

DISEASES OF THE SPLEEN.

TOPOGRAPHY OF THE SPLEEN.

IN the normal condition of the organ the spleen is too small and too deeply placed to be felt, or indeed to be defined, even by careful percussion. Lying under the concavity of the diaphragm, covered by the stomach and by the transverse colon, and surrounded by the ribs, it is not brought within the range of our clinical methods. It is liable to displacement, the vessels forming a pedicle of less or greater length, permitting sometimes an extensive range of motion. Under such circumstances, instead of its natural position in the left hypochondrium, the spleen may glide downward into the umbilical, even as low as the hypogastric region. When enlarging from its true position in the hypochondrium, the change consists in an expansion, obliquely downward, of the area of splenic dullness.

The size and density of the spleen may be ascertained with an approximation to accuracy, by percussing the organ when forced downward and held by a full, retained inspiration, and comparison with the same area emptied by a full expiration.

The spleen being a highly elastic body, and its dimensions varying with the amount of blood contained in the vessels, there are rapid changes in the area of splenic dullness, strictly within physiological limits. Certain remedies, as ergot and quinine, have the power to contract the organ, but it is probable that this action only takes place when the spleen has undergone a pathological enlargement.

ACUTE SPLENITIS.

Definition.—By the term acute splenitis is meant acute inflammation of the spleen. Perisplenitis is a designation applied to inflammation of the investing tunic or capsule, and of the peritoneal layer of the organ. Acute splenic tumor means an acute enlargement—a condition present in various acute infectious diseases.

Causes.—Our present knowledge of the etiology of spleen-diseases is very unsatisfactory. Hardly anything is known of idiopathic splenitis. Of the secondary, or metastatic malady, our information, if not full, at least contains some certain data. That splenitis arises from

embolism is now well known. Inflammation of neighboring parts extends to and involves the spleen. Direct injury, as a blow over the left hypochondrium, may excite inflammation in the spleen. A case arising in this way the author had under observation during life, and was present at the autopsy; hence the account given of the disease in question is derived largely from this experience.

Pathological Anatomy.—Local, or circumscribed, splenitis is induced by embolic blocking of a vessel or vessels, and hence the infarctions may be one, or two, or three in number; they may be in the substance, or at the periphery of the organ.* These infarctions vary in size from a pea to a hen's-egg, are wedge-shaped, and when near together may coalesce. These infarctions undergo the usual transformation, and a purulent collection is the ultimate result of the changes. A limiting membrane may form, and the pus become encapsulated, or the boundaries of the purulent depot may be constituted of the ragged, disintegrating, soft, splenic pulp. The pus tends to make its way externally, and when the capsule is reached adhesions form, usually to the diaphragm. In the author's case, as a result of a powerful blow on the left hypochondrium (which, however, left no external trace of the injury), the whole organ was turned into a brownish purulent collection of eighteen ounces' capacity. Adhesions had been formed with the diaphragm, which was softening, and adhesion of the opposed pleural surfaces indicated the preparation for discharge by a bronchus. The abscess may break into the peritoneal cavity, with the effect of inducing fatal peritonitis.

Symptoms.—As the systematic writers are not agreed as to the character of the symptomatology, the author describes it wholly from his own observation. After the injury, or we may also suppose the embolic obstruction, in a day or two, pain is experienced, deeply in the right hypochondrium. The sensation is rather of an aching character, which becomes soreness and tenderness when the organ is compressed—a feat that is accomplished by pressing upward under the ribs when the patient takes a full inspiration. There is usually pain developed by taking a deep breath, which becomes catching and acute when the peritoneum is invaded. Neither on palpation nor on percussion can an increase in the volume of the spleen be made out with certainty. In about a week after the initial symptoms, a rigor occurred, followed by fever and sweats, and these appeared irregularly up to the end. The face was pallid, the lips white, the sclerotic glistening, the body emaciated, and the weakness extreme. The appetite was lost, there was occasional vomiting, and diarrhœa supervened toward the termination of the case. Presently a harassing, dry cough, accompanied with pain and an obstinate hiccup, made its appear-

* Billroth; Virchow's "Archiv," Band xxiii, p. 473: "Der haemorrhagische Infarkt und seine Metamorphosen."

ance. An increase in the left side through the hypochondrium and an enlargement of the area of splenic dullness now became evident. Death occurred by exhaustion on the forty-second day from the first symptoms.

