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Shattuck (F.C.)

FLOATING SPLEEN.

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OF BOSTON.

Read at the Annual Meeting of the Massachusetts Medical Society, June 11, 1878.



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A CASE of this condition which came under my care led me to look into the subject, and to think that my results might prove of some interest, especially to physicians of this neighborhood, the great immunity of which from malarial influences renders affections of the spleen comparatively rare.

July 26, 1877, I was called to a young man, a baker by trade. His family history was good, and he had never been laid up before by sickness, as far as he could remember. Was born in Boston, and had always lived here with the exception of two or three years—1873-'75—which he passed near the eastern end of the Hoosac tunnel, a region in which I am informed malaria is not unknown. He had never suffered from chills and fever, had never done any heavy lifting or had any fall or injury of consequence.

July 14, went to bed and to sleep as usual, but was wakened during the night by severe pain in the left hypochondriac region, and then discovered for the first time that he had a tumor in his abdomen. He described the pain as having been very sharp, as having drawn him down on the left side, and as having been aggravated by deep inspiration or by flexing the left thigh on the body. By July 19th the pain left him and he resumed work, but had a fresh access during the night of the 21st, and again during that of the 22d. A physician was then called in, who enjoined close confinement to bed.

I found him in bed without fever or any subjective symptom, but with a prominence of the left side of the abdomen dependent on a smooth, firm, clearly defined, and non-sensitive tumor, extending from half an inch to the left of the umbilicus, and under the lowest ribs toward the lumbar region. Its lower border was on a level with the anterior superior spinous process of the ilium; and the whole tumor could be pushed up several inches toward the region normally occupied by the spleen, but in other directions was only slightly movable. No notch could be felt. Placing the patient on the right side with the left arm over the head, I found marked dulness on percussion over the tumor, and full resonance over the splenic region. No difference could be detected between the lumbar regions of the two sides in the back by palpation or percussion, either when the patient was in the erect posture, or when he was lying on his belly. No enlargement of lymphatic glands, and no apparent anæmia. His bowels had acted freely and regularly of late, and I made the diagnosis of enlarged and floating spleen. Dr. E. G. Cutler, of this city, kindly examined the man at my request, but without knowing my opinion of the case, and arrived at the same diagnosis. At Dr. Cutler's suggestion, Fowler's solution was ordered with the idea of attempting to reduce the size of the organ, but the patient did not follow up the treatment. He has been regularly at work at his trade ever since, without a moment's inconvenience, but still has his tumor, which, however, seems to have contracted some adhesions, as it is now but very slightly movable.

Except for the lack of any sufficient exciting cause, the history of the case would indicate that the dislocation occurred suddenly; and the enlargement may date back to his residence in the western part of the state, although he was not conscious of having absorbed the malarial poison.

The spleen is subject to various displacements; it has, for instance, been found within the left chest in cases of con-

genital defects, and of perforation of the diaphragm ; without the abdominal wall in cases of fissure, and of large umbilical herniæ ; in cases of transposition of the viscera, it occupies the right side of the body ; it may be forced out of its normal position by enlargement or distension of neighboring parts, such as very great effusions into the left pleural or the peritoneal cavities, or by abdominal tumors. Lying as it does immediately beneath the diaphragm, it descends somewhat on forced respiration, and when it is sufficiently enlarged to reach the margin of the ribs, this respiratory change of position is appreciable on palpation. Under the term "floating" or "wandering" spleen, however, I would include those cases, and those only, in which the *whole organ*, whether enlarged or not, has escaped from its normal position, the ligaments which held it in place being elongated or ruptured. However low down into the abdominal cavity, or however far toward the right side an enlarged spleen may extend, it cannot be characterized as "floating" as long as its upper part occupies the normal situation of the organ.

According to Morgagni,¹ the first recorded case of floating spleen is that of Baillou, 1578 ; and between that time and the present day, after a pretty thorough search of the literature of the subject, I have found 51 cases, more than half of which are so lacking in details that I abandoned the idea of tabulating and analyzing them as I had at first intended doing. Morgagni¹ finds ten cases recorded up to his time, but says he never met with a case himself, and upbraids Van Swieten for not having taken the trouble to give any details as to two cases which he said that he saw. Küchenmeister,² who published a monograph on this subject in 1865, gives Piorry the credit for having first made the diagnosis during life, all the previously reported cases having been first observed in the dissecting or post mortem room. Dietl³ put the

¹ De sedibus, etc., Epist. xxxix.

