

peculiar to any one disease of the organs, but is ordinarily to be regarded merely as one of the concomitant signs of the general emaciation which attends the various consumptive disorders. It is also observed when the bowel is almost or entirely empty, as from stricture of the œsophagus, cancer of the pylorus, stenosis of the upper part of the intestinal canal. Emaciation from these causes is commonly accompanied, particularly in children, by other phenomena which are equally characteristic of a lowered state of nutrition of the skin, such as loss of elasticity and free desquamation (pityriasis).

In the basilar meningitis of children a boat-shaped depression of the surface of the abdomen is generally seen, caused by the contraction of the muscular coat of the intestines, from irritation of the nervous centres which govern the movements of the bowel.

Not unfrequently the examiner may obtain important information by noticing the movements which are communicated to the contents of the abdomen by the act of respiration and the action of the heart. Thus, large tumours of the liver and spleen sink into the abdominal cavity in inspiration and rise in expiration; in the case of the liver, indeed, the whole of its sharp lower border may be distinctly discernible during respiration. The movement given to the diaphragm by the action of the heart is frequently manifest to the eye when there is a large free effusion in the peritoneal sac, the impulse passing onward through the fluid, and making itself visible as a superficial wave which appears and disappears with great rapidity.

## PALPATION OF THE ABDOMEN.

THIS is a method of examination of the first importance in the investigation of abdominal diseases. It enables us to determine the size, form, consistence, and situation of the various organs, and discloses the existence of tenderness to superficial or deep pressure, the presence of any abnormal body or substance in the abdominal cavity, &c. The information so gained, it is true, is only of a general character, it reveals simply the *physical condition* of the parts and not the exact nature of the diseases by which they may be affected; but it constitutes the groundwork on which the further diagnosis rests, a more complete or particular understanding of the case in hand being possible only on taking into consideration the other symptoms presented by the patient.

In another class of cases, especially of abdominal tumour, diagnosis is rendered exceedingly difficult or becomes at best a matter of some uncertainty, when the organ from which the tumour springs undergoes alteration in form or anatomical situation, or when the starting point of the growth can no longer be positively made out. In many other diseases also, which give rise merely to physiological, functional disturbance, but to no deformity, displacement, or change in the dimensions of the organs, palpation yields no indication of any value from a diagnostic point of view.

Palpation is most conveniently practised when the patient is laid on his back or, occasionally, on one or other side; if the tension of the abdominal walls prove a serious obstacle to its proper performance the thighs should be flexed on the body, though even this expedient is not always successful in accomplishing the object intended. The great difficulty to be overcome, apart from that presented by the varying thickness of the subcutaneous layer of fat, is the tension of the abdominal muscles, particularly of the recti. The examiner should be

familiar with the general anatomical relations of these muscles, the manner and direction in which their fibres are disposed, and the resistance they offer when grasped between the fingers, to guard him from error when dealing with disease.—Palpation is easiest in emaciated individuals and in women who have borne several children.

When the abdominal organs are in their normal condition the hand meets with no unusual resistance when applied to the surface; all parts of the abdomen give a uniform feeling of softness, except those corresponding to the recti muscles, and the epigastrium (from the presence of the left lobe of the liver), where a slightly greater degree of resistance is encountered. By pressing deeply in the middle line the pulse of the abdominal aorta is felt, and frequently also the vessel itself and close to it the vertebral column; even the coils of the intestine may be distinguished when the abdominal coverings are sufficiently lax.

#### PALPATION OF THE LIVER.

In men the presence of the liver under the margins of the ribs, when the organ is of its natural size, is indicated merely by an increase in the resistance to pressure in deep inspiration; it is only when the abdominal parietes are unusually thin and flaccid that its edge is detected with the hand. In women, especially such as have been several times pregnant, the softness and looseness of the superficial tissues facilitate the exploration of the parts beneath the arch of the ribs and permit the more ready appreciation of the inspiratory descent of the border of the liver.

