

CHAPTER XVIII.

THE ABDOMEN IN GENERAL, THE BELLY WALLS, PERITONEUM, OMENTUM, AND MESENTERY.

EXAMINATION OF THE ABDOMEN IN GENERAL.

OUR methods are crude and inexact compared to those applicable to the chest. Auscultation is of practically no use. Inspection is helpful in but few cases. Palpation, our mainstay, is often rendered almost impossible by thickness, muscular spasm, or ticklishness of the abdominal walls. Percussion is of great value in some cases, but yields no useful results in the majority.

Technique.—The knack of abdominal examination, and especially that part of it whereby the skilled diagnostician gets his most valued information, is difficult even to demonstrate and almost impossible to describe. Hence the account of it in this and other books is very brief when compared with the space allotted to the methods of examining the chest.¹

The table or bed on which the patient lies during most abdominal examinations (excluding gynæcological work) should be at least three feet *high*, narrow, and *firm*. Most beds are too low, too wide, and too soft; but, on the other hand, the patient must not be made uncomfortable by the hardness or coldness of the surface on which he lies. A comfortable pillow should be provided.

¹I have heard a physician in a leading American city say that when palpation of the spleen in typhoid fever was first introduced, there was but one physician in the city who had the knack, and that his colleagues were very sceptical about the possibility of accomplishing the feat at all. I have seen a similar uncertainty regarding the palpation of the normal but slightly displaced right kidney.

INSPECTION.—We need a tangential light, such as accentuates by shadows every unevenness of the surface. If the patient is examined in the ordinary dorsal decubitus, the light from any single window, except one overhead, is satisfactory. If one inspects the abdomen with the patient upright, he should stand with his side to the light, not facing it. By inspection we seek information on:

(a) The general contour of the abdomen.

(b) The surface of the belly walls, especially the skin and the navel.

(c) Respiratory movements, their limitation or absence.

(d) Peristaltic movements (gastric or intestinal in origin).

(e) The presence of local prominence or (rarely) depression.

Inspection of the Belly Wall.—1. The *surface of the belly wall* is often searched most carefully for the *rose spots* of typhoid fever, which are hyperæmic, very slightly elevated spots, about the diameter of a large pin head (2–4 mm.). They disappear on pressure. Pimples are usually larger, better defined at the edges, and more highly colored, contrasting with the very *pale red* of most rose spots. They are by no means confined to the belly and may be found exclusively on the back. Having been at the outset somewhat sceptical of their value in diagnosis, I have become thoroughly convinced by greater experience and more careful examination. The spots are present in about three-fourths of all cases, and, while they also occur in any disease when the blood contains bacteria (*e.g.*, sepsis), they are commonest in typhoid.

2. Distended and tortuous veins on the abdomen are seen in diseases obstructing the portal circulation (especially cirrhotic liver) or the inferior cava (see Fig. 60).

3. Striæ, or linear markings on the skin of the abdomen, follow any long-standing trouble that stretches the skin—pregnancy, obesity, tumors, etc. They are red when first produced, but later turn white (*lineæ albicantes*).

4. Scars of old wounds or operations may be of great diagnostic value in comatose or delirious cases.

5. Projection or levelling of the normal depression at the navel is evidence of distention within the belly.

Respiratory movements of the belly walls are limited or cease in painful diseases within the peritoneum (peritonitis, lead colic) or when the diaphragm is pushed up by a large tumor, ascites, or meteorism.

Peristaltic waves creeping along beneath the belly walls are seen with chronic stenosis and obstruction at the pylorus or at some point in the colon and occasionally in *thin* but healthy persons.

Local and general prominence will be discussed in connection with abdominal tumors (page 368).

PALPATION.¹—With the patient on the back upon a suitable bed or table,² the head on a comfortable pillow, and the abdomen exposed, run the palm of the hand (warm) lightly over the whole surface, to accustom the muscles to its presence. Then try whether better relaxation of the belly walls is obtained when the patient's knees are drawn up. Some patients relax better in this position; others when the legs are extended.

If the muscles of the abdomen remain contracted and stiff even when the patient is comfortable and has become accustomed to the presence of the physician's hand, we may try to induce relaxation:

(a) By getting the patient to take a series of deep breaths.

(b) By diverting his attention through conversation or otherwise.

If these means fail and it is important that we should thoroughly investigate the abdomen, we have left two further ways of producing relaxation, viz.:

(c) By putting the patient into a warm bath.

(d) By anæsthesia (ether or chloroform).

The movements of the physician's hand should never be sudden or rough. He should avoid digging into the skin with his nails or pressing strongly on a small spot with the finger-tips. If any spot

¹ Special methods of palpating a diseased kidney, spleen, or liver are described in the sections on those organs.