² Die Wandernde Milz, Leipzig, 1865.

³ Wien. Wochenschrift, 1854.

second case on record in 1854; in January, 1856, Tebault,¹ of Virginia, published two cases, the first which I have found recorded in America, and in the same year Dietl published several others. Since then, cases have been reported from time to time, in most of which the diagnosis was made during life.

Like floating kidney, the affection is much more common in women than in men. Rokitansky,² indeed, states in his *Pathological Anatomy* (edition of 1861), that it occurs exclusively in women, but this is a mistake. Two of the cases published since 1854, in which the sex has been noted, were in males, my own case and that of Buss;³ and six of the cases reported by the older writers were in males—in all, eight out of fifty-one cases. Bartholow⁴ reports a case in a man, but the diagnosis seems to me rather questionable, and I have thrown it out.

The two chief factors in the causation of dislocation of the spleen are undoubtedly mechanical elongation of the ligaments by the traction of an enlarged organ, and undue congenital laxity or delicacy of the ligaments. Dietl⁵ and Förster,⁶ attribute the condition chiefly to the latter; Klob⁷ and Birch-Hirschfeld,⁸ chiefly to the former; while Rokitansky⁹ lays stress on successive attacks of acute enlargement and consequent successive strains on the ligaments, abnormal length and lax attachment of which act as predisposing causes. I suspect that floating spleens are more common than would appear from the very small number of cases which have been reported, but even if I am correct in this supposition, they still remain very rare in comparison

¹ Am. Journ. Med. Sciences, Jan. 1856.

² Band iii. s. 291.

³ Times and Gazette, Nov. 7, 1868.

⁴ Western Journal of Medicine, March, 1868.

⁵ l. c. and Wiener Wochen, 1856, No. 23.

⁶ Path. Anat., p. 823.

⁷ Wochenblatt der Zeit. der Gesell. der Wein Aerzti, 1869, p. 597.

⁸ Path. Anat., i. p. 429.

⁹ l. c. and Zeitschrift der Wien., etc., 1860, p. 33.

with the wide distribution of the malarial poison in even highly civilized countries, and the frequency of chronic splenic enlargement, of malarial or other origin. Consider, too, the enormous size and weight which the spleen often attains without any other change of position than is necessarily involved in the enlargement, and it certainly does not seem far-fetched to assume that congenital structural peculiarity of the ligaments may often have something to do with the production of dislocation.

The far greater frequency of the condition in females naturally suggests inquiring as to the possible influence of pregnancy. Rokitsansky suggests that the relaxation of the abdominal walls, after repeated pregnancies, may favor its occurrence. Of fifteen cases analyzed by Küchenmeister with reference to this point, two were in girls under 14 years of age; in five, no mention is made of previous pregnancies; three were in multiparæ; and in five the dislocation was said to have occurred either during or following pregnancy. Ullmann¹ reports a case in which the dislocation occurred suddenly while the woman was running, Pirotais² one in which it seemed directly attributable to the woman's being thrown from a carriage, Kilpatrick³ one in which it seems to have been the result of the effort of getting into a light wagon, and then there are the cases in males, which show that the rôle of pregnancy is no very important one. Cruveilhier very properly calls attention to the great frequency of perisplenitis, and suggests that this is a protection against dislocation.

The most striking feature in the pathological anatomy of the condition is the change in the ligaments. The organ normally lies with its concave surface and hilus directed toward the right, is attached to the diaphragm by the

¹ Arch. Gén. V., série xii. p. 221.

² Gaz. des Hopitaux, 1874, 84.