Course, Duration, and Termination.—Nothing can be more ill-defined than the course of splenitis. The duration of cases of inflammation terminating in abscess may be not more than a month, and yet cases have continued several years (Mosler). Splenitis may terminate in resolution without symptoms. This is the most probable explanation of the existence of cicatricial depressions on the surface of the spleen, found in cases dying from other causes. Cases proceeding to suppuration terminate by discharge through the lungs, of which a successful case has been reported, or communication is established with the stomach, the transverse colon, the left kidney, or with the general cavity of the abdomen.

Diagnosis.—If endocardial lesions exist, and sudden pain followed by swelling occur in the splenic region, and subsequently there arise the usual symptoms of suppuration, or if, as a result of a blow, pain and tenderness and swelling develop in the left hypochondrium, the spleen may be presumed to be the seat of the mischief.

Prognosis.—As those cases of splenitis which terminate in recovery are never recognized, the question of prognosis does not come up for solution. When abscess occurs, the prognosis is unfavorable.

Treatment.—If the existence of splenitis, from any cause, is ascertained, quinia must be freely administered, and cinchonism maintained. There are two good reasons for this practice: quinia checks the migration of the white corpuscles and the process of suppuration, and lessens hyperæmia of the spleen. No therapeutical fact is better established than that quinia reduces the size of the spleen when it is enlarged by hyperæmia. Quinia is, therefore, peculiarly adapted to the treatment of splenitis. Purgatives act on the spleen in two modes; by reflex action, and by diminishing the general blood-pressure. Saline cathartics should be used to maintain free action of the intestines. Warm fomentations, turpentine-stupes, and hot poultices should be applied over the left hypochondrium. If suppuration is clearly ascertained, the aspirator should be used without delay, just as it is now employed in a similar state of things in the liver. The strength must be kept up by suitable food and stimulants.

ENLARGEMENT OF THE SPLEEN.—Owing to its peculiar anatomical structure, the spleen is especially liable to variations in size, strictly within physiological limits. In the acute infectious maladies the organ undergoes a change in size of a pathological character. In typhus, typhoid, puerperal, and the eruptive fevers, the spleen enlarges, but in the fevers of marsh-miasm the change in size is greater.

In certain parts of this country—the Wabash Valley, for example—a splenic tumor of extraordinary size (ague-cake) sometimes develops under the influence of malaria without the objective phenomena of fever, but with the same bodily changes as occur in intermittent and remittent fevers. Obstructive diseases of the heart, lungs, or liver, by causing stasis in the venous system, give rise to enlargement of the spleen, and especially does this result follow sclerosis, and acute yellow atrophy of the liver. In the condition of enlargement which occurs during the course of fevers—excepting from consideration malarial fevers—the spleen is excessively soft, the splenic pulp almost diffuent, the capsule and trabeculæ easily torn. In the acute enlargement which accompanies the febrile movement of malarial fevers, there is really no alteration of structure—the pulp and trabeculæ and the Malpighian bodies having their normal appearance and structure, but the increase is due to an immense venous congestion. On the other hand, in the enlargement which occurs without fever, or produced after successive attacks of fever, the organ is dense, firm, and paler, due to the great development of the trabeculæ and corresponding diminution of the splenic pulp. In these cases of chronic enlargement due to malarial infection, the organ may attain considerable size, greatly distend the abdomen, and reach to and even extend beyond the umbilicus. There is in these cases an extreme anæmia—a pseudo-leukemia—the superficial veins of the abdomen are enlarged, the legs are swollen, and there is some effusion in the abdomen—results of the mechanical pressure. A splenic tumor of medium size, formed in the mode above indicated, may lodge on the aorta and be confounded with aneurism.

MISPLACEMENT OF THE SPLEEN, or MOVABLE SPLEEN.—Changes in the position of the spleen are effected by effusions in the left thoracic cavity, which displace the organ downward. When enlarged and in the condition of “fleshy spleen” above described, the spleen may descend considerably by its own weight, and thus seem more enlarged than it is really. The movable spleen, like the movable kidney, is displaced from its position, and its vessels with the omentum are stretched and ultimately assume the shape of a pedicle—an irregularly rounded cord—of which the author has seen several capital examples. Such a spleen may be moved by a change in the position of the patient, or by palpation, and may lie across the abdominal artery and be lifted up synchronously with the arterial pulsation, or be displaced downward into the iliac fossa, and may rotate on its horizontal axis. Changes in the structure of the organ necessarily occur under these circumstances; the blood-supply is lessened, or thromboses form in the vessels; there are shriveling and atrophy, pigmentary and fatty degeneration, etc.

