairly constant representation of the segmental innervation of the intestinal tract in the spinal musculature.

**Etiology.** The causes may be structural or environmental. The structural causes include weakened resistance, and the presence of bony lesions, especially of the dorso-lumbar spinal column. Lesions as high as the fifth thoracic vertebra affect the upper part of the tract, and lesions of the lumbar vertebræ, innominates and sacrum affect the colon and rectum. These lesions predispose to disease of the intestinal tract, and there may be further localizing factors in the character of the exciting causes. Sudden strains affecting these spinal areas may be the exciting cause of an acute enteritis which is very closely localized according to the segmental innervation of the intestinal walls.

The environmental causes include sudden changes in temperature; dietetic errors, such as improper foods, spoiled foods, very cold drinks, hasty eating, especially when tired or emotionally excited; bacterial toxins; drugs, such as mercury, arsenic, morphine in some individuals, purgatives, alcohol.

**Diagnosis.** The chief symptoms are: griping, and colicky pains, followed by diarrhea (four to twenty or more stools in twenty-four hours); borborygmi; nausea, anorexia, slight or no fever, and



weakness depending upon the diarrhea. Thirst is often severe. Oliguria depends upon the diarrhea.

The feces show undigested food; epithelial debris; mucus flecks which are bile-stained and intermingled with the fecal masses; bile pigments; triple phosphates, and various micro-organisms. When the colon is not involved, the fecal masses may be formed and solid. With the occurrence of colitis the feces are thin and very offensive, sometimes containing blood and large masses of mucus, approaching the dysenteric character.

Reflex muscular contractions are constant; the spinal and abdominal muscles affected give information as to the locality of the greatest irritation.

There is some tympanites, not often pronounced. The tongue is furred and dry. Splenic enlargement may be found, which subsides with recovery. When there is marked prostration, headache, high temperature, pain in the joints, a specific infection should be suspected.

Sometimes what seems to be a simple acute enteritis leads rapidly to symptoms of overwhelming toxemia, collapse and death. This is due either to malignant disease, before unsuspected; perforation; complications, such as cardiac disease, arterio-sclerosis, nephritis, or diabetes; or to the presence of specific micro-organisms.

**Treatment.** Rest in bed is absolutely necessary. Spinal relaxation of the contracted muscles, correction of the lesions present in the individual case, and regulation of the circulation is indicated. The diarrhea usually stops spontaneously when the irritant has been expelled. But if it continues after a reasonable time has elapsed warm enemas should be given to wash away the remnants of irritating materials. Deep steady pressure at the second lumbar vertebra may check the peristalsis and give rest.

Hot fomentations to the abdomen are useful. Very careful work over the abdomen may be beneficial. The diet must be absolutely restricted to hot water or thin malted milk until the symptoms show decided improvement.

In sigmoiditis and proctitis the tenesmus and colicky pains can usually be controlled by relaxing, inhibiting and stretching the sacral and lumbar spinal tissues.

**Prognosis.** The outlook is usually good. The duration is from three to ten days, according to the severity of the case. The disease may pass into the chronic form if the etiological factors are not removed.

**Prophylaxis.** Public hygiene requires the utmost carefulness in regard to the cleanliness of the water and milk supply. Individual prophylaxis consists in carefulness of the diet in the summer and autumn, that the food is unspoiled in any manner, that dairy products are clean and sweet, and that fruit is ripe and not decayed.

Maintenance of correct spinal relations is important in prophylaxis.

### CROUPOUS ENTERITIS

(Membranous enteritis)

Croupous enteritis is an inflammation of the intestinal membrane, characterized by tenderness, paroxysmal pains, moderate fever, and the discharge of membranous shreds or casts in the stools.

**Etiology.** The condition may be terminal, in the final stages of chronic constitutional diseases, or it may occur secondarily, in the acute infectious diseases. Certain poisons, as mercury, lead and arsenic; or the mechanical irritation of impacted feces, gall-stones, or intestinal "sand" may cause the condition.

**Diagnosis.** The condition may not be recognized ante mortem, or it may present fairly typical symptoms. Paroxysms are usually preceded by various neurotic symptoms. There are feverishness, soreness, tenderness, and distention of the abdomen, spasmodic colicky pains around the umbilicus; these symptoms continue for a day or two and are then followed by diarrhea, pain, tenesmus, with the appearance of mucus, shreds of membrane, or cylindrical casts of the bowel, and sometimes blood.

**Treatment.** Palliative treatment includes that indicated in acute catarrhal enteritis, until the underlying causes can be found, and, if possible, removed. The diet must be urgently restricted; the liquids taken should be diminished until the symptoms disappear. The condition is always serious, and the patient must receive careful nursing.

**Prognosis.** In the acute infections, not otherwise serious, recovery is to be expected. In cases with history of long constitutional disease, the prognosis is very grave; not rarely croupous enteritis initiates the terminal stages of such diseases.

### ULCERATIVE ENTERITIS

The intestine is subject to many forms of ulceration, the following of which may be mentioned: enteric and dysenteric forms, duodenal ulcer, catarrhal and follicular ulcers. These have already been described under their respective heads. Specific ulcers may occur in syphilis and in tuberculosis.

Syphilitic ulcers occur most frequently in the rectum and mostly in women. They are due to the growth of gummata in the submucosa and the gradual onset of a hard fibrous stricture, easily distinguished from cancer.

Tuberculosis affects principally the ileum, cecum, and colon. The ulcers are irregular, their long diameter in the circumference of the bowel, their edges infiltrated and undermined, involving the submucosa and the muscular coats. They may perforate the bowel. Cicatrization may cause stricture.



**Symptoms.** The main symptoms are periodic pain, alternating constipation and diarrhea, and slowly advancing stricture. An elongated, hard, and tender tumor-like mass may be found in the right iliac fossa. It is localized and removable by operation.

**Treatment.** The systemic treatment is most important.

**PHLEGMONOUS ENTERITIS.** (Abscess of the bowels.) This is due to pyogenic infection of the intestinal membrane after it has been injured by strangulated hernia, total obstruction of any kind, interference with the circulation, or by trauma. It is rarely found below the duodenum. Diagnosis is difficult; often impossible ante mortem.

When the diagnosis can be made, the early evacuation of the pus is important. Deep, steady pressure over the spinal areas of reflex muscular contraction, application of heat or cold to the abdomen may relieve the pain. Sometimes the pus evacuates into the intestine, and recovery occurs spontaneously. There is great danger of rupture into the peritoneum, when death is usually inevitable.

## CHOLERA MORBUS

(Cholera nostras; sporadic cholera; English cholera)

Cholera morbus is an acute inflammation of the mucosa of the stomach and intestines, of sudden onset, and marked by violent abdominal pain, incessant vomiting and purging, cold surfaces, rapid, feeble pulse, and spasmodic contractions of the abdominal and leg muscles with prostration.

**Etiology.** It is more common in children, but is not rare in adults. The exciting cause is probably microbic. The specific organism has not been isolated. The predisposing causes are unripe and decomposing fruit and vegetables, and hot weather with high humidity and sudden changes.

**Diagnosis.** There is sudden onset with vomiting and purging, very severe and paroxysmal pain in the upper abdomen, the surface is cold and covered with a clammy sweat, severe muscular cramps, and pulse small and feeble. There is intense thirst. Collapse may occur. The vomitus at first consists of the stomach contents, then bile, and later, water and greenish-colored fluid bitter to the taste. The stools are frequent and often continuous and resemble the Asiatic cholera "rice-water stools" in character.

**Treatment.** If the violent vomiting and purging have not already cleared out the offending material, the stomach should be washed and enemas given.

Deep, steady pressure applied from the ninth to twelfth thoracic vertebræ helps quiet the sensory nerves from this area. Often pressure over the solar plexus through the abdominal wall will produce the same result. If there is any sign of collapse, apply heat to the abdomen after giving the above treatment.

Correction of any bony or muscular lesions found protects the patient against further attacks.

If the cramps are in the legs, deep, steady pressure over the sacrum will usually relieve them. Carefully elevate the viscera. No food should be given until the acute symptoms have disappeared. After the pain has subsided, especially if the blood pressure is low, corrective treatment given briskly permits the most speedy return to normal tonicity of the affected viscera. Increased mobility of the lower thoracic spinal region, and raising of the lower ribs is usually indicated.

**Prognosis.** Recovery is usual although death may occur within two days of onset. The mild cases recover spontaneously in a few days. The severer cases persist for a week or more and under medical treatment are followed by a tedious convalescence. With osteopathic treatment the course of the disease is usually shortened, convalescence is less tedious, recovery is complete, and the frequent sequelæ due to the use of severe drugs, as well as to the disease itself, are not encountered.

### ACUTE COLITIS

(Acute dysentery; ulcerative colitis; bloody flux)

This is an acute inflammation of the mucous membranes of the large intestine caused by irritating foods, bad hygiene, impure water, and the cachectic state, and characterized by fever, tormina, tenesmus, and frequent mucous and bloody stools.

**Diagnosis.** The disease begins gradually with diarrhea, anorexia, nausea, and very slight fever. These symptoms may continue for three or four days when there is pain on pressure along the course of the transverse and descending colon, colicky pains about the umbilicus, burning pain in the rectum with tenesmus especially when the bowels move and for a short time afterward.

The stools vary from five to twenty in twenty-four hours. For the first day or two the stools contain more or less fecal matter, soon changing to a grayish, tough, transparent mucus containing more or less blood and pus. During the tormina, pain and vomiting may occur. The urine is scanty and high-colored.

**Treatment.** As considerable muscular contraction is found in the lower dorsal and lumbar even to the coccygeal regions, the relaxation of these areas is indicated with the correction of any deviations found. Interosseous rotations are commonly found between the second and the fourth lumbar, which, if adjusted, will usually give quick relief. Careful, deep treatment of the abdomen is sometimes effective. As soon as possible the irritating material should be removed from the bowel, by enemas and by careful, gentle raising of the colon. Food should be withheld until convalescence begins when the most easily digested with the least residue



can be given. If the patient becomes much weakened, malted milk, broths or albumen water may be given.

**Prognosis.** Recovery is to be expected in about a week, in patients not already weakened by other causes. Convalescence may be tedious and wasting rather marked. Aged patients, and those weakened from any cause, may die in the second or third week, or may linger for a longer time, with either recovery or death. Perforation and hemorrhage rarely occur. Recurrences are to be expected, if dietetic errors are permitted.

### APPENDICITIS

(Perityphlitic abscess; suppurative appendicitis; typhlitis; skolikoiditis; scolecitis; pericecal abscess; iliac abscess; paratyphlitis)

The symptoms of typhlitis are identical with those of appendicitis, hence the term is here included, although this inflammation may occur as a separate disease.

Appendicitis is inflammation of the vermiform appendix of the cecum; characterized by pain in the right iliac fossa, tenderness at McBurney's point, rigidity of the right rectus muscle, and general symptoms of nausea, vomiting, constipation, and fever.

**Etiology.** Appendicitis is due to infection by the bacillus coli, pyogenic cocci, or bacillus proteus upon an abraded surface caused by some irritant from the food, or fecal concretions, or due to perverted blood and nerve supply resulting from subluxated lower ribs or the vertebræ from the tenth thoracic to the third lumbar. A number of cases will respond immediately when the lumbar lesions are adjusted. Muscular overstrain; indiscretions in diet and habits; age, from fifteen to thirty, are predisposing factors.

Although the possibility of infection of the appendix from the ovary might be expected to increase the relative number of cases of appendicitis occurring in women, and although women's dress is such as might be expected to favor diseases of the appendix, as of other abdominal viscera, yet about three times as many appendix cases occur in men as in women. This is probably due to the better circulation of the blood and the better lymph drainage in women, by way of the ovarian relations. This consideration shows the tremendous importance of proper circulation and drainage in the prevention and cure of diseases of the appendix, and leads to a better understanding of the importance of correct osteopathic treatment in this disease.