² It is essential that the physician as well as the patient should be comfortable during an abdominal examination, else his attention is not wholly on his work. Hence the importance of a high, narrow bed, or table, so that the physician need not stretch or stoop to reach the patient.

be suspected to be tender, that should be palpated last, after going over the rest of the abdomen. If it is necessary to make deep pressure at any point, it is best to lay the fingers of the left hand loosely over the spot and then exert pressure upon them with the fingers of the right hand. The passive hand is more sensitive. To reach a deep spot, put the hands in this position over it, ask the patient to take a long breath, and, as the belly falls in expiration, follow it down with the hands. Then hold what you have gained, and with the next full expiration you may be able to get in still deeper, until after a series of deep breaths the desired spot is reached. Naturally this cannot be done if there is much tenderness, but pure nervous spasm may sometimes be overcome in this way.

To make use of the relaxation secured by a hot bath, we need an unusually long tub, so that the patient can lie almost flat when his knees are *slightly* drawn up. If he is doubled up with his knees and head in close proximity, nothing can be accomplished. The patient gets into the tub with the water comfortably warm, and its temperature is then raised to between 110° and 120° F. by pouring in very hot water. The greatest relaxation is usually attained after about ten minutes' immersion.

This method is far less inconvenient than etherization and is especially valuable when the recti are well developed and form rounded, tumor-like masses as soon as ordinary palpation is attempted. If we suspect that a tumor-like mass may be one of the bellies of the rectus, it is well to grasp the mass with the hand and then ask the patient to raise his head. The mass will harden suddenly if it is the rectus.

What can be Felt Beneath the Normal Abdominal Walls.

No part of the normal intestine, including the appendix, can, in my opinion, be felt through the abdominal walls. The same is true of the stomach, spleen, left kidney, pancreas,¹ bladder, and

¹ Leube believes that in very thin subjects the head of the pancreas may occasionally be felt.

pelvic organs. The only normal abdominal organs that we can often feel are:

1. The abdominal aorta.
2. The spinal column, near and above the umbilicus.
3. Part of the liver (occasionally, if the costal angle is sharp and the belly walls are thin and lax).
4. The tip of the right kidney (in many young persons).
5. Gurgling and splashing in the stomach or colon.

The aorta is too deep to be felt at all in some persons, but, on the other hand, it is astonishing how close under the belly wall it is in others, *i.e.*, in those whose dorsal spine projects sharply forward. In such persons the aorta may be almost taken in the hand, and its course, calibre, and motions are so startlingly evident that it is often mistakenly supposed to be the seat of an aneurism (see above, page 280), especially as a systolic murmur and thrill can be appreciated over it if a little pressure is exerted, so as to produce an artificial stenosis.

Behind and beside the aorta we can sometimes feel the bodies of the vertebræ, and on them trace the division of the aorta into the common iliaes.

The liver cannot be felt at all in the great majority of normal persons, but occasionally the costal angle is so sharp that a small portion of the organ is palpable in the epigastric region.

Bimanually (see below, page 415) the tip of the normal right kidney may often be caught between the hands at the end of a long inspiration, especially in young, thin people with lax belly walls.

If the stomach or colon contains fluids, the palpating hand often elicits sounds corresponding to the movement of these fluids. Their only importance in diagnosis will be mentioned on page 376.

The ilio-psoas muscle can occasionally be felt deep in the iliac region.

Very deceptive often are muscular bundles in the external oblique, which seem distinguishable as sausage-shaped tumors, and doubtless give rise to some of the legends about feeling the normal appendix.

Palpable Lesion of the Belly Walls.

The occurrence of lesions, to be recognized mainly by inspection and percussion, has been discussed (page 363). Besides these we search for:

1. *Hernia, epigastric or umbilical* (see Fig. 179). The diagnosis rests on the presence of an impulse on coughing, with or without a reducible tumor.

2. *Separation of the Recti*.—When the patient, lying on the back, lifts his head and shoulders, a longitudinal wedge bulges out

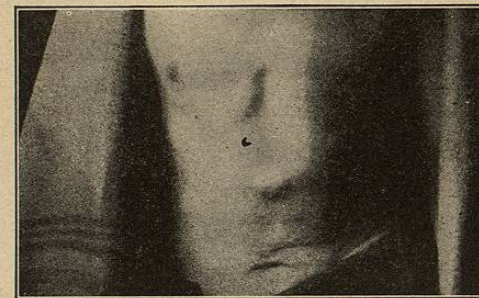


FIG. 179.—Epigastric Hernia.

along the median line of the belly from the gastric to the suprapubic region.