³ Boston Med. & Surg. Journ., 1873, ii. p. 438.

phrenico-splenic or suspensory ligament, and to the fundus of the stomach by a fold of omentum—the gastro-splenic ligament—which encloses the splenic vessels as they pass in and out behind the upper border of the pancreas. The organ is least movable at its diaphragmatic attachment, and it is this phrenico-splenic ligament which, according to Klob, is the first to feel the traction, become elongated and ruptured; the spleen then falls over forward, lies horizontally in the body with the hilus directed upwards, and depends only from the gastro-splenic attachment and vessels; thus drawing the fundus of the stomach downward by traction on the ligament, and perhaps detaching the pancreas by traction on the vessels. Rotation may then take place, and the pancreas be wound round the vessels which become more or less diminished in calibre, or even obliterated, causing infarction and atrophy of the spleen itself, and thus contributing toward a spontaneous cure. In one of the three cases collected by Rokitansky from the records of the Pathological Institute in Vienna between 1820 and 1851, the vessels were twisted three times, and the spleen, which was still somewhat enlarged, was distorted in shape, and presented two spots of marked depression on its outer surface, with deposits of lime salts. In another of his cases, rotation of the organ had obliterated the artery and vein; and the spleen was reduced to the size of a goose-egg, and consisted of a cartilaginous capsule, with scattered deposits of bone, within which was a mere mass of detritus traversed by a few fibrous bands. Unless strong adhesions are contracted on the way, the spleen must continue to descend until it reaches the firm support of the pelvis. Rupture of the gastro-splenic ligament is a fortunate thing for the patient, the traction on the fundus of the stomach having been known to result in gangrene of the gastric wall and death.

After rupture of the ligaments, and obliteration of the vessels by rotation, it is easily conceivable that the remains of

the vessels also should rupture and the organ float freely in the abdominal cavity, or become almost entirely absorbed. Of the latter, I have found no instance; but Cabrolus is said, by Lieutaud,¹ to have found the spleen lying completely unattached in the abdomen of a man. I have been unable to find the original work of Cabrolus in which he makes this statement, either here or in the Library of the Surgeon General's Office, but give it for what it is worth. I have found reports of no less than four cases, and a mention of one other,² in which a floating spleen caused fatal obstruction of the bowels. In the case of Babesieu³ a portion of the jejunum was compressed against the spinal column by the elongated gastro-splenic ligament and vessels; in the case of Helm and Klob⁴ the lower part of the duodenum was compressed in the same way, though the cause of death was rupture of the stomach; in the case of Bozzi⁵ the ilium and cæcum were the seat of compression, and in that of Coomans and de Cnæp⁶ it was the ileum alone; in the case of Choisy,⁷ the particulars are not given. Bainbrigge⁸ reported a case which does not strictly come within the limits of this paper, but is so curious and unique that I will mention it briefly. A groom was admitted into hospital for fracture of the thigh; a few days after entrance he began to present symptoms of intestinal obstruction, and died within a week. On autopsy the cause of the obstruction was found to be a supernumerary spleen which lay in the omentum, had fallen down into the true pelvis, and thus compressed the colon against the brim. The usual seat of a floating spleen is one of the iliac fossæ, more commonly the right; and

¹ Voigtel—Path. Anat., Bd. iii. p. 142.

² Case of P. Frank.

³ Allg. Wien. Med. Zeit., Sept. 1877.

⁴ l. c.

⁵ Am. Jour. Med. Sciences, July, 1847.

⁶ Canstatt, 1869.

⁷ Bulletin Soc. Anatomique, 8, p. 79.

⁸ London Med. Gaz., 1846, p. 1052.

there, or elsewhere, it may contract more or less firm adhesions to neighboring parts or organs.

Symptoms may be very marked, vague, or entirely absent. In the cases in which the dislocation has occurred suddenly, there has been severe pain in the abdomen, with inability to stand upright; where, on the contrary, it has been gradual, inconvenience may be wanting or very slight; dragging sensations may be felt in the abdomen, or pressure on the bladder and uterus may interfere with their functions. In one of Kilpatrick's cases three abortions followed the appearance of the floating spleen, though the woman had previously borne three children at full term. In one of Tebault's cases the spleen was carried up by the uterus during a subsequent pregnancy into the left hypochondriac region, without giving rise to inconvenience.