The pathologic anatomy is described when the kinds of inflammation are mentioned: catarrhal, which may become chronic or produce a fibrous appendix; phlegmonous; ulcerative; or gangrenous.

**Diagnosis.** The attack may be ushered in with several days of digestive disturbance and colicky pains or may appear suddenly, particularly after a full meal. The most characteristic symptoms are as follows: Pain is at first over the whole abdomen but is soon localized in the right iliac fossa. Tenderness is soon present, usually greatest at McBurney's point. Rigidity of the right rectus muscle is often replaced in two to three days by an oval tumor about the size of a hen's egg. The patient assumes a characteristic posture, lying on his back with the right leg drawn up. Elevation of temperature is typical,  $102^{\circ}$  to  $104^{\circ}$  F.; a fulminating type may succumb before much fever appears. The gangrenous type usually has a normal or subnormal temperature. General symptoms of furred tongue, constipation, vomiting which varies and is not excessive and not fecal, and a full and strong pulse are present in typical cases.

If the attack is light, the pain, tenderness, and fever lessen about the third day and the illness is over in about a week, followed by complete recovery. Recurrent attacks vary from rare ones to those rapidly repeated. Chronic appendicitis may follow acute attacks.

If recovery does not begin before the sixth day, a local abscess is probably forming. The fever continues or increases, becoming of a septic type; the swelling is larger, harder and more tender; but fluctuation is rarely obtainable. The general symptoms become more severe. The abscess may rupture and produce a diffuse peritonitis; or may be walled off and rupture into the intestine, vagina, the lumbar region, liver, or around the kidney, or they may become very well walled off by adhesions and set up only a localized peritonitis. Perforation into the peritoneum from either ulceration or gangrene is indicated by a sudden fall in temperature, the other symptoms remaining grave, followed by collapse, or signs of general peritonitis.

The lower ribs are nearly always found depressed, in some cases so much so that the floating ribs seem to ride the ilium. The tenth thoracic to third lumbar vertebral lesions are constant. The tenth and eleventh ribs on the right side are especially to be examined. There may be some interference with the vagi. The cervical muscles are often contracted. The clavicles and first ribs may be subluxated.

The percussion note is changed in comparison with the opposite side and changes during the course of the disease, being of a dull tympanitic tone or a distinct area of dullness.

The **urine** is febrile in character with large quantities of indican. The **blood** shows leucocytosis. A leucocyte count of 20,000 is high and indicates an acute appendicitis, with pus, gangrene, or peritonitis. In old cases there is moderate leucocytosis although a normal count may be present in a walled-off abscess. The



erythrocytes are not changed except in cases of long standing abscess when there is anemia.

Care must be taken to differentiate acute enteritis, mucous colitis, intestinal obstruction, cholecystitis, renal colic, salpingitis, typhoid fever, malaria, ectopic gestation, and lead poisoning.

**PSEUDO-APPENDICITIS.** This term is applied by J. F. McNary to a condition found simulating appendicitis. The twelfth dorsal, the twelfth rib, and muscles attached to it, and the sub-costal nerve are the seat of irritation; the rectus muscle is relaxed; by grasping the abdominal wall over the cecum with pressure, pain is produced; but, bearing down upon the cecum, pain is not produced; the appendix is not diseased, though the cecum may be impacted, and elevated temperature, accelerated pulse, nausea, and constipation may be present.

**Treatment.** Absolute rest in bed, when symptoms resembling those of appendicitis occur, is the only safe procedure. If further examination gives another diagnosis, no harm is done by the rest, in any case.

As soon as is possible, a blood examination should be made; this is for the sake of securing correct data for later study, as well as for the useful information thus secured at the time.

It is generally recognized that surgery is contra-indicated during the time of beginning abscess. (The "early operation" is performed before abscess formation occurs—first to third day, for example.) After pus begins to be formed, no surgery should be attempted until the abscess becomes circumscribed; many surgeons prefer then to await recovery from the acute attack. Before the third day, the propriety of surgery is doubtful, since the diagnosis is usually doubtful. From the first to the third day, if surgery is not performed, and from the third day until recovery or the appearance of more serious symptoms, gives the time for the use of nonsurgical measures.

Any case of appendicitis is potentially surgical. It should be a routine procedure to have everything in readiness for surgery at a moment's notice. If a conservative surgeon can be seen in consultation this is the best possible thing; the opinion of the surgeon who has his knife always ready is of no value. Surgery should not be employed when the case is complicated with certain constitutional diseases, diabetes, nephritis or cardiac disease, nor during the early stages of pus formation.

Rapid leucocytosis indicates pus formation, and should lead to great care; surgery may be suddenly necessary.

Sudden rise of temperature indicates increasing inflammatory process; sudden drop in temperature may indicate gangrene or rupture of an abscess. Rigor and chilling, profuse sweating, diarrhea, vomiting, collapse, may be associated with rupture of the pus into the abdomen or elsewhere. Relief of the pain may indicate gangrene, especially when the constitutional symptoms remain serious.

"Colitis follows appendectomy more frequently than other abdominal operation. The explanation is that the appendicitis is seldom localized in the appendix but is complicated by colitis, or rather, the colitis is complicated by the appendicitis. In such case, removal of the appendix aggravates rather than alleviates. A conclusion to be drawn is, to carefully palpate the colon in appendicitis cases and reserve diagnosis, prognosis and the advising of an operation until it can be definitely determined as to the location, extent and degree of the disease. The formation of pus is an indication requiring immediate evacuation.

"If good surgical advantages are available and the case begins with considerable virulence and a surgeon can be had within the first twenty-four hours, it is in all probability best to operate; but if the case begins slowly or no good hospital advantages are available, or if the case is not seen until some forty-eight hours have elapsed after the onset, in all probability it is strictly an osteopathic case and should not be touched by surgery. Some advocate waiting in all instances until pus is formed before operative procedure is resorted to. This is rather a dangerous attitude to take, for I have seen hundreds of cases operated and have operated upon a great many myself and I have never seen a case die except it was a pus case. Every clean case recovered from the operation."—S. L. Taylor.

Without disturbing the patient more than very slightly, it is possible to secure thorough relaxation of the tissues found contracted along the spinal column and through the cervical region. If the clavicles and upper ribs are subluxated, these may be corrected. The vertebræ should be examined, and the possibility of intervertebral movement secured throughout. Deep, steady pressure may relieve the pain of the corrective treatment. All manipulations should be very gently given, in order to prevent sending irritating sensory impulses into the spinal or bulbar nerve centers.

Having eliminated the presence of pus, by physical examination, symptoms, and the lack of leucocytosis, local manipulation can be given. The patient is turned upon the right side, or in the right lateral position, or semiprone, and the tissues around the cecal region lifted and gently drawn upward. The tissues may also be grasped very gently, and pushed toward the painful area. The patient may lie in this position for a time, if comfortable; changing position gives better circulation and drainage, generally. But this performance is absolutely contraindicated if there is the least possibility of pus formation. Such treatment, given during an early stage of pus formation, might lead to serious, even fatal, results.

Treatments should be given from once to three times each day, during the first week; from three times to once a week during improvement and convalescence. Too speedy cessation of treatment may permit recurrence or a chronic condition; also the persistence of bony lesions which may lead to other gastro-intestinal disorders, later.

In the beginning, the colon should be cleansed thoroughly. This is to be done by enemas of water, salt solution, warm olive or other oil. It is necessary simply to wash the colon. Absolutely



nothing irritating should be used for this purpose, either as enema or as purgative medicines. The use of purgative medicines is doubtless responsible for many fatalities, and increases the necessity for surgery. Members of the family must be obedient in this respect—too often purgative medicines are given disobediently.

Do not permit opiates to be given.

No food is to be given. Water is supplied through the enemas; this is absorbed from the mucous membrane. The mouth may be often washed with cool water; a very little lemon juice or pineapple juice may be comfortable, but cool water is usually most grateful. After the danger of pus formation has passed, small amounts of liquids may be permitted, and the return to normal foods made very slowly. A week or more of fasting, followed by a week or two of liquid diet (milk, fruit and vegetable juices, albumen water and broths) leaves the patient with greater strength and opportunity for more rapid recovery than the dangerous use of greater range of diet. When the lack of food seems to cause much feeling of weakness, rectal feeding may be resorted to; rubbing the limbs with oils gives a pleasant sense of increased strength, and while it is not probable that any absorption occurs, yet patients feel better for this massage. Any nurse can do this work over the limbs several times a day, if necessary.

Heat and cold relieve the pain considerably. Hot water bottles should be partly filled and the air forced out, in order to make them light in weight and not noisy. An electric pad is very convenient, but must usually be watched to prevent burning; these are sometimes supplied with a safety device which makes them self-regulating, but even then they should be watched. Hot compresses may relieve when dry heat is useless. Mustard plasters may relieve the pain, but they must not be allowed to injure the skin. Blisters are probably best omitted.

For cold, ice bags, made light in weight, are probably best. A water bag containing a small amount of cold water, often replaced, may be most comfortable. Cloths wet in icy water may be used, but this is difficult to manage at home. A large ice bag, suspended so that it barely touches the skin but exerts no weight, is perhaps the most pleasant way of applying cold.

A small sand-bag, either hot or cold, placed under the dorso-lumbar spinal column, gives relief in some cases. Either heat or cold, applied to the spinal region of most marked muscular tension or of greatest sensitiveness, exerts a reflex effect upon the pain in the abdomen.

Sometimes the skin over the appendix has been blistered, or burned by "home remedies"; in such cases heat or cold may be applied over the spinal areas, or over the lower ribs, or around the groin with great relief.

"Spinal treatment depends upon location of reflex muscular contractions and painful areas; should be given once to three times each day at first, until pain diminishes, which should be in one to three days."—R. D. Emery.

"In all cases of appendicitis, there is much contraction in the right side, in the muscles of the lumbar region, and in the muscles of the abdomen, which will draw the right iliac, and the right innominate, so that there will appear to be an innominate lesion, and when the irritation is relieved, the innominate lesion will disappear."—T. L. Ray.

**Prognosis.** In non-suppurative cases, either with or without surgery, recovery is the rule. In suppurative cases, with surgery, the mortality varies.

There is great liability to recurrences. To prevent such, the most careful attention must be given to the diet, to exercises to prevent constipation, to all means of promoting good circulation and drainage of the entire abdomen by having thorough treatment to keep the blood and nerve supply in the best possible condition.

**Sequelæ.** Repeated attacks result in increased adhesions, obliteration of the appendix and ultimate recovery; but in any one attack, abscess or peritonitis may occur; or the mass of adhesions cause poor circulation and impaired function of the bowels; or a train of ill-health with ill-defined digestive disorders.

The removal of the appendix in such cases is a matter requiring consideration, since it is difficult, even with the fluoroscope, to know the extent and nature of the old adhesions, or whether the new adhesions, resulting from the removal of the appendix, will be greater or less than those already present.

## CHRONIC ENTERO-COLITIS OF ADULTS

(Chronic diarrhea; mucous colitis; chronic colitis)

This is not a very common disease, in its noninfectious form. It is usually the sequence of repeated attacks of acute enterocolitis or of the constant effects of bony lesions or irritants.

The **symptoms** are those of intermittent or remittent diarrhea, with stools covered with mucus, or followed by strings or masses of mucus, both during the diarrheal attacks and in the intervals. This passing of mucous stools in the intervals of the attacks is the most trustworthy diagnostic symptom. Sometimes in the exacerbations rather large amounts of blood may be passed, more rarely shreds of membrane. Gripping and colicky pains may be associated with the diarrheal passages.