AMYLOID DEGENERATION OF THE SPLEEN.—This disease consists in the deposits of the amyloid matter, either in the form of small patches, forming the well-known "sago-spleen," or in a general diffusion of the material through the whole organ. In the former the patches may be very numerous and almost unite, but there still remains normal spleen-tissue between them. In the latter form the texture of the spleen is firm and tough, but easily divided with the knife, although not readily broken up into a pulp, and it has a brownish or yellowish-brown color, and no part remains untouched by the new deposit—the pulp, the trabeculæ, the Malpighian bodies, the vessels, all are changed in structure and physical properties by the amyloid matter. The test for this matter is iodine—Lugol's solution—which when brushed over colors the tissues yellowish, but the amyloid matter red or reddish brown: now, on the addition of sulphuric acid, while the yellowish parts remain yellow, the amyloid becomes a dark violet. The amyloid, or lardaceous, or waxy degeneration of the spleen occurs, simultaneously with the same form of degeneration in the liver and intestinal canal, and hence the symptomatology is rather that of the disturbance in the function of the other organs. These symptoms have been detailed in the remarks on amyloid liver. The only contribution made to the symptomatology by the alterations in the spleen are, the increased area of splenic dullness and a greater degree of anæmia and pseudo-leukemia. The great cause of amyloid degeneration of the spleen as of other organs is suppuration, especially protracted suppuration in connection with bone. Next to this are the syphilitic cachexia and inherited syphilis. Chronic alcoholism and chronic malarial poisoning are supposed to have some influence in its production, but it is extremely doubtful whether they have any real influence.

ECHINOCOCCUS OF THE SPLEEN.—The embryo of the tænia echinococcus is deposited in the spleen as in other organs, and more frequently in the spleen than in any, except probably the liver. The liver is reached readily by the portal vein, and the spleen directly, as the two organs come into contact. When established in its home, growth begins, chiefly by the development of daughter-vesicles in the mother-sac. The symptoms produced are due to the size to which the sac attains, the pressure on neighboring organs, and the interference with the circulation in the great vessels of the abdomen. The slowness of the growth, the absence of constitutional disturbance, the freedom from pain, and the absence of symptoms except those due to the size of the tumor, separate the echinococcus from other tumors of the spleen. The sense of fluctuation, and especially the purring tremor, serves to distinguish this from hypertrophy of the spleen. The employment of the aspirator-needle will contribute to certainty of diagnosis,

but the presence of hooklets and the absence of albumen can not always be depended on, for the hooklets may be absent, and albumen may be present in echinococcus tumors of the spleen. For further details the reader is referred to the subject of echinococcus of the liver.

DISEASES OF THE BLOOD-FORMING ORGANS.

THE BLOOD.

It will facilitate the comprehension of the maladies treated of in this section, to precede the account of the several morbid states with some observations on the nature and composition of the blood.

Composition.—The ultimate chemical composition of the blood is as follows:*

Reaction.....	alkaline
Specific gravity, from.....	1,045 to 1,075
Water.....	781.6
Globules.....	135
Albumen.....	70
Fibrin.....	2.5
Fats.....	1.5
Extractive matters.....	2.4
Salts.....	6.5
Iron.....	.5

The results of chemists vary according to the method of analysis employed. The most considerable departure from the ordinary method is that of Flint, who tries to measure the several constituents in their natural state; that is, with their water of composition and the inorganic salts so closely associated with them as to be separated only by incineration.† There is much to be said in favor of this method. Without engaging in this discussion, the several constituents of the blood will be briefly considered, with reference to the changes induced by disease.

In general terms, the blood may be considered as made up of certain morphotic or formed constituents—the corpuscles, red and white—floating in a complex fluid, containing, dissolved in it, albumen, fibrin, fats, and salts. The red corpuscle consists of two parts: the matrix, or stroma, which seems only to serve the purpose of a vehicle for its

* Becquerel et Rodier, "Traité de Chimie Pathologique Appliquée à la Médecine Pratique," etc.

† The "Physiology of Man," vol. i, p. 133.