The extent to which an *enlarged* liver is accessible to palpation depends on the distance to which it projects beyond the margin of the ribs into the abdominal cavity, occasionally only its sharp edge, at other times a considerable portion of its surface, coming within reach of the finger. In extreme cases of enlargement the liver may fill up a large part, sometimes even the whole of the abdomen. The greatest amount of swelling of the organ is observed in carcinomatous degeneration, the increase in size being usually slightly less in amyloid degeneration and hydatid cystic disease; the less marked degrees of enlargement occur in cases of retention of bile, passive congestion (as that due to

mitral lesion), fatty infiltration and parenchymatous hepatitis.—The palpation of an enlarged liver, both of its borders and surface, presents little difficulty, as the whole extent to which the organ is increased in volume is readily detected, provided there be no unusual tension of the abdomen, such as often results from ascites.—Palpation further determines the presence or absence of sensibility or pain in the liver, the consistence of the organ, and the condition of its surface and edges.

Pressure on the surface of the liver may be painful or painless. A certain amount of *pain* to pressure is frequently associated with the swelling arising from retention of bile (in duodenal catarrh, &c.) and with all inflammatory conditions, though it is most characteristic and most severe in malignant disease. According as the cancerous nodules are scattered on the surface of the liver or are situated more deeply in its texture, the pain is elicited by applying the hand lightly or with firmness and force; it occurs spontaneously also, and is almost constant throughout the whole course of the disease.—Spontaneous paroxysmal pain of extreme severity is felt in the upper abdominal region in cholelithiasis.

Hepatic pain originating spontaneously and aggravated by pressure, is always a valuable indication of liver-disease in general, and is of service also in distinguishing between painful and painless affections. Fatty liver, amyloid liver, and hepatic hydatid growths are *painless* to palpation.

The *surface* of the enlarged liver may be perfectly smooth or rough and nodulated, the irregularities by which it is marked consisting either of slight elevations alternated with shallow depressions, or of tumours varying in size from the bulk of a pea to that of the closed fist.—The surface of the liver is smooth in all acute and chronic enlargements connected with hyperæmia, biliary engorgement, and fatty and amyloid degeneration; it is irregular when the organ contracts in the later stages of cirrhosis (granular atrophy) and in interstitial gummous hepatitis; nodulation,—the presence of small rounded elevations or tumours,—is characteristic of carcinoma, and occasionally also of hydatid disease.

If the hepatic cancer be of the diffuse variety, cancerous infiltration, the surface of the liver is free of such nodular excrescences.

In cases of hydatid disease there are often felt on the surface of the

liver several smooth projections of moderate size, which offer only slight resistance to the finger; but till the stage of the disease arrives at which the surface of the organ is distinctly bulged outwards by the vesicles the diagnosis amounts merely to a probability, and depends on the careful exclusion of all other causes of hepatic enlargement.

The enlarged liver is of a variable degree of *consistence*.

In acute swellings, such as arise from inflammation or retention of bile, the organ is slightly softer to the touch than the chronic enlargements and degenerations. Among the chronic degenerations (leaving out of consideration the cirrhotic liver, which is the hardest of all, but which need not be noticed here, as it contracts to less than its normal size and is therefore not reachable by palpation) the amyloid liver is the most dense, the fatty liver being somewhat less firm. When the distinction between these two conditions is not otherwise clear the consistence as revealed by palpation may be taken as a diagnostic criterion.

Uniform enlargement of the liver causes no alteration in the general *form* of the organ; but when the tumefaction is confined chiefly to the right lobe, or more rarely to the left, the most diverse changes in shape are met with. These affect the whole mass of the liver as well as its border, though the latter *alone* may be the seat of the greatest change, the rest of the organ not being involved, as, for instance, in cases in which echinococcus-vesicles develop in the margin of the liver. These hydatid growths and cancer (sometimes also syphilis) produce, on the whole, the greatest degree of deformity of the liver, the other hepatic diseases being generally attended by uniform enlargement of the organ in all its diameters.—Whilst the breadth of the hypertrophied liver is usually easily and accurately determinable by palpation, and its breadth by percussion, only an approximate estimate of its thickness can be formed if that estimate be based simply on the amount of abdominal enlargement present; the thickness of its lower part is more easily ascertained, particularly when a portion of its concave under surface can be felt through the flaccid abdominal walls.