Chronic colitis of a rather persistent type has been found due to the constant use of irritating enemas. For example, the use of strong salt solution, water with large amounts of impure or alkali-bearing soaps, very hot or very cold water, and solutions of Epsom and other purgative salts, are often used. It is a not



unusual practice for patients to work for the elimination of the mucus, under the idea that relief is thus obtained.

The treatment and prognosis depend upon the causes of the irritation. When these factors can be eliminated, recovery is usually speedy.

Strong corrective treatment, given through the lower thoracic and upper lumbar region, securing increased mobility of each articulation of vertebra and ribs, raising the ribs thoroughly, and such other corrections as may be indicated in each case, usually relieves the attacks. With continued treatment, recovery is often complete.

Dietetic error should be corrected; no food should be given during an acute attack.

**Chronic Dysentery**, see Acute Infectious Diseases.

## PROCTITIS

(Catarrh of the rectum; dysentery; rectitis)

Proctitis is an inflammation, usually catarrhal, of the mucous membrane of the rectum and anus, characterized by pain, tenesmus, and frequent stools of hardened feces or of mucus, pus and blood.

The causes are constipation, improper use of enemas and habitual use of purgatives, diseases of the liver, hemorrhoids, sitting upon the damp ground or cold places, and lesions in the lumbosacral, sacral or coccygeal regions of the spine.

**Diagnosis.** There is a sudden onset with chill, general malaise, slight fever, pain and discomfort, increasing to a burning pain in the rectum which radiates to the adjacent parts, a sense of fullness and weight in the rectum, the passage of hardened feces, later mucus, muco-pus, or blood; tenesmus; the bladder may be irritable; the mucous membrane may prolapse, and general symptoms of headache, and nausea appear. The patient usually prefers the recumbent position. In severe cases, strangury and vesical tenesmus may complicate the case. Peritonitis and hepatic abscess may occur.

If the case is protracted, periproctitis and fistulas may develop. If periproctitis supervenes, it is indicated by a thin fecal discharge at first, then followed by mucus tinged with blood. Ulceration soon follows. The parts are hot, dry, swollen, and digital examination is very painful. Later, the parts are slimy and the mucous membrane is covered with tenacious mucus and pus. If abscess is present, there will be a fluctuating mass which may show externally or may be felt by rectal touch. The use of the rectal speculum is contra-indicated in acute, nonsurgical cases.

The spinal examination shows contractions of the muscles of the back from the lower lumbar to the tip of the coccyx. Bony

lesions are detected with difficulty on account of these intense muscular contractions.

**Treatment.** The first indication is to remove the irritating intestinal contents by enema of cool water, if the case is seen early; if later, warm water is more comfortable. Warm oil may be soothing. The patient must not be permitted to lie upon his back.

Attention should be given to the sigmoid area to see that it is thoroughly elevated. As soon as lesions can be recognized and corrected, this should be done. Correction of lumbar and innominate lesions, after recovery from the acute attack, may prevent recurrence.

Patients must be guarded against sitting in cold places, straining at stool, or standing for too long periods for some months after an acute attack. Injurious habits must be corrected; these include the habitual use of dilators, irritant enemas, suppositories and other improper methods for the relief of constipation.

The pain is lessened by thorough relaxation throughout the lower part of the back and buttocks. This also favors a better circulation through the parts. Careful attention must also be given to the liver.

The diet must be restricted. If periproctitis and suppuration supervene, or are present when the case is first seen, early incision is indicated with subsequent drainage.

**Prognosis.** Usually good with proper treatment. Chronic proctitis, abscesses or fistulæ may result from neglect.



## CHAPTER IX

### DISEASES OF THE LIVER

#### ANOMALIES OF THE LIVER

The anomalies in the shape and position of the liver must not be forgotten; in making a diagnosis of disease of this organ one is sometimes confused by the presence of these anomalies. Malformations may be either congenital or acquired. Those very rare cases in which the liver is found upon the left side of the body, while the stomach and spleen are upon the right side, usually have only to be examined to become definitely diagnosed. Congenital absence of one or more of the lobes, or, rather more commonly, an increased number of lobes of the liver, may cloud a diagnosis under certain circumstances.

Tight lacing may cause an almost complete separation of part of the right lobe from the rest of the liver. This condition is becoming less rare on account of present saner fashions in corsets.

As the result of the abnormal lengthening of the suspensory ligament of the liver, or as the result of bands from adhesions and old inflammatory processes, the liver may be lower than normal. Occasionally the liver seems to be in an anomalous position on account of spinal curvature, especially when in marked kyphosis. The liver may be displaced upward by the pregnant uterus, abdominal tumors or cysts, or by considerable quantity of gas in the intestines or in the peritoneal cavity. Ascites or fat may push the liver upward or somewhat forward toward the right side.

The liver may be pressed downward by emphysema, pleurisy with effusion, mediastinal tumors or hypertrophied heart.

#### JAUNDICE

(Icterus)

This is a name applied to a group of symptoms arising from the presence of bile in the circulating blood, and is clinically manifested by a yellow or greenish-yellow tint of the skin and mucous membranes and by pruritus.

There are two classes of symptoms:

Absence of bile from the intestines interferes with perfect assimilation of fat, delays absorption, and slows peristalsis, thus permitting putrefactive changes in the intestinal contents and the production of toxemic symptoms. The feces are pale.

Circulation of bile within the blood produces toxic effects, both upon the nerve cells and upon muscular fibres, with consequently impaired heart action, slowness of the pulse, depression of spirits and mental torpidity; various tissues and secretions become bile-stained.

**Etiology.** Obstructive jaundice is caused by foreign bodies within the duct, such as gall-stones, hydatids, or distomata; or by foreign bodies from the intestine, inflammation of the duodenum

or mucosa of the duct or by stricture or obliteration of the duct, or by tumors, fecal accumulations, or pregnancy.

Non-obstructive jaundice may be caused by poisons in the blood interfering with the normal metamorphosis of bile (toxic jaundice), as in various fevers; animal poisons as snake venom; chemical poisons as phosphorus, mercury, arsenic, or toluylenediamin; chloroform or ether; or by poisons of obscure infective origins, acute yellow atrophy of the liver and Weil's disease (epidemic jaundice).

**Diagnosis.** The most conspicuous symptom is icterus or tinting of the skin, conjunctivæ, mucous membranes, and secretions; the color varying from a lemon-yellow to a deep greenish-black (black jaundice); the urine and sweat are tinted while the saliva, milk, and sputum usually escape. Xanthopsia (yellow vision) is sometimes present. Gastric disturbances may precede the jaundice. Flatulence, nausea, and often complete anorexia are common. Constipation often alternates with diarrhea; the feces are pale, intensely fetid and pasty. The pulse is slower than normal, occasionally twenty per minute. Respirations may fall to ten per minute. Extravasations of blood and hemorrhages may occur from the mucous surfaces or into the skin. The coagulability of the blood is diminished.

Among the cerebral symptoms may be noted marked depression of spirits, melancholia and, in the grave cases, coma which may end in death. Itching of the skin may be most distressing. The urine contains bile pigments and bile acids. The blood may show slight or marked changes. Fragmentation of all cells is common. In catarrhal jaundice, there may be slight leucocytosis at the onset. The plasma of the blood is bile stained. The coagulation time is slow. In toxic jaundice, the red cells are sometimes increased; the hemoglobin is somewhat reduced; and the leucocytes are normal or increased. In severe cases, there is hemoglobinemia and many "blood shadows" are to be found. Leucocytes show the effects of the toxin.

**Hereditary Icterus.** The jaundice is slight, the stools are not clay-colored; splenic enlargement is marked; the general health is not much impaired. In another group of cases, there is enlargement of the liver and spleen and marked constitutional disturbance, with only slight jaundice.

**Icterus Neonatorum.** This form of jaundice occurs among the new-born and may be mild or severe in type.

The mild type appears on the second or third day and lasts from seven to fourteen days, presenting few symptoms beside the jaundice and the pale stools. Nothing more than the ordinary hygienic care of the infant is needed. It is possibly due to the large



destruction of red corpuscles which takes place in the first few days after birth, or to the patency of the ductus venosus, allowing the portal blood to mix with the systemic blood.

The severe form is due to congenital absence of the hepatic duct, congenital syphilitic hepatitis, or phlebitis of the umbilical vein. It is invariably fatal.

**Treatment of Jaundice.** Find the cause and remove it if possible. (See Gall-stones.) Correct subluxations of the vertebræ and ribs from the fifth dorsal to the first lumbar. The bowels must be kept active by treatment and exercise. The diet should be light, and easily digested, consisting of fruit, vegetables and milk.

The itching, if not relieved by the treatment, may be alleviated by warm baths. Carbolic lotion (1:40) may be used in severe cases.

**Prognosis.** The outlook depends upon the cause of the jaundice. In acute yellow atrophy (q. v.) a fatal termination is to be expected; this is also the case in the jaundice due to malignant neoplasms. Nearly all living cells are injured by bile; they recover their normal function, if at all, only after the removal of the bile from their vicinity. Nervous symptoms often persist for some weeks after the skin becomes clear, and these are apt to recur on fatigue or indigestion for several months after other symptoms of jaundice have disappeared.

## HYPEREMIA OF THE LIVER

(Congestion of the liver; torpid liver; biliousness)

This is characterized by an abnormal fullness of the vessels of the liver with consequent enlargement, slowness of the digestive and mental functions, and slight jaundice.

**Etiology.** Active hyperemia is caused by too great heat; habitual constipation; excesses in eating and drinking; use of alcoholic and malt liquors; and in females, by arrested menstrual period. It is sometimes a complication of the acute infections. Bony lesions of the sixth to the eleventh thoracic vertebræ and the sixth to the twelfth ribs are important in etiology. Passive hyperemia is due to cardiac and pulmonary disease.

**Pathology.** The liver is enlarged in all directions and is abnormally full of blood. In cases due to obstructive diseases of the heart and lungs, it presents the "nutmeg liver" appearance. The dilated radicles of the hepatic veins with pallor of the neighboring parts of the lobule are noted. Long-continued congestion leads to atrophic degeneration or to cyanotic induration.

**Diagnosis.** The symptoms of active hyperemia include malaise, aching of the limbs, very slight fever, headache, mental depression, coated tongue, anorexia, nausea and sometimes vomiting, constipation and flatulence, a feeling of weight and soreness in the liver

area with a dull pain extending to the right shoulder. The liver is uniformly enlarged and tender, the complexion is muddy and there may be slight jaundice.

In passive hyperemia the symptoms are much like the above but less severe. The onset is gradual and gastrointestinal catarrh is common. In addition, there are the symptoms of the causal disease. If the hyperemia is due to incompetency of the tricuspid valve, the whole organ may pulsate.

**Treatment.** Thorough direct manipulation to the liver by raising and spreading the ribs facilitates drainage. All subluxations which might bear a causal relation to disturbances of the hepatic circulation must be corrected. A scanty diet of easily digested foods with an absence of sugars and fats, as far as possible, is usually best. If the pain is severe, hot applications may be used over the liver region, or a heating compress may be applied. The bowel action must not be permitted to become sluggish.

The passive form requires, in addition, the treatment of the primary disease.

**Prognosis.** An attack of active hyperemia usually lasts about a week, ending in recovery. If a constant repetition of attacks occurs, atrophic degeneration is usual. The prognosis in passive hyperemia depends entirely upon the nature and curability of the primary disease.

### ACUTE YELLOW ATROPHY

(Icterus gravis; acute or general parenchymatous hepatitis; hemorrhagic icterus; malignant or infectious jaundice)

An acute, general inflammation of the hepatic cells resulting in their rapid disintegration and characterized by decreased size of the liver, deep jaundice, hemorrhages and profound cerebral symptoms.