3. *Abscess of the abdominal walls* usually represents a stitch abscess or the external vent of pus burrowing from the appendix, the pelvis, or the prevesical space. But in about one-third of the cases no such cause can be found. An infected hæmatoma due to trauma or without known cause explains some cases, and occasionally tuberculosis or actinomycosis occurs. The latter conditions are recognized by the microscopic examination of the pus and of the abscess wall.

4. *Sarcoma* of the belly wall is rather rare, and can be recognized with certainty only by microscopic examination; without this I have known it to be confused with *lipoma* and with *tuberculosis*.

5. *Thickening or inflammation at the navel* occurs in some cases of cancerous or tuberculous peritonitis. The diagnosis rests on the further evidence of cancer or tuberculosis within the peritoneal cavity and on the microscopic examination of a piece excised for the purpose.

Palpation of the Spleen (see page 411).

Palpation of the Liver (see page 386).

Palpation of the Kidney (see page 415).

Palpation of Abdominal Tumors.

One should notice: *Size, contour, consistency, mobility with pressure and with respiration, tenderness, pulsation, peritoneal crepitus, adherence to the skin or to the abdominal wall, relationship to any abdominal organ* (also dulness or resonance on percussion, see below, page 370).

Most of these points need no comment. *To ascertain whether the tumor involves the skin*, one lifts up a fold of skin crossing the mass. If the skin dimples markedly over the tumor, *i.e.*, fails to rise at that point while on all sides of the mass it can easily be picked up, the skin is adherent. Tumors in the abdominal wall can usually be gathered up along with the latter when we grasp a large fold with both hands.

To determine the relationship of a tumor with the liver or spleen we note:

(a) Whether a groove or interval can be made out, by palpation or percussion, between the mass and either of those organs.

(b) Whether its respiratory mobility is as great as theirs.

(c) Whether there are other facts in the case suggestive of hepatic or splenic disease (jaundice, ascites, leukæmic blood).

(d) The effect of inflation of the colon (see below). Tumors connected with the spleen are forced forward and do not become resonant when the colon is inflated.

To determine the degree of respiratory mobility, hold the fingers of one hand in contact with the lower edge of the mass and allow them to descend with it while the patient takes a full breath. To

make sure that an actual descent occurs, one must *sight the mass* (and the hand) against some motionless object in the room beyond, else one may be deceived by the movement of the abdominal walls over the tumor, while the tumor itself remains motionless or nearly so. Tumors connected with the liver or spleen move about two inches with a forced inspiration. Kidney tumors move less, seldom as much as an inch. Pancreatic and retroperitoneal tumors have scarcely any mobility. Those connected with the intestine vary considerably in respiratory mobility, according to the presence and degree of adherence to other parts, but their excursion is rarely an inch.

Peritoneal crepitus is a grating, rubbing sensation experienced on light palpation, and due—supposedly—to the presence of a plastic, peritoneal exudate similar to that which produces the friction sounds in pericarditis. Over an enlarged spleen (*e.g.*, in leukæmia) peritoneal crepitus may be due to local perisplenitis, and in perigastritis, perihepatitis, and perienteritis similar crepitus occurs.

Dipping refers to a sudden displacement of the abdominal wall and whatever lies close beneath it, by a swift poke of the finger tips, which may succeed thereby in touching a solid organ or tumor which gentle, gradual palpation misses. Thus one may reach and mark out an enlarged liver through a layer of ascites which would prevent ordinary palpation.

PERCUSSION.—Abdominal percussion is much easier than thoracic. A lighter blow is used, and the distinction between dulness and tympany is easy. It is of value chiefly to determine the presence of fluid free in the peritoneal cavity, and to ascertain whether a tumor is due to or covered by gaseous distention.

(a) *Free fluid* (ascites, peritonitis, hæmoperitoneum, ruptured cyst) gravitates to the flanks and suprapubic region, while the intestines float up and occupy the epigastric and umbilical space. Hence there is dulness in the flanks and over the pubes, with resonance in the epigastric and umbilical regions. But the crucial and ever-necessary test is the shifting of this area of dulness when the patient turns on his side; then the uppermost flank should become

resonant and the lower half of the belly—including part of the umbilical region—dull. Without this test the mere marking out of dull areas in the flanks is not conclusive evidence of free fluid there. Still less reliable is the “fluctuation wave,” which can be transmitted as an impulse palpable to the hand laid flat on one flank, by sharply snapping the other flank. Similar impulses can be transmitted through the fat of the belly wall, despite all efforts to check them by pressure upon the latter.

(b) Percussion is our final test in the diagnostic procedure that begins with *inflation of the colon*. Air is forced into the rectum with an ordinary Davidson syringe, and, as the colon becomes prominent and hyperresonant, we note whether its tympany covers up the tumor-mass under investigation or whether the mass lies anterior to and remains dull over the inflated colon. Kidney tumors lie behind the inflated colon; splenic tumors remain dull in front of it.