A peculiar sensation, known as "hepatic fremitus" was described by Briançon, and some time after him by Piorry, as characteristic of the presence of echinococci in the liver. They state that when a short sharp stroke is delivered with the finger on the echinococcus-tumour, which must have extended quite to the surface of the liver, a tremulous

sensation is felt in the finger-tips of the other hand placed on the skin close to the part percussed. That under favouring conditions, *i.e.*, over a hydatid tumour of large size, forming a marked prominence on the anterior surface of the liver, such a phenomenon may be observed is undoubtedly true, but it is also certain that in the vast majority of cases it is absent. Many of the assertions made by authors regarding the occurrence of this sign must be set down to self-deception; its comparative rarity is evident from Finsen's statement that he had not once detected it in 235 cases of echinococcus-liver that had come under his notice.\* It is moreover the case that this sensation, which bears a very close resemblance to fluctuation, is not peculiar to hydatid cysts; it is felt over ovarian cysts and in cases of ascites, and even in parts containing no trace of fluid,—as when there is a large deposit of fat under the soft lax skin of the abdomen.

There remains to be noticed the sense of fluctuation, yielded by *large hepatic abscesses* which reach the anterior surface of the liver,—affections which, in our northern climate, are exceedingly rare.

The mere fact that the liver can be felt projecting from under the ribs, is not always to be taken as an indication that it is enlarged; in women who lace tightly it may be pressed downwards till its edge protrudes  $2\frac{1}{2}$ —5 ctm. beyond the margin of the ribs, or in aggravated cases descends almost as far as the umbilicus. Downward displacement of the liver also occurs when the diaphragm is depressed by pulmonary emphysema, right pleural effusion or pneumothorax. In certain rather rare cases it sinks in the cavity of the abdomen from relaxation of its suspensory ligament; when this relaxation, which may be caused by some intrinsic affection of the ligaments themselves, becomes excessive, and when to this is added other elements (such as severe labour) which tend to aggravate the original defect, the liver may hang downwards even as far as the anterior superior iliac spine. This

\* I have had under observation thirteen cases of hydatid disease of the liver; amongst those were three in which the tumours had made their way to the surface of the organ, and one in which an enormous *mass of echinococcus-vesicles was discharged through the umbilicus*, but in none of them could I discover any trace of the peculiar phenomenon under discussion.

That a simple hypertrophy of the liver, when combined with a certain amount of softening of the hepatic substance, may closely simulate hydatid disease, was strikingly demonstrated in a case which I had an opportunity of seeing. The patient apparently presented the most marked signs of hydatid affection of the liver. The diagnosis seemed so clear that some time afterwards the proposal was made to puncture the cyst and evacuate its contents, but as the patient was unwilling to submit to the operation nothing was done. At the examination of his body after death absolutely no echinococci were found in the liver. The swelling was due principally to an enormous hyperplasia of the interstitial connective tissue. The cause of the deceptive sense of fluctuation which was so marked during life could not be discovered.

is described as *movable* or *wandering* liver; only nine cases of this kind have hitherto been recorded.

The differentiation of enlarged from displaced liver is effected by determining the upper border of the organ by means of percussion. If this be normal, and if the liver also extend downwards to some distance beyond the ribs, enlargement is clearly indicated.—It is not to be forgotten also that the liver may, in certain circumstances, be found to be both displaced and enlarged.