**Etiology.** The disease is apparently due to some toxic agent circulating in the blood. It occurs most frequently in young pregnant women from the third to the sixth month of gestation. Among the other causes are: Infectious diseases, preëxisting disease of the liver, alcoholic and venereal excesses, syphilis, poisoning by phosphorus, arsenic, or antimony, and sometimes fright or profound mental emotion. Chloroform anesthesia is usually considered doubtful. In one P. C. O. clinic patient this seemed to be the only cause.

**Pathology.** The early hyperemia of the hepatic cells with a grayish exudation between the lobules soon produces a soft, friable organ of a dull yellow color; the cells rapidly disappear and are replaced by fat globules; yellow and red atrophic patches are found, while granules of pigment and crystals of leucin and tyrosin are seen microscopically; the whole organ is reduced in size and weight, the peritoneal covering being loose and wrinkled. The spleen,



kidneys, heart, and muscles undergo parenchymatous degeneration and show bile-staining.

**Diagnosis.** The prodromal symptoms are mental and bodily depression, constipation, gastrointestinal catarrh, tenderness of the liver region, quickened pulse, headache, and slight jaundice with moderate itching. These may continue from one to three weeks.

The confirmed stage is indicated by deepened jaundice, usually rapid pulse, persistent headache, and insomnia, persistent vomiting, cerebral symptoms, and trembling of the muscles. As a rule, there is no fever, though it may be severe, perhaps to 106° F. The tongue is dry and coated. Delirium and convulsions, abdominal pain, hemorrhages from mucous surfaces and into the skin, "coffee-ground" vomit, tarry or pale stools, all follow rapidly. Pregnant women abort, often with severe hemorrhage; this does not interfere with the course of the disease to its fatal termination. The typhoid state ushers in the end which may come within a week or may be prolonged for two or three weeks.

The area of liver dullness diminishes rapidly and may ultimately disappear. There is pitting in the epigastrium; the spleen is enlarged. The spinal tissues are extremely hypersensitive; the usual palliative manipulations were absolutely inefficient in one P. C. O. clinic case.

**Urine** shows diminished quantity; strongly acid reaction; normal solids diminished; leucin, tyrosin and other abnormal nitrogenous compounds are usually present. The albuminuria, casts and renal epithelium are due to the associated nephritis.

Moderate leucocytosis with **blood** otherwise normal is recorded. Usually all blood cells show the effects of the poison; erythrocytes are vacuolated and often fragmented; lymphocytes contain granules, have aberrant nuclear forms, and irregular protoplasmic outlines; the neutrophils are most profoundly modified, having eccentric or extruded nuclei, vacuolated protoplasm and nuclei, ragged outlines, and other signs of the effects of some intense poison.

**Treatment.** Palliative measures are indicated. The ice cap may relieve the convulsions or delirium. Subcutaneous injections of normal salt or the use of the Murphy drop method may relieve the toxemia. Correction of the lesions as found, raising of the lower ribs should be a part of the treatment. Careful study of every patient should be made, in the hope of securing knowledge that leads to better prophylactic and therapeutic methods than we now possess. Pregnant women with history of individual or family tendency to hepatic disturbances should be very closely watched.

**Prognosis.** Typical cases always terminate fatally; atypical cases, in whom the tissue destruction is absent or slight, may recover, after long and tedious illness. Pregnant women abort, which does not affect the prognosis.

### INTERSTITIAL HEPATITIS

(Cirrhosis of the liver; sclerosis of the liver)

Interstitial hepatitis is a chronic inflammatory disease of the liver characterized by overgrowth of its connective tissues, and symptoms referable to the effects produced upon the liver cells and the bile capillaries by this pressure. Three classes are recognized which vary slightly in pathology and in symptoms but whose treatment and prognosis are very much alike.

When the portal circulation becomes obstructed, a collateral circulation is established by way of anastomosis between the branches of the portal vein and the systemic veins. The anastomoses which are most frequently efficient are those between the gastric and the esophageal veins; the veins of the intestines and the retro-peritoneal veins; the portal vein with the epigastric (hence the *caput medusæ*), and the superior hemorrhoidal of the inferior mesenteric vein with the inferior and middle hemorrhoids of the internal iliac vein. These anastomotic veins become greatly dilated in the presence of hepatic cirrhosis and the circulation thus established may be so efficient in some cases that practically no symptoms are produced. The *caput medusæ*, the dilated superficial abdominal veins and the hemorrhoids usually lead to a suspicion of the hepatic obstruction. Several types of interstitial hepatitis are recognized.

### ALCOHOLIC CIRRHOSIS

(Laennec's cirrhosis; drunkard's liver; gin drinker's liver; hobnailed liver; nutmeg liver; portal-cirrhosis; atrophic cirrhosis; multilocular cirrhosis)

In this form of cirrhosis the multiplication of the connective tissue originates around the branches of the portal vein. The capsule of the liver is much thickened, the surface is rough and presents the "hobnailed" appearance. As the names indicate, the condition is chiefly due to prolonged alcoholism, though heredity and syphilis are certainly important etiological factors; the overuse of highly seasoned foods is also considered causative in rare instances.

**Diagnosis.** The onset is usually gradual. Catarrhal disturbances of the stomach and the intestines with morning vomiting, nausea, anorexia and acid eructations usually lead to a diagnosis of chronic gastritis in the early stages. Epistaxis may be a rather early symptom; hemorrhoids, a sense of weight or aching in the liver region or under the right shoulder occur when the portal circulation becomes too greatly impeded. Hematemesis and tarry stools depend upon the damming back of the blood in the portal vein; fever is rare; the pulse is small and rapid; emaciation and pallor may be marked or may be masked by the distention of the



vessels in the skin which is characteristic of the alcoholic habit. The skin is usually of a sallow or putty-like color; the flatulent distention of the abdomen may be associated with ascites; jaundice occurs rather late in the disease, if at all, and is rarely pronounced; nervous symptoms rarely appear before the terminal stages, with the onset of stupor or noisy delirium. These symptoms usually terminate within a few hours or a few days in deep coma, which in turn terminates by death from exhaustion, anemia, or heart failure.

The liver dullness is enlarged at first; later, it is markedly diminished. The "hobnails" may be felt on palpation in a very thin patient; the splenic dullness is enlarged, and "caput medusæ" is present.

The urine is scanty, high-colored, of increased density, loaded with urates; the urea is diminished, and blood and other pigments may be present. The blood examination gives little aid; early, there is no change in the red cells; later, there is slight anemia. The leucocytes are normal or low or a moderate leucocytosis may be present. The blood cells may show the effects of the toxemia.

**Treatment.** Structural perversions should be corrected, if the condition of the patient permits—if the disease has not already passed the earlier stages. Raising the ribs is especially good.

Alcohol is to be entirely discontinued; tobacco, spices, tea and coffee are best denied. Excess of meat is harmful. Probably an entire milk diet is best for some days, or until the digestive tract is fairly clean. Otherwise, the diet should preferably be chiefly cellulose—especially green vegetables and fresh fruits. Fats and sugars are contra-indicated.

When ascites is present, dry diet, with absolutely no salt, is advised. Water may be taken in very tiny sips, either hot or cold, or bits of ice may be left to melt in the mouth. Massage and rubbing keep the skin in as good shape as can be; the action of the kidneys is to be watched.

**Prognosis.** Recovery is not to be expected. If the collateral circulation is well established, the atrophy not marked, and the patient willing to live temperately, serious symptoms may not arise for a considerable time. In far-advanced cases, the outlook is grave. Some cases live two to four years; usually about a year after dropsy occurs.

#### BILIARY CIRRHOSIS

In this disease the cirrhosis is the result of a chronic inflammation of the bile ducts. It may originate from cholecystitis and invade the liver by extension from the bile capillaries.

The symptoms are those of chronic cholecystitis followed by a slowly progressive cirrhosis of the hypertrophic type. Within a

few months the apparent hypertrophy is followed by an atrophy and the future course of the disease as well as the treatment is very much like that in alcoholic cirrhosis.

**Bronzed Diabetes** is a rare disease, characterized by bronzing of the skin, marked glycosuria, biliary cirrhosis of the liver, rapid cachexia and death. The supra-renals and the pancreas are also cirrhotic. The diagnosis rests upon the bronzing, glycosuria and enlarged, cirrhotic liver. No treatment is of any avail.

### HYPERTROPHIC CIRRHOSIS

(Hanot's disease; unilobular cirrhosis)

This form of cirrhosis is characterized by the embryonic type of the growth of connective tissue and the very marked round cell infiltration of the new growth. Atrophy occurs rarely if ever in this form; the hyperplasia may be extremely marked.

**Etiology.** This disease is very rare. It mostly affects young adults and children. Several members of the same family are frequently affected. It has no connection with alcoholism. The causative agent is unknown, but there seems to be some toxin which reaches the liver by the general circulation.

**Diagnosis.** The onset is gradual. Jaundice is very early and becomes very severe. Hepatic, splenic, and gastro-intestinal symptoms are at first usually slight and increase in severity. Periodic attacks of severe abdominal pain with nausea and vomiting are frequent. Fever, sometimes to 104° F., may accompany the painful attacks. The symptoms of obstruction of the portal vein do not occur until late in the disease. The course of the disease is slow; death results after several years from toxemia or as the result of complications. The urine contains bile but is otherwise fairly normal. The feces sometimes are normal in color, sometimes pale and are sometimes extremely dark from an excess of bile; this variation is diagnostic. The blood shows a slight leucocytosis, and some signs of secondary anemia. Nervous symptoms are severe and variable.

The symptoms are those of atrophic cirrhosis—the ascites requiring many tapplings. Jaundice is not often present.

**Treatment.** It is of prime importance that the circulation be normalized, if at all possible, by corrective work from the fifth to twelfth dorsal vertebræ. The rib articulations must also be carefully examined and all mal-adjustments found; these must be corrected.

At first, the diet should be restricted to milk, but as the patient becomes better, other light, non-irritating, nourishing foods may be used. Fatty and saccharine foods should be avoided. When there is ascites, a dry diet without salt may be tried. The bowels and



the skin function must be kept active, and the kidneys watched carefully. A quiet, out-door life is best. If all other measures fail, tapping may be used for relief of ascites, or Southey's tubes may be used.

**Prognosis.** The outlook is unfavorable. The course is slow but it is ultimately fatal.

### ABSCESS OF THE LIVER

(Acute purulent hepatitis; parenchymatous hepatitis; suppurative hepatitis)

This is a diffuse or circumscribed inflammation of the liver cells, due to infection by the pyogenic bacteria, and resulting in suppuration. The abscesses may be multiple or single. The disease is characterized clinically by irregular fever, hepatic tenderness and aching, and symptoms of deranged gastro-intestinal and hepatic functions.

**Etiology.** Staphylococci, streptococci, typhoid bacilli, or any other of the usual pyogenic or pathogenic bacteria are direct or indirect agents. These reach the liver by way of the systemic or the portal blood, by extension from neighboring viscera, including the lungs, by perforation of the diaphragm, or by way of the bile ducts. Appendicitis, cholangitis, phlebitis, cholelithiasis, may give origin to the infection. When the infection is carried by the portal vein, the abscesses are usually multiple.

Bony lesions of the mid-thoracic region and the corresponding ribs seem to lower the resistance to infections, in general, and also to interfere reflexly with the nervous and circulatory mechanism of the liver.

**Diagnosis.** There are irregular intermittent or remittent fever, chills and sweats; obstinate vomiting and other gastro-intestinal disturbances; constipation with light colored stools; muddy complexion with sometimes slight jaundice; irritability of the nervous system; melancholia; anemia; leucocytosis; and general symptoms of pyemia or, in marked cases, typhoid symptoms. Pain is variable and often referred to the back, shoulders or other regions. Dull aching over the liver may be noticed.