Auscultatory percussion, for identification or demarkation of abdominal tumors and organs, has never been successful in my hands nor in those of most of the observers in whose results I have confidence. Hence I omit further description of it.

Percussion of the stomach and spleen (see below, pages 378 and 410).

Percussion of Traube's semilunar tympanic space (the small area bounded on the right by the splenic and on the left by the hepatic dullness, above by the free edge of the left lung, and below by the lower edge of the ribs) is, in my experience, of very little value in diagnosis. This tympanic area is obliterated in many pleuritic effusions (not in all), but many other causes (full stomach or gut, obese omentum) may produce similar dullness.

DISEASES OF THE PERITONEUM.

1. Peritonitis—local or general.
2. Ascites.
3. Cancer and tuberculosis.

I. Peritonitis.

1. *Local peritonitis* gives evidence of its presence by (a) pain, (b) tenderness, (c) muscular spasm, (d) tumor, and (e) constitutional manifestations.

The *pain* may be at first diffuse, later localizing itself at the site of the lesion; or it may be felt first where the peritonitis begins and spread with the lesion if the general peritoneal cavity become involved. The character and intensity of the pain vary greatly.

Tenderness is the important sign in diagnosis, and helps us to exclude the various colics and other causes of pain which are often relieved by pressure.

Local muscular spasm of the belly muscles to guard the tender lesion beneath is of great value in pointing our attention to the spot affected, though the muscles may be so rigid as to prevent palpation through them. [*Psoas spasm* is described in the section on appendicitis, see page 400.]

The *tumor* is apt to consist of intestine or other organs matted together by adhesions about the site of the process.

The *constitutional manifestations* are those of *infection*, viz., fever, leucocytosis, anorexia, constipation, often albuminuria and albumosuria.

The commonest causes of local peritonitis are:

1. Appendicitis.
2. Pus tube.
3. Gall-bladder inflammation.

Less common is cancer or ulcer of the stomach or intestine.

2. *General Peritonitis*.—The belly may be generally *swollen* and tympanic or *retracted* and hard. *General tenderness* is the most important sign. In advanced cases *free fluid in the flanks* may be demonstrated, as explained on page 369. Fæces and even gas cease to move, as the intestines are paralyzed. Vomiting is the rule, and soon becomes very foul (stercoraceous). There is fever, with a rapid and very weak pulse. The mind is clear, alert. The facial expression is not peculiar and may be normal. If there is persis-

tent vomiting the facies of that condition appears, viz., a drawn, pinched, anxious look, with dark circles under the eyes. The nausea and the rapid loss of fluid by vomiting account for these appearances.

The leucocyte count is generally elevated, but in the most virulent cases remains normal or sub-normal.



FIG. 180.—Characteristic Shape of Belly in Ascites.

II. Ascites.

The causes are:

- (1) Portal stasis, usually from cirrhosis of the liver.
- (2) Dropsy, from cardiac or renal disease.
- (3) Tuberculous peritonitis.
- (4) Anæmia.
- (5) Cancer of the peritoneum.
- (6) Various unknown lesions.

The methods of diagnosis of ascites have been explained above. The diagnosis of its cause depends on the history and the general physical examination.

The contour of the belly is often that pictured in Fig. 180.

III. Cancer and Tuberculosis of the Peritoneum.

In connection with cancer or tuberculosis of some abdominal or pelvic organ, the disease may become spread throughout the peritoneum with deposits in the omentum and mesentery. The signs are: 1. Tumor masses scattered here and there, sometimes at the navel. 2. Ascites. 3. Emaciation and anæmia.

The diagnosis of cancer depends on the recognition of multiple, hard, nodular tumors in the abdomen of a patient known to have cancer of some abdominal organ.

Somewhat similar masses, usually due to loops of intestine

matted together by adhesions, may be felt in *tuberculous peritonitis*, but here they are larger, fewer, and not so hard. Cancer appears in late life, tuberculous peritonitis usually in early life. The emaciation and anæmia are less marked in tuberculosis, and fever is more marked. The history or present evidence of tuberculosis elsewhere—lung, pleura, glands, pelvis, testis—favors the diagnosis of tuberculous peritonitis. If fever is not marked the tuberculin test may be of value in diagnosis.

THE MESENTERY.

1. *Enlarged glands*—tuberculous, cancerous, or as part of Hodgkin's disease—can occasionally be felt in very thin patients. Their recognition as glands would depend on more obvious evidence of their cause in other parts of the body.

2. *Mesenteric thrombosis* produces all the signs of intestinal obstruction (see below, page 401), from which it can rarely if ever be distinguished without operation or autopsy.