Occasionally the *gall-bladder*, fully distended with bile, presents itself as a pyriform, moderately elastic tumour, projecting slightly beyond the edge of the liver, usually distinctly visible on the surface, but still more easily recognised by palpation, offering little resistance to the touch, and at times giving to the finger an unmistakeable sensation of fluctuation. This tumour may be temporarily diminished in size by pressing upon it and causing a quantity of the bile which it contains to flow out through the excretory ducts; I observed this in a severe case of jaundice, in which the dilated gall-bladder had produced a considerable, pear-shaped elevation of the abdominal wall. The situation of a biliary tumour of this kind at the part corresponding anatomically to the position of the gall-bladder, and the severe accompanying icterus, render its recognition easy.—The gall-bladder is, in certain exceptional cases, enormously distended with serous fluid (dropsy of the gall-bladder), when it loses all trace of its original shape and may occupy a large part of the abdominal cavity.

#### PALPATION OF THE SPLEEN.

The spleen, so long as it retains its normal dimensions, cannot be touched with the palpating finger; it is only in full inspiration and when the abdominal coverings are unusually soft and yielding, that its anterior lower end may be felt deep in the left hypochondrium. Palpation of the spleen is best accomplished during the respiratory pause, the finger-tips being thrust in under the left costal margin as the patient draws a long deep breath. When palpation is found to be difficult or impossible in the dorsal recumbent posture the abdominal wall may be still further relaxed, and the examination thus rendered easier, by turning the patient over on his right side.

Even a slight degree of enlargement of the spleen is, at the end

of a long and full inspiration, appreciable to deep palpation, though this is not always indicated by an actual advance of its lower end but sometimes only by a well-marked increase of the sense of resistance. As the organ grows larger it takes up more and more of the abdominal cavity, extending obliquely downwards and inwards, toward the median line. In accordance with the laws of gravitation the direction in which the increase in volume of the spleen takes place is almost invariably downwards, upward displacement of the diaphragm from this cause being observed only when the tumour is of exceptional magnitude.

The slighter forms of splenic enlargement are met with in the various infectious diseases, typhoid fever, typhus, pyæmia, relapsing fever, small-pox, recent syphilis, &c., and in cases of obstruction of the circulation in the portal system, caused most usually by cirrhosis of the liver and various cardiac lesions; even in these affections the spleen, though it occasionally swells to twice its natural size and often to a greater extent, very seldom emerges from under the costal arch, but is perceptible to the hand only in deep inspiration. Intermittent fever of long standing, and amyloid degeneration, give rise to still greater enlargement; it is in leukæmia, however, that the most notable amount of hypertrophy is observed. In the last-mentioned affection it is not uncommon to find a splenic tumour of such dimensions that it fills half or even more of the abdominal cavity.

Except in those cases of enormous enlargement just referred to the spleen, when hypertrophied, generally preserves its original form, the increase which it undergoes being nearly equal in all its diameters—its length, breadth, and thickness. Splenic tumours of irregular outline, bearing no resemblance to the normal shape of the spleen, are exceedingly rare. The anatomical situation of the enlarged spleen also corresponds generally with that of the organ in health; its long diameter runs parallel to the curve of the ribs, taking a more diagonal direction than the transverse diameter. The thickness of the tumour may also be approximately estimated when its concave surface can be reached with the finger.

The *notches* or *depressions* on the surface of a very much enlarged spleen may usually be distinctly felt; the swelling of the organ as a whole deepens them to such an extent that they

can be made out with the greatest precision. Generally there is only one large fissure on the spleen, and one, sometimes two, rather smaller. In cases in which there is some difficulty in recognising whether the tumour is really spleen or not, these indentations become of prime importance as diagnostic signs, as they are discovered in no other variety of swelling than that consisting of the hypertrophied spleen.

All splenic tumours of any considerable magnitude, reaching downwards some distance in the abdominal cavity, are of firm *consistence*; the leukæmic, amyloid, and malarial forms are all more or less alike in this respect, or at least differ so slightly that their density offers little that is of value in a diagnostic sense. Those associated with acute diseases, on the contrary, never attain any very great size and are always of very soft consistence; in typhus indeed they are even softer than the healthy spleen.

The *surface* of all these tumours is smooth, or at most presents no marked irregularity.

Palpation of tumours of the spleen gives rise to almost no pain, or, in exceptional instances, to only a slight feeling of uneasiness.