Locally, the hepatic enlargement is upward, sometimes with circumscribed bulging with pain, tenderness and fluctuation. It frequently ruptures through the diaphragm into the lung, causing empyema.

When the abscess tends to burst externally, the skin over it is hot, red, tender, swollen, and edematous.

**Blood.** During the acute process, leucocytosis may reach 15,000 or even 50,000; later, the count is lower. Occasionally, especially in asthenic persons, normal or subnormal white cell counts may be found. The red cells and the hemoglobin are lowered slightly.

**Urine** shows the characteristics of abscess formation; sometimes an increase of the bile pigments and a diminished uric acid relative to the urea. When nephritis is present, the urinary changes due to this condition are also present.

**LARGE SOLITARY ABSCESS.** Hepatic abscess is due to the presence of the amoeba histolytica more frequently than is perhaps suspected. The diagnosis of this condition must rest upon the history of the case. The leucocyte count in the amoebic abscess is rarely higher than 14,000. The amoebæ may be demonstrated in the pus if a warm stage is used. Vaughn reports one case of a negro man suffering from an amoebic abscess of the liver from whom eight liters of pus were drawn at operation. The man ultimately made a reasonably good recovery. This form may be latent and run a course without definite symptoms; death may occur suddenly from rupture. When there are symptoms, the temperature is elevated and of an intermittent or septic type and decidedly irregular. There is profuse sweating particularly when the patient is asleep.

**Treatment.** Exploratory aspiration should be performed; the region where the enlargement is greatest is the point of election. If not at the point of election, the next best places are: either the lowest interspace in the anterior axillary line; or the seventh interspace in the mid-axillary line.

After this, or when surgery is contra-indicated for any reason, the treatment of the splanchnic and vagus regions, according to conditions as found, gives much relief and hastens recovery. No food or only limited amounts of liquids should be permitted. Cool sponging relieves the fever. Ice bags over the liver relieve the pain.

**Prognosis.** In traumatic and amoebic abscesses when the pus can be evacuated early, a favorable termination may be expected. In pyemic and other forms, a fatal result is to be expected, though recovery may occur.

## HEPATIC CANCER

(Carcinoma of the liver)

Cancer of the liver is most common in late middle life—35 to 55 years. The primary causes are heredity, traumatism, irritation from various causes as gall-stones, and chronic intestinal stasis. The primary form is very rare, and most common in men. It is nearly always secondary; this is most common in women, as metastasis from uterine or mammary cancer.

**Diagnosis.** The symptoms are due to increased size of the liver; pressure on the ducts or terminal portal vessels; and the general effects of cancer—cachexia.

These symptoms include a history of dyspepsia, flatulence and constipation. There are hepatic pain, weight and fullness, increased on pressure; increasing emaciation; jaundice; ascites; occasionally intense hemorrhages; attacks of local peritonitis; malignant



cachexia; anemia; and edema of the feet and legs. Fever may be present towards the close of the disease. In melano-sarcoma, pigmented nodules in the skin may be found; these are pathognomonic. Intermittent pain is due to increased size of the organ and to inflammation of the capsule.

Hepatic dullness is increased. The liver is indurated, irregular in outline, nodulated, sometimes with umbilication of the nodules, is painful on palpation, and the superficial veins of the abdomen are enlarged.

The diagnosis is made by the physical findings; the clinical symptoms, and by the X-ray examination.

**Treatment.** Palliative treatment alone is indicated. The gentle springing of the thoracic spine, relaxation of the reflex muscular contractions, and thorough treatment of the cervical and sub-occipital regions, often give relief. In the terminal stages opiates are often necessary.

**Prognosis.** Death occurs in three to fifteen months, rarely two years, after the condition is recognizable.

## HYDATID CYST OF THE LIVER

(*Echinococcus* of the liver)

Hydatid cyst of the liver is due to invasion and subsequent development of the embryos of the *taenia echinococcus*, which are accidentally ingested with food and drink. The cysts are single or multiple, and most frequently invade the right lobe. The larvæ find their way from the stomach and intestines into the portal circulation and thus reach the liver. They lodge and lose their hooklets, developing into a cyst. The cyst wall contains two layers, the inner of which is the germinal layer from which the daughter-cysts develop. The irritation gives rise to the outer layer of connective tissue.

The cyst contains a clear, non-albuminous fluid, of low specific gravity, rich in chlorides, containing the larvæ, hooklets, and daughter-cysts. It grows slowly and, on the death of the parasite, may undergo inspissation and calcification, or suppuration.

**Diagnosis.** Unless the cyst is large, there are usually no symptoms. There may be a sense of fullness in the hepatic area. Occasionally, jaundice, pain, dyspnea, fever, and pyemic symptoms are present. Reflex muscular contractions are rarely present before rupture or suppuration occur.

The liver is painlessly, irregularly enlarged; fluctuation may be detected in some cases. If the cyst is near the surface, placing one hand over the tumor, and tapping it lightly with the fingers of the other hand will elicit a vibrating or trembling movement (hydatid fremitus or thrill).

Aspiration should always be performed, as the presence of a few hooklets is diagnostic.

Suppuration and rupture are the most common terminations.

**Treatment.** Incision and evacuation of the contents is the best method. Aspiration may be used, but one is not certain of getting all the infecting material.

After this has been done, the gentle relaxation of the reflex muscular contractions, followed, after healing of the surgical wound, by the correction of

such spinal and rib lesions as may be found on examination, hastens complete recovery of health and lessens the danger of subsequent hepatitis.

**Recovery** is to be expected in uncomplicated cases. If there has been infection by pyogenic bacteria, or when the vitality of the patient is low for any reason, recovery may be delayed or impossible.

### AMYLOID LIVER

(Waxy, lardaceous, scrofulous, or albuminous liver)

**Etiology.** Among the causes is prolonged suppuration of tuberculous disease either of the bones or the lungs; next in frequency are the cases associated with syphilis. It is seen in coxalgia, rachitis, cancer, leukemia, and certain infectious diseases. The deposit begins in the arterioles and capillaries and spreads to the fibrous tissue and parenchyma. Other viscera are affected.

**Diagnosis.** There are no characteristic symptoms. Pain is absent. Disorders of digestion, diarrhea, emaciation, and anemia are common. The hepatic dullness is enormously increased and there is prominence of the liver area. On palpation, the liver is firm, smooth on the surface, not tender, the edges rounded or sharp and hard. The urine is increased in amount, pale, albuminous and contains amyloid casts when the kidneys are involved. The treatment and prognosis are those of the primary disease.

### FATTY LIVER

Two conditions are included under this head: fatty infiltration, or excessive accumulations of fat-globules in the hepatic cells; and fatty degeneration, in which the cell protoplasm is partially replaced by fat. The first is most common in obesity and in conditions in which the oxidation processes are interfered with, as in cancerous, syphilitic or malarial cachexia, primary or severe secondary anemias, and phthisis. The second is more often the result of bacterial or other toxins, as the acute infections, alcoholism; poisoning by phosphorus, chloroform, and other chemicals; and in combination with such other diseases as cirrhosis, amyloid disease, passive congestion, pernicious anemia, chronic dysentery, etc.; it is sometimes found in pregnancy.

**Diagnosis.** Any symptoms present are due to the causative disease. Pallor is marked; the face may be swollen; and the ankles may be slightly edematous. The liver is uniformly and sometimes markedly enlarged; is somewhat soft, regular in outline, and with rounded edges. The stools are pale but bile is not absent.

The urine is albuminous, abundant and of moderate specific gravity. The urinary and blood changes may show the primary disease.

The treatment and prognosis are those of the primary disease.



## CHAPTER X

### DISEASES OF THE GALL-BLADDER AND BILE DUCTS

#### CHOLANGITIS

(Angiocholitis; catarrhal jaundice; catarrh of the bile-ducts; hepatogenous jaundice; duodeno-cholangitis)

Acute cholangitis is inflammation of the lower end of the common duct, associated with catarrh of the stomach and duodenum and produced by the same causes; clinically marked by jaundice.

**Etiology.** The main predisposing causes are: excesses in eating and drinking; exposure; debauch; physical fatigue; passive hepatic congestion; and certain infectious diseases.

Lesions of the right lower ribs, and of the sixth to the tenth thoracic vertebræ are usually present. Cervical lesions are less constant.

**Diagnosis.** Sometimes the yellow tint of the skin is the first symptom noticed. Often, it begins with epigastric distress, nausea, perhaps vomiting, looseness of the bowels, and slight feverishness, sometimes to 101° or 102° F.

In three to five days, the skin and sclera become yellow, never bronzed; the fever disappears; the skin becomes harsh, dry, and itchy; the bowels constipated, the stools whitish or clay-colored and accompanied by much flatus and colicky pains. Jaundice may be marked, the skin cold; the heart action and respiration slow; the mind torpid and greatly depressed; if much pain is present, some complicating factor should be suspected. The depression, discoloration, and bowel condition persist for one or two weeks after the more acute symptoms disappear. The liver and spleen are slightly enlarged.

Tenderness may be manifested on pressure over the bile-duct area, at the end of the ninth costal cartilage. The urine is heavy and dark, loaded with urates and containing bile pigments and bile acids.

Leucocytosis is moderate. Both red and white cells may show the effects of toxic influences.

**Treatment.** Attention must be paid to any subluxations which may interfere with a good blood supply to the part affected. The ninth thoracic vertebra, the right tenth rib, and neighboring tissues should receive careful attention.

The gastro-intestinal condition must be treated according to the findings in each patient.

The diet should be carefully regulated, especially as to quantity. Fruit and vegetable juices, diluted with hot or cold water, are good. Irrigation of the colon with cool water (80°-90° F.) has been advised. The stools must be carefully watched.

**Prognosis.** If there are no complications recovery occurs in from two weeks to several months. When the condition persists longer than three months, more serious trouble should be suspected.

### CHRONIC CATARRHAL CHOLANGITIS

Chronic catarrhal cholangitis may occur as a sequel to an acute attack of cholangitis. The common duct may be completely or only partly obstructed. With complete obstruction of the common duct the bile passages are greatly dilated; there is usually dilatation of the gall-bladder and of the ducts within the liver; the contents of the ducts and the gall-bladder are a clear, colorless, usually sterile mucus. These patients are the subjects of chronic jaundice without fever.

With incomplete obstruction of the common duct there is either pressure on the duct or gall-stones in the common duct or in the ampulla of Vater; the bile passages are not much dilated and the contents are bile-stained turbid mucus. There may be a "ball-valve" obstruction. This form is associated with the so-called hepatic intermittent fever (103° to 105° F.) with recurring attacks of chills, fever, and sweating.

The treatment is practically that of cholelithiasis.

### SUPPURATIVE CHOLANGITIS

(Purulent angiocholitis)

Suppurative cholangitis usually involves the common duct, and is characterized by septic phenomena. The usual cause is gall-stones in the common duct. Cancer, lumbricoides, or other foreign bodies occasionally are causative.

**Diagnosis.** There is a history of attacks of biliary colic, then a period with no attacks, then later attacks of temporary jaundice, a recent one being followed by chill, fever, jaundice varying in intensity, slight or severe pain, progressive emaciation and loss of strength. There may be nausea and vomiting, or "intermittent hepatic fever." There is a smooth, tender, moderate enlargement of the liver, with tenderness over the gall-bladder or in the epigastrium.

There is "a tender area in the region of the twelfth dorsal vertebra, two or three centimeters from the median line."—Boas.

**Treatment.** Surgery is indicated. Cholecystectomy with free and prolonged drainage, any gall-stones found being removed, is



the preferred method. The later treatment is practically that of cholelithiasis (q. v.).

**Prognosis.** The condition is always grave and is generally fatal, unless operation is early performed. Spontaneous evacuation into the intestine may occur. Rupture into the peritoneum is more probable, when speedy death is to be expected.

## CHOLECYSTITIS

(Acute infectious cholecystitis)

Cholecystitis is an acute inflammation of the gall-bladder. It may be catarrhal, membranous, suppurative, phlegmonous, or gangrenous in type. The inflammation is usually due to bacterial infection by extension from neighboring parts, and it is characterized by fever, tenderness and pain in the right hypochondrium near the end of the ninth costal cartilage.

**Etiology.** The organisms most commonly found are those of the colon group, bacillus typhosus, pyogenic cocci, and the pneumococcus. Parasites and calculi in the gall-bladder occasionally act as causes.

Subluxations of the vertebræ from the fifth to twelfth dorsal and the lower four ribs play a part in lowering the resistance to pathogenic bacteria. Lesions of the right tenth, eleventh and twelfth ribs are especially important.

The gall-bladder is distended and the cystic duct often closed by swelling of its mucous membrane.

**Diagnosis.** The onset is abrupt and severe, with increased temperature and pulse rate, severe paroxysmal pain and extreme tenderness in the right hypochondrium at the ninth costal cartilage (sometimes referred to some other location). Vomiting is common; prostration is usually well marked or severe; jaundice is present or absent; there may be obstinate constipation. If pus forms, the whole condition becomes septic, and perforation may occur. In the phlegmonous form, besides the usual symptoms, there is high temperature with extreme prostration, and the rapid development of the typhoid state. Peritonitis rapidly ensues.

A tender tumor composed of the gall-bladder may be palpated. Spasm of the right rectus muscle is usually present.

**Urinary** changes are those usual in febrile states. With occlusion of the duct, the bile pigments and salts appear in the urine.

Leucocytosis is invariably marked—20,000 to 30,000.

The condition may be confused with appendicitis, congestion of the liver, syphilis of the liver, single or multiple abscesses of the liver, pyelophlebitis, subphrenic abscess, pancreatic disease,

perforation of gastric or duodenal ulcer, intestinal obstruction, and uremia.

**Treatment.** This is palliative and surgical.

Correction of subluxations of whatever character found, which result in lowered tissue resistance, and which interfere with arterial and venous exchange in the affected part, are essential factors of treatment. In surgical cases this corrective work should follow the healing of the wound.

The diet must be restricted to water during the attack. Return to ordinary food should be gradual.

Hot applications over the liver area lessen the pain.

**Prognosis.** Mild cases terminate in recovery. Suppurative cases are unfavorable, tending toward a fatal termination.

Among the sequelæ may be mentioned serous distention and empyema of the gall-bladder and chronic cholecystitis.

### GALL-STONES

(Cholelithiasis; biliary or hepatic calculi; biliary or hepatic colic)

Gall-stones are concretions of material which has been deposited from the bile; this is most often cholesterin, and usually a nidus of bacteria or mucin is present. Gall-stones may be either single or multiple.

**Etiology.** The predisposing causes are excessive eating, especially of the carbohydrates, tight lacing, sedentary occupation, insufficient exercise, constipation, typhoid and other infections, enteroptosis, and many other conditions favoring stagnation of the bile. Pregnancy seems to have an influence, as 90% of cases are in women who have borne children.

**Subluxations** of the lower four ribs and the corresponding vertebrae produce conditions which result in lessened peristalsis and disturbed circulation and secretion, thus causing a mild and chronic catarrh of the mucosa of the gall-bladder and the smaller bile ducts.

They are formed around a nucleus of epithelial, mucoid, or more frequently, bacterial character. The bacteria are those of the colon group, especially the bacillus coli, and the bacillus typhosus; rarely the less virulent of the pyogenic organisms are thus found.

The calculi may be single or multiple. When single, they are usually ovoid in shape; if composed of pure cholesterin, they are light, glistening, with a granulated surface. More commonly, they are multiple and faceted from pressure of their opposing surfaces.

In composition, ordinary gall-stones consist chiefly of cholesterin arranged in laminae, with a nucleus of bile-pigment. They also contain salts of calcium and magnesium. Externally, they may be yellow or brown and have a greasy surface when fresh. The number varies from one to several hundreds.

**Diagnosis.** Symptoms of chronic catarrhal cholecystitis or cholangitis often precede recognizable symptoms of gall-stones.



These include constipation and other gastro-intestinal symptoms, uneasy sensations in the epigastrium or right hypochondrium, deep-seated tenderness over the gall-bladder, sallowness of the skin, slight yellowing of the conjunctivae. The scanty urine is rich in uric acid and later contains bile. If the stones pass into the bowel without pain, the symptoms disappear temporarily.

Diagnosis by the X-ray is usually satisfactory. Calcium stones show plainly; cholesterin stones rarely cast a shadow, but the evidences of inflammation are evident, so the diagnosis becomes evident. Stereoscopic views give much clearer definition in these cases.

**Biliary colic** gives rise to the following main symptoms: Sudden and excruciating pain, usually paroxysmal, beginning in the epigastrium or right hypochondrium; often with a palpably enlarged gall-bladder. This pain is due partly to the slow progress in the cystic duct (when the stone must take a rotary course), partly to the acute inflammation accompanying the attack; and partly to the stretching and distention of the gall-bladder by the retained secretions.

Shivering, profuse sweating, great feebleness of the pulse, and symptoms of collapse are frequent. The temperature may be normal or subnormal. Slight fever is due to concomitant acute cholecystitis.

Reflex vomiting often gives some relief. Jaundice, arising sometimes in a few hours, sometimes several days, after the onset of the pain, and persisting for a few days after the pain is relieved, is due to the stone lodging in the common duct.

The attack lasts from three to twelve hours but a rapid succession of attacks may keep the patient in almost continuous pain for several days. The pain ends suddenly when the stone slips into the bowel but tenderness and prostration continue for several days.

The feces should be examined carefully for the calculi. Serious complications may arise from rupture of the duct with fatal peritonitis; fatal syncope; convulsions; or impacted gall-stones.

**Impacted Gall-Stones.** Instead of passing into the duodenum, the stone may remain in the gall-bladder or be impacted in the cystic duct or the common duct. If in the cystic duct the resulting dropsy of the gall-bladder can be felt as a smooth, movable, ovoid tumor beneath the ninth costal cartilage. When the obstruction is chronic, the contents of the tumor are clear mucus. Gall-stone crepitus may be perceived.

Cholecystitis, simple or suppurative, may occur, the latter (empyema of the gall-bladder) being the most common. Atrophy of the gall-bladder may be a sequel.

If the stone is impacted in the common duct permanent jaundice follows; there is the persistent or intermittent presence of bile

in stool; fever and enlargement of the spleen. If the obstruction is partial so that the stone acts like a ball-valve, the jaundice varies in intensity, there are recurrent attacks of colic with the so-called hepatic intermittent fever (rigors, pyrexia, sweating). The jaundice deepens with each attack.

Calculus in the gall-bladder sometimes causes acute cholecystitis, or leads to ulceration with the establishment of a biliary fistula opening into the duodenum, colon, or other hollow viscus, or occasionally on the skin. A large stone passing through such an opening may cause obstruction of the bowel.

On examination is found tenderness and rigidity at the ninth costal cartilage which may extend over the abdomen; contractions and hypersensitive areas along the spine from the sixth to the tenth dorsal are constant.

**Urine.** There is albumin with red blood cells. As soon as a stone is passed the patient may pass a large quantity of clear, pale urine. When jaundice is present, bile elements are found.

**Blood.** There is a mild leucocytosis during an attack. The coagulation time may be slow and should be tested before any operation upon the gall-bladder, or in the presence of jaundice.

**Treatment.** "A careful physical examination from the point of the ninth costal cartilage along a line passing through a point about one inch to the right of the umbilicus should be made with the patient lying upon his back and with knees flexed to relax the abdominal structures. The fingers of the operator must be laid flat, and if necessary, the right hand may be reinforced by the left. The pressure must be light, yet firm. If there should be any accumulation whatever in the duct a light pressure will reveal a tender spot. The feeling at this spot will vary in intensity from a dull pain to a sharp pricking, lancinating sensation. As the patient expresses: 'It feels as though you had a tack on the end of your fingers.' With careful manipulation along the course of the duct the concretion is gradually moved along and passed through the ductus communis choledochus into the intestine where it can do no more harm."—Jenette H. Bolles.

Preventive measures after an attack are most important. Correction of bony lesions as found is the most essential factor in prophylaxis. Regular systematic exercise, avoidance of tight belts and corsets, and better posture all are efficient aids.

"If after a faithful attempt to cure and our efforts are not rewarded, then many of these cases should be operated and the gall-bladder drained. If the attacks of simple gall-bladder disease are accompanied by high temperature and chills which indicate the presence of infection, the case has already passed into the domain of surgery and should be operated at once. Should the pain be paroxysmal, excruciating and accompanied by jaundice, the case has passed the borderline of conservative therapy and should be operated. The conscientious physician avoids the radical agency of therapy studiously when he is in

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doubt as to the appropriateness of its application in that particular case; but when he is convinced it is the right thing to do, he summons it to his aid at once and assumes his due measure of responsibility. The mere presence of gall-stones in the gall-bladder is no particular indication for an operation. Surgery should be commanded only when the stones give trouble by inducing infection or when manipulative measures do not enable them to pass. Fortunately for the patient some twenty-five per cent of the cases of gall-stones in the gall-bladder do not produce any symptoms whatsoever."—S. L. Taylor.

"To relieve the pain, inhibition in the splanchnic area, especially at the ninth and tenth, also apply heat to the splanchnic area and over the region of the gall-bladder to hasten relaxation. Gentle manipulations over the region of the gall-bladder and ducts may help considerably. Of course you cannot get your fingers on the ducts and push the stone through, but manipulations over the gall-bladder may, if the bladder is full of bile, cause the stone to be pushed into the duct and passed. Then give good, vigorous treatment to the lower dorsal and upper lumbar regions for a few minutes, allow the patient to rest several minutes and again repeat until the pain is reduced by the stone passing or dropping back into the bladder. The spinal and abdominal muscles must be thoroughly relaxed."—J. E. Derck.

The control of the diet is most important. The patient must avoid excess in eating, keeping the fats and carbohydrates at the lowest limit necessary to keep the body nourished. Water drinking must be encouraged.

Recurrent attacks and complications which do not yield to treatment may call for cholecystotomy or cholecystectomy as may be indicated. The indications for operation are: repeated attacks of biliary colic; the presence of a distended gall-bladder with severe and resistant attacks of pain and fever; gall-stone impaction in the common duct.

Among the *sequelæ* are biliary fistulæ and obstruction of the bowels by gall-stones. Malignancy may follow the repeated irritation.

**Prognosis.** Uncomplicated cases terminate in recovery. Ulceration, suppuration, or perforation may be fatal.

## CANCER OF THE GALL-BLADDER AND OF THE BILE DUCTS

Cancer may affect either the gall-bladder or the bile ducts and in about 85% of the cases follows gall-stones. About 75% are in women. It may begin either at the fundus or near the neck of the gall-bladder. The liver may be affected secondarily, in which case the progress of the disease is rapid. Secondary growths are not common.

**Diagnosis.** The pain is severe and often paroxysmal, with persistence and tenderness on pressure in the intervals between attacks.

When the gall-bladder is affected, jaundice usually occurs rather late. If the bile ducts are implicated, it is present from the

first and becomes progressively deeper, the pain being absent or slight. Cachexia, progressive emaciation, and profound anemia are present.

The tumor is firm, hard, nodular, and very tender on pressure. If the growth involves the gall-bladder, it extends diagonally downward and inward toward the umbilicus; if the bile ducts are involved, it may be felt as a smooth, ovoid swelling below the ninth costal cartilage.

**Treatment.** Is palliative at best. Surgery may stay the progress for a time. Deep, steady pressure over the spinal areas of greatest reflex contraction and frequent and thorough treatment of the cervical tissues may give great relief. At the last, opiates are often necessary for the relief of the pain.