Finally, the spleen may form in the abdomen a distinctly visible and palpable swelling without at the same time necessarily being the seat of any enlargement; it may be *dislocated* as the result of relaxation of its retaining ligaments, when it is caused to shift about from one part to another of the abdominal cavity with every change in the posture of the body, constituting what is known as *movable* or *wandering spleen*. As it commonly sinks so far that its upper end comes to be situated just under the border of the costal arch, and as, further, it lies so close to the surface that its general configuration is readily and accurately made out with the hand, the diagnosis in such a case is easy.\*

\* I have seen three cases of movable spleen. In the first case, that of a man in his thirtieth year, the spleen was replaced and kept in position by means of a bandage, when the pain, which had been till that time treated in various ways without success, and which was evidently caused by disturbance of the neighbouring organs by the spleen, immediately disappeared.—In the second case, which occurred in the person of a woman 48 years of age, the dislocated spleen lay in the left iliac region, just under the soft loose abdominal coverings; its whole outline, even its notch, could be distinguished with perfect precision by palpation, and the organ could be moved about in the abdomen to a very considerable extent. The dislocation had occurred suddenly, as the result of some violent physical effort, the patient at the same time

The diagnosis of splenic tumour in general rests, as we have seen, on the indications, furnished by palpation, relative to the situation and shape of the swelling, the presence on it of one or more indentations, and on the fact that the tumour, lying under the left lower ribs, presents an area of percussion-dulness which is continuous superiorly with that of the spleen. The precise nature of the tumour is inferred from the results of further examination. It is obviously *leukæmic* if any very considerable increase in the number of the white blood-corpuscles can be shown to exist,\* or may be assumed to be *amyloid* if the patient labour under any disease in which it is known that the organs are liable to this form of degeneration (destructive changes in the lungs, diseases of the bones, syphilis—in which the liver also is usually enlarged) and if, in addition, the urine is found to be albuminous (amyloid kidneys); it may be regarded as of *malarial* origin if its appearance is preceded by chronic intermittent fever, or as due to congestion in those affections in which circulation in the portal system is impeded (cirrhosis of the liver, &c.)—

being made conscious, by her sensations, of the nature of the accident that had befallen her; the tumour occasionally gave her slight dull pain. The splenic dulness was wanting in its normal situation, the pulmonary percussion-sound merging directly into the clear tympanitic sound of the intestines.—In the third case, that of a young woman who suffered from angular and lateral curvature of the spine and who had been twice delivered of a child by instruments, the spleen lay in contact with the flaccid abdominal wall a little above the left iliac region; the displacement was supposed to have taken place after the second confinement. The tumour was movable within certain narrow limits, and its size and shape were exactly definable by palpation. The most notable fact in connection with this case was that the patient, desiring, perhaps, to become famous as a pathological marvel, caused the spleen to be totally *extirpated*; in fourteen days she had recovered from the operation. She continued in good health for three months, when she died from the effects of another operation—colporrhaphia posterior.

\* In normal blood there are about 300 red corpuscles to every white corpuscle, and in the field of the microscope, under a power of 300 diameters, it seldom happens that more than 10 of the latter are seen scattered among the closely packed and adherent red globules. In profound leukæmia the proportion of colourless corpuscles to red rises to 1 of the former to 10, 5, or even 3 of the latter, and cases have been met with in which the number of the white globules equalled or even exceeded that of the red. Even in the less intense forms of the affection the increase of the colourless corpuscles as compared with their rarity in healthy blood strikes the eye at once.

In splenic leukæmia, *i.e.*, in those cases in which only the spleen is swollen and not the lymphatic glands, the colourless corpuscles are found to be of large size and to contain several nuclei; whilst in the lymphatic form of the disease, in which only the lymphatic glands are enlarged, and not the spleen, the white corpuscles are small and granular, with solitary, relatively large nuclei. When, as is very frequently the case, both spleen and lymphatic glands are swollen, *both* kinds of colourless corpuscles are seen side by side.—The blood required for examination may be taken from any part of the body which is most convenient, by making a slight scratch on the skin.