**Prognosis.** Death is not as speedy as in cancer of the liver, but is inevitable, under our present methods of diagnosis. If early diagnosis could be made, as, for example, at an operation for gall-stones, no doubt early surgical intervention could give fairly good prognosis. After opiates or other analgesic drugs become necessary, these add complicating discomforts and themselves make the prognosis more gloomy. Life may, however, be prolonged and be made endurable by the use of these, during the last weeks of the disease.

**Prophylaxis.** Since so large a proportion of these cancers follow gall-stones, tight lacing, and rib lesions, the prevention of this triad is important.



## CHAPTER XI

### DISEASES OF THE PANCREAS

#### GENERAL DISCUSSION

Diseases of the pancreas are rather rarely reported. This is partly due to the protected location of this gland, and partly to the difficulties in diagnosis, when pancreatic disease does occur. The pancreas pours its secretion into the duodenum through a rather long and tortuous duct; infectious agents do not readily reach the gland from the intestine. Slight variations in either its internal or its external secretion do not cause any recognizable variations in the digestion of the food, nor in carbohydrate metabolism. The nervous relations of the pancreas are practically the same as those of the liver and the upper intestinal tract. For this reason, reflex muscular contractions and hypersensitive areas do not give help in diagnosis. With more efficient methods of diagnosis no doubt many obscure cases will be recognized as due to pancreatic disease. At the present time, no functional pancreatic diseases are recognized.

#### HEMORRHAGE INTO THE PANCREAS

This usually occurs in individuals over forty years of age, but seemingly bears no relation to work or rest. Chronic alcoholism is a predisposing factor in some cases.

**Diagnosis.** Slight hemorrhages may cause no recognizable disturbance and only be found post-mortem.

Hemorrhage is characterized by the sudden onset, usually during perfect health, of a severe, sharp or colicky pain in the upper abdomen, accompanied by nausea and obstinate vomiting. The patient becomes depressed, restless, and anxious, with a cold, sweating skin. The pulse is small and rapid, becoming later running and imperceptible. The temperature is normal or subnormal. The abdomen rapidly becomes distended and tender over its upper portion. Collapse, syncope; and death usually supervene within twenty-four hours.

**Treatment.** Palliative measures are indicated, as in shock. The diagnosis becoming apparent, exploratory laparotomy may show some reparable injury. Without surgical intervention, death is inevitable when the hemorrhage is large enough to provoke recognizable symptoms.

## ACUTE PANCREATITIS

Acute pancreatitis is an acute inflammation of the pancreas, either hemorrhagic, gangrenous, or suppurative in character, affecting primarily the fibrous and fatty interstitial tissues, due to extension of disease from the duodenum or to traumatism, and characterized by sudden severe abdominal pain and vomiting; fatty stools, abdominal distention in the upper left quadrant, and rapidly supervening symptoms of collapse.

**Etiology.** The disease occurs in overfat males after forty-five years, especially those suffering from gastro-intestinal disorders, infectious cholecystitis, cholelithiasis, and infectious fevers; or occurs from traumatism, especially blows in the middle of the back. Alcoholism and chronic mercurialism predispose to the disease.

**Diagnosis.** There is a sudden onset with intense abdominal pain and tenderness in the epigastrium, nausea, and vomiting with severe retching. Premonitory pain around the gall-bladder has been reported. The upper left quadrant of the abdomen becomes distended and tympanitic. The temperature is subnormal at first, later moderate fever may be ushered in with a chill. Constipation, dyspnea, jaundice, delirium and hiccough with symptoms of collapse rapidly follow. The patient succumbs, as a rule, within four days.

If there are chills, fever, marked abdominal distention, tenderness, and tympany with jaundice, collapse following the pain or vomiting, it indicates a termination by gangrene.

If there are irregular fever, irregular vomiting, jaundice, and constipation, the indications are that suppuration is in progress and will terminate by death within one to four weeks; or by becoming chronic, the course lasting several months or a year.

The spine may show muscular contractions and subluxations along the lower dorsal and upper lumbar region. The upper left quadrant of the abdomen is distended and tympanitic; tender points due to fat necrosis may be found scattered over the abdomen.

The fat-splitting ferment may be found in the urine, and the ethereal sulphates are reduced. Albuminuria is frequent. The feces contain much fat.

The condition is difficult to distinguish from intestinal obstruction, perforation of the stomach, acute toxic gastritis, and biliary colic.

**Treatment.** Palliation of the symptoms is all that can be done in most cases. Exploratory laparotomy is sometimes indicated.

**Prognosis.** Death usually occurs in from two days to four weeks.



### CHRONIC PANCREATITIS

Chronic pancreatitis is a condition of interstitial overgrowth producing increased size and density, compression of the secreting structure, pigmentary deposits, and calculi in the ducts, and marked clinically by fatty stools, jaundice, dyspepsia, and loss of weight.

**Etiology.** Arteriosclerosis, alcoholism, and syphilis are predisposing causes. Among the exciting factors may be mentioned obstruction of the pancreatic duct, extension of disease from chronic gastro-duodenitis or catarrh of the bile passages, and diabetes. Lesions of the eighth to the tenth vertebræ and ribs modify the circulation of the pancreas.

The anatomic changes are of two forms, interlobular and inter-acinar. The latter invades the islands of Langerhans. Cysts and calculi may be formed in the ducts.

**Diagnosis.** The main symptoms are paroxysmal pain, abdominal distention, indigestion, loss of weight, diarrhea with fatty stools, irregular fever, and jaundice.

The distended abdomen may be found tender in the upper part. There may be albuminuria, glycosuria in various combinations, and the ethereal sulphates in the urine are reduced.

The stools contain much fat, are often clay-colored, and have a large muscle fiber content when meat is eaten. The X-ray may help in diagnosis by excluding certain gastro-intestinal diseases.

**Treatment.** If calculi or gall-stones are the cause, operation is indicated. Alcoholic, syphilitic and arterio-sclerotic cases should receive suitable treatment for these conditions. In all cases, treatment for the correction of the bony lesions as found, is indicated.

**Prognosis.** The course of the disease is very slow. The appearance of glycosuria makes the outlook grave.

### PANCREATIC CYSTS

Pancreatic cysts are usually retention cysts, due to closure of duct of Wirsung by concretions, tumors, or cicatrices, and may result from the encapsulation of extravasated blood, echinococcus disease, malignant tumors, or may be congenital.

Trauma and inflammation are important factors of etiology.

**Diagnosis.** The main symptom is progressive enlargement of the left portion of the epigastrium between the costal cartilages and the median line. The general symptoms of abdominal pain, digestive disturbances, emaciation, constipation, recurring intestinal hemorrhages, with pressure symptoms of jaundice, ascites, or dyspnea, occur only when the tumor is of some considerable size and are dependent upon the location to a considerable degree.

The complexion is peculiar. The skin has a dirty yellowish or earthy hue.

Inflation of the stomach and colon shows that the tumor lies behind them. It is found to be globular, resisting, inelastic, nonfluctuant, dull to percussion, and may displace other organs and structures.

On aspiration, the fluid found is reddish or dark brown color; contains blood or blood coloring matters; cell detritus; fat granules; and sometimes cholesterin; its consistency is usually mucoid, rarely thin; of alkaline reaction; specific gravity is 1010 to 1020; the pancreatic ferments are present in variable number and proportions. The most important test to be made is for the digestion of fibrin and albumin.

Glycosuria and albuminuria are usually present. Feces contain considerable fat.

**Treatment.** After the withdrawal of the characteristic fluid by aspiration, exploratory incision is indicated. Recovery is to be expected in the absence of complications.

### CANCER OF THE PANCREAS

Cancer of the pancreas occurs as a primary form, usually of the scirrhus variety, affecting first the head of the pancreas, and is characterized clinically by dull epigastric pain, intense, persistent jaundice, tumor formation, clay-colored, greasy stools, various pressure symptoms, and very rapid wasting and cachexia. Secondary cancer is more rare.

**Etiology.** Men are more often affected; the disease is most apt to appear after the age of forty.

**Diagnosis.** The symptoms are suggestive; other methods of examination are very unsatisfactory. X-ray sometimes helps in the diagnosis. The symptoms include: obstinate chronic or recurring gastritis, with atypical symptoms and gastric findings; progressive cachexia; dull, obstinate epigastric pain; sometimes nocturnal paroxysms of extremely severe pain, with vomiting and diarrhea, sometimes associated with intercurrent constipation. Intense and persistent jaundice may be due to pressure upon the bile duct. Pressure upon the portal vein may be responsible for ascites; pressure upon the thoracic duct may cause chylous ascites and chyluria; this may simulate certain tropical diseases. Pressure upon the vena cava may cause edema of the legs and abdomen. Pressure upon the duodenum may cause signs of acute intestinal obstruction; less degree of pressure may cause gastrectasis. Aortic pulsation is readily transmitted.

The stools are apt to be greasy and clay-colored. Undigested meat may be found in the nondiarrheic stools. Various tests for the efficiency of the pancreas have been described; these are based upon the relative digestibility of different food materials by the digestive juices. Glycosuria may be present. Other urinary and blood findings are about as in cancer elsewhere in the body. In emaciated patients the tumor may be felt.

Metastasis to the liver and spleen are frequent; to other organs, occasionally.

**Treatment.** Only palliative treatment is possible. Relaxation of the reflex muscular contractions, with or without correction of



the bony lesions, gives relief, and prolongs comfortable existence to a certain extent. These cancers are inoperable by the time the diagnosis is possible.

**Prognosis.** Very rarely early diagnosis and removal of the cancer are possible; life may be prolonged even though recurrences are to be expected. When the metastases in the liver give the first recognizable symptoms, as is often the case, death is not long delayed. Palliative measures are usually even more inefficient in these cases than in other cancers of the upper abdominal region.

### PANCREATIC CALCULI

(Pancreatic lithiasis)

Pancreatic calculi are multiple, pea-sized, inspissated particles of altered pancreatic secretion around which concretions of calcium carbonate and phosphate have been laid and are found in the pancreatic duct, and its branches. Inflammations of the gland, or influences which caused altered secretions, are factors of etiology.

They are often unattended by symptoms being found only at autopsy. When symptoms arise, usually resulting from closure of the ducts, or passage of the stones, the condition resembles biliary colic. Glycosuria, fatty stools, and the passage of the calculi by bowel may lead to correct diagnosis. X-ray examination is usually decisive.

The methods given for biliary colic are to be used during the passage of stones. Surgical removal may be indicated after careful study of X-ray plates.

## CHAPTER XII

### DISEASES OF THE PERITONEUM

#### GENERAL DISCUSSION

The peritoneum is subject to diseases which originate elsewhere—as in perforation, extension of inflammation, metastases of malignant growths, and other conditions of similar nature. The visceral layer of peritoneum is almost or quite devoid of sensory nerves; the parietal layer is plentifully supplied with sensory nerves. This accounts for the observed fact that inflammatory processes limited to the visceral layer cause little or no pain, and usually no recognizable reflex muscular contractions, whereas comparatively slight involvement of the parietal layer causes severe pain and marked reflex muscular contractions in the lower thoracic and lumbar spinal muscles, as well as in the abdominal muscles. It must not be forgotten that the intestinal tract is fairly well supplied with sensory nerves, and that intestinal inflammations do produce pain and reflex contractions.

The vasomotor nerves of the peritoneum have not been well studied. The blood supply to the peritoneum itself is not especially abundant, though many large vessels pass through its folds. The endothelial layer of cells acts as a secretory membrane, and the factors which modify this secretion have not yet been well studied. Variations in this secretion seem to be due to variations in the circulation, yet circulatory phenomena do not seem to account for all the variations in the formation of the peritoneal fluid.

#### ASCITES

(Peritoneal dropsy; hydroperitoneum)

Ascites or dropsy of the peritoneum is a symptom of some condition which causes an increased transudation of fluid into the peritoneal cavity. It is characterized by a distended abdomen, fluctuation, dullness on percussion, displacement of organs and dyspnea, plus the symptoms of its cause.

**Etiology.** Local causes are: Portal obstruction, either within or outside of the liver, as cirrhosis and congestion; neoplasms of the liver and pancreas; thrombosis of the portal vein; chronic peritonitis, simple, malignant, or tuberculous. It may be secondary to malignant disease in connection with the intestine and other abdominal organs. Among the general causes are renal, cardiac, or respiratory disease or anemia.



**Diagnosis.** Enlargement of the abdomen is most marked in the flanks when the patient is lying on his back; the skin is tense and shiny with dilated superficial veins on the surface. The umbilicus is prominent. Fluctuation and a thrill transmitted to the examining hand laid flat upon one flank when the opposite flank is tapped by the finger are characteristic. Percussion yields a dull note which alters when the patient changes position.

The general symptoms include constipation, scanty urination, and embarrassed respiration and cardiac action.

In noninflammatory cases the ascitic fluid is light yellow or straw-colored; specific gravity, 1010 to 1015, contains albumin, 2.5 per cent or less. In peritonitis, the fluid has a specific gravity of 1018 or more and 4.5 per cent and over of albumin.

In chylous ascites, the fluid is turbid and milky, exhibiting oil globules. In malignant ascites, it is often dark from blood, and cancer cells may be found under the microscope. The fluid in tuberculosis may also be hemorrhagic.

**Treatment.** The main treatment is that of the primary disease. Osteopathic work in the lower dorsal and lumbar regions is urgently indicated. Improve the general health by all means at command.

The bowels and kidneys must be kept active by the usual methods. Sweating may relieve the condition.

A dry diet is best. The amount of fluids taken into the body is to be carefully determined for each patient.

If the symptoms of pressure or dyspnea are at all severe, the fluid may be evacuated by Southey's tubes or by aspiration. Paracentesis may be repeated many times, if asepsis is observed. The abdomen must be supported by bandages, gradually tightened during the removal of the fluid, as its sudden removal causes the vessels to become engorged with blood.

**Prognosis.** If the ascites is due to organic disease the prospect is unfavorable. In peritoneal cases the outlook is more favorable. In the rare idiopathic cases recovery is the rule within a few weeks.

## ACUTE PERITONITIS

(Inflammation of the peritoneum)

Acute peritonitis is an acute inflammation of the peritoneum. It is rarely primary, usually secondary to pathological changes of the abdominal, pelvic, or thoracic viscera.

**Etiology.** The main causes of peritonitis are bacterial infection; extension of inflammation from neighboring organs, especially the pelvic organs; strangulations of the bowel; penetrating wounds; severe injuries to the dorsal or lumbar spine and to

the lower three or four ribs; cold and exposure; and those cases occurring secondary to perforation of an abdominal viscus. Almost any of the pathogenic organisms may be involved. *Bacillus coli communis*, tubercle bacillus, gonococcus, pneumococcus, bacillus typhosis, anthrax, and the streptococcus, staphylococcus and indeed any pyogenic bacteria may be found, either alone or in various combinations. Amebic infection may occur.

**Pathology.** The typical changes are: Hyperemia with loss of luster, most marked where the intestinal coils are not in close contact with one another; followed by fibrinous exudation, giving a more or less shaggy appearance; effusion of fluid which may be highly fibrinous and coagulate easily, forming extensive adhesions or may become purulent.

**Acute Localized Peritonitis** may be appendicular or pelvic, originating in the Fallopian tubes or uterus, or may implicate the cavity of the lesser peritoneum (subphrenic peritonitis). Pulmonary or pleuritic abscess may penetrate the diaphragm. It may follow direct injury, but usually is due to disease of some abdominal organ, most commonly resulting from perforation of a gastric ulcer. Local signs are usually associated with hectic fever, sweating, rigors, and emaciation.

**Diagnosis.** The symptoms of acute general peritonitis are most characteristic. Great pain and tenderness over the abdomen is constant; the tenderness may be so marked that the slightest touch causes exquisite agony. The abdomen is tense, rigid and tympanitic. Respiration is shallow and thoracic, 30 to 40 per minute. Pulse is wiry and incompressible, 100 to 150 per minute. The temperature is usually  $101^{\circ}$  to  $103^{\circ}$  F., rarely rising suddenly to higher points. Rarely a subnormal temperature is found. The face is pale, pinched, and anxious in expression. Constipation is common; rarely there are diarrheal attacks. There is persistent vomiting of greenish fluid after the stomach contents and the contents of the duodenum have been passed. Hiccoughs may be very annoying. The tongue is usually small and red. Moderate uniform abdominal distention; increased resistance, absence of visible peristalsis, and later, dullness in the flanks from fluid effusion are constant.

In perforative peritonitis, the abdomen may be tympanitic all over, the hepatic and splenic flexures being completely obliterated. Partial obliteration of the hepatic dullness may be due to meteorism. Spasm of the muscle overlying the primary inflammatory focus is a valuable indication of the source of infection.

The muscles of the dorsal and lumbar regions are found to be tensely contracted. Various subluxations may be found; these are probably accidental or secondary.

The urine is scanty, highly colored, containing an excess of indican.

**Treatment.** Absolute rest and good nursing are essential. Deep, steady pressure in the dorsal and lumbar spinal regions will relieve some of the pain. Relaxation of the spinal and cervical

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muscles will lessen the amount of reflex irritation. The bowels must be cleaned out and kept active.

To further alleviate the pain, local applications of either heat or cold may be used. With much shock or collapse, an intravenous or subcutaneous injection of normal saline may be used with good result.

"Gastric lavage should be used to control vomiting; no food or water is to be given by mouth until the acute condition is mitigated. Proctoclysis should be continued in severe cases, intermittent in milder ones. In the presence of septic material in the peritoneal cavity, surgery is imperative. Nutrient enemas may be employed."—C. A. Champlain.

**Diet.** If there is much vomiting, ice may be given. Either an absolute fast, in well-nourished patients or peptonized milk, light gruels, albumen water, or beef juice in very small amounts for asthenic cases, is advisable.

If there is reason to suspect perforation, strangulation, or other operable disease, speedy surgery is indicated. Exploratory laparotomy is often justifiable.

The **prognosis** depends on the cause; perforation may be fatal within a few hours, the prospect of recovery is in reverse ratio to the amount of delay in operating; septic cases are usually fatal within a week; if the process is localized, the outlook is more favorable.

## SUBPHRENIC PERITONITIS

Subphrenic peritonitis is inflammation of the peritoneum covering the right and left lobes of the liver, or the lesser cavity of the peritoneum, together with that of the adjacent portions of the diaphragm. It is usually suppurative.

**Etiology.** The main causes are: Perforation of a gastric ulcer; upward extension of appendicitis; perforation of the duodenal ulcer; extension of pneumonic infection; perforation of an empyema through the diaphragm; malignant disease of the stomach and liver; rupture of hepatic, perinephritic, or pancreatic abscess; diseases of the gall-bladder; trauma.

**Diagnosis.** The onset is abrupt, especially if due to perforation of an ulcer, with severe epigastric or hypochondriac pain and tenderness, vomiting of bile-stained, sometimes bloody fluid; rapid, embarrassed or painful respiration. Soon after, indications of sepsis supervene. Later, the abscess may perforate into the pleural cavity through the diaphragm, and establish a communication with the bronchus producing a severe, paroxysmal cough and profuse purulent expectoration.

The physical signs are often extremely perplexing. When on the right side, there may be visible bulging, deficient motility in the right hypochondrium, the liver being pushed downward, and

with an apparent vertical and upward increase of hepatic dullness to, perhaps, the fourth rib. If the abscess contains air, there will be a tympanitic zone between the liver dullness and the pulmonic resonance. Change of position of the patient alters the line of dullness. Succussion sounds may be elicited.

When the abscess is in the lesser peritoneal cavity the signs are found upon the left side. If it contains a large quantity of pus, a tumor may be found in the left hypochondrium, epigastrium, or the umbilical region. The colon invariably lies below the tumor and never in front of or above it.

The diagnosis is made mainly by the physical signs, coupled with the history. The earliest symptom is upper abdominal pain of severe character, and vomiting.

In suspected cases, aspiration should be done in the seventh or eighth interspace in the midaxillary line.

If the fluid flows more freely during inspiration, the indications are that it is the subphrenic abscess, because the intra-abdominal pressure is increased during inspiration.

**Treatment.** Prompt drainage, followed by rest and the treatment for local peritonitis should give fair prognosis for recovery.

### CHRONIC PERITONITIS

Chronic peritonitis is a chronic inflammation of the peritoneum. It may be simple, tuberculous, or malignant, producing changes in the thickness of the peritoneum, shortening of the mesentery and omentum, diminishing the caliber of the bowel and producing many adhesions. It may be local or general.

**Chronic Local Peritonitis** most commonly affects the capsule of the liver or spleen (perihepatitis or perisplenitis) where it may sometimes be recognized by a rubbing sound upon auscultation. It less commonly affects the intestinal peritoneum, appendix, and the pelvic organs. In either case, it causes adhesions which, in connection with the intestine, may form bands which lead to obstruction or give rise to more or less constant and severe colicky pain.

**Chronic Diffuse Peritonitis** is associated with cirrhosis of the liver, chronic Bright's disease, chronic alcoholism, and syphilis. It sometimes follows an acute attack, and may form a part of a general serositis in which the pleuræ and the pericardium also suffer.

**Pathology.** The peritoneum is greatly thickened; the mesentery and omentum are shortened; the caliber of the bowel is diminished; there are numerous adhesions; and effusion may be moderate in amount, the fluid being divided by adhesions into separate compartments; or it may be extensive, the fluid being free in the abdominal cavity.

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**Diagnosis.** The symptoms are often obscure and indefinite. There may be vague abdominal discomfort, burning sensations, colicky pains, and either constipation or diarrhea. There may be a slight, irregular fever. Loss of flesh and strength are noticeable and there is more or less ascites or one or more collections of fluid. There may be some abdominal distention. The omentum may be rolled and puckered into a transverse cylindrical mass between the stomach and the colon.

**Treatment.** Removal of the cause, if possible, is the first consideration. Then, attention to the general health, strengthening the resistance by stimulation of the liver, and correction of the sublaxations found in each patient. The nutritional areas need special attention.

If there is much fluid, which persists, then repeated tapings are called for.

Very slow and gentle abdominal manipulations are helpful. Any structural conditions which interfere with the circulation should be corrected. Carefully graded exercises, especially those which include "hand and foot" walking, give excellent results. These factors are to be avoided during an acute attack or an exacerbation of a chronic process.

## CANCER OF THE PERITONEUM

(Malignant peritonitis)

Cancer of the peritoneum is nearly always secondary to cancer of the stomach, liver, or pelvic organs.

The peritoneal surface is studded with cancerous nodules which tend to cause it to pucker; the intestine may be narrowed.

**Diagnosis.** The most frequent symptom is chronic ascites with progressive emaciation. On palpation the tender nodules may be felt through the wasted abdominal walls. Secondary nodules and indurated masses are common about the umbilicus. There may be enlarged inguinal glands. The aspirated fluid is usually hemorrhagic and contains the cell groups of Foulis. Carcinoma occurs usually after middle life, with marked cachexia and induration around the umbilicus.

**Treatment.** Only palliative treatment is possible. These cases are inoperable in practically every instance in which diagnosis is possible.

Opiates may become necessary before death; their use should not be begun too early, nor should suffering be permitted when the hopelessness of the condition is recognized.