The diagnosis of floating spleen should seldom be attended with special difficulty, and is in many cases very easy; complete absence of the normal splenic dulness being of course practically *sine quâ non*. A case may be imagined with persistent dulness in the splenic region, for instance, local enlargement of the left lobe of the liver, due to the presence of a hydatid cyst, as is suggested by Küchenmeister, but centuries may elapse before any such difficulty has to be met in practice. Even if the splenic dulness be absent, the abdominal tumor should not be decided to be a floating spleen, without excluding floating kidney of the left side, extra-uterine foetation, ovarian disease, faecal accumulation, and enlarged but not floating spleen; aneurism and cancer should also be added to the list.

As for prognosis, danger to life is threatened only from intestinal obstruction, and from dilatation and rupture of of the stomach; which, together, have caused death in seven out of fifty-one cases.

The line of treatment to be adopted in any particular case varies mainly with the recency of the dislocation, and

the degree of inconvenience to which it subjects the patient. I will consider the question of treatment from four points of view : according as it may seem desirable to do nothing ; to attempt permanent reduction of the dislocation ; to aim at alleviation or possible cure by reducing the size ; or, lastly, to excise the organ.

The let-alone policy is that which has hitherto been followed in most cases, possibly partly from the impression—in which I shared until I had gone into the question—that the lesion is one of little or no gravity, but mainly from the difficulty of being sure of doing less harm than good. In view, however, of the fact that the lesion involves possibilities of the greatest danger, I should in another case make more of a point of attempting cautiously to diminish the size of the organ, if enlarged, and to retain it in place as far as possible.

Piorry was the first to attempt to keep a dislocated spleen in place by means of a bandage, but with what success I have been unable to ascertain. In Pirotais' case the woman was unable to rise from her bed until a bandage was applied ; from this she obtained great and prompt relief, but whether the organ was kept permanently in place is not stated. In the case of sudden dislocation mentioned by Kilpatrick, the woman was put to bed, the foot of the bed raised ; the spleen pushed back into place and retained there by bandages. After several days the bandages were removed and the patient felt no subsequent inconvenience. We are left to infer that the reduction was permanent, but that fact is not directly stated. It is only in acute cases like these that there is much hope of effecting permanent reduction, and the question naturally arises as to its mechanism in case it is effected. If the ligaments be ruptured or materially elongated, the possibility of their repair or restoration to the normal length would seem in the highest degree remote ; and it appears to me more rational to seek for the cause in

the occurrence of adhesive perisplenitis, which might perhaps be further promoted by cauterization over the organ. Whether a bandage or appliance can be contrived which will keep the organ in place and admit of being worn for a prolonged period, without at the same time exercising injurious pressure on other parts, remains to be seen.

Enlargement plays so important a part in the production and intensification of dislocation, as to justify us in attempting to reduce the size of the organ. From the earliest times the spleen, especially when enlarged, has been regarded as an impediment to running. Democritus, Erisistratus, and Rufus of Ephesus, all regarded it as an useless appendage, nay, as positively injurious.¹ Plinius Secundus says, "This member hath a property by itself sometimes, to hinder a man's running: whereupon professed runners in the race that be troubled with the splene have a desire to burn and waste it with a hot iron. And no marvel, for why? they say that the splene may be taken out of the bodie by way of incision and yet the creature live neverthelesse: but if it be man or woman that be thus cut for the splene hee or shee loseth their laughing by the means. For sure it is that intemperate laughers have alwaies great splenes."² He also gives minute directions for preparing and taking a decoction of a plant called horsetail, and states that a three days' treatment suffices to "waste the splene of footmen and lackies."³ Celsus⁴ recommends highly drinking after meat the water in which a smith has often extinguished hot iron, "a remedy which very powerfully contracts the spleen." Its use was suggested by the observation that animals bred in the houses of smiths have very small spleens.

Various methods of cauterizing the splenic region, with the idea of diminishing the size of the organ, are described

¹ Burette.

² Hist. Nat., Lib. xi. 37-80, old translation.

³ Lib. xxvi. 13, 83.

⁴ De Medicina, Lib. iv. Cap. ix.

by the ancients. In the time of Hippocrates, the hot iron was thus used, as also a kind of dried mushroom, eight or ten of which were placed over the spleen and set afire. Paulus Ægineta¹ teaches a method of cauterizing in six places at once, with a three-toothed cautery. In the middle ages, also, we find cauterization practised on running footmen. Maebius,² who died in 1664, saw a runner of Count Tilly with a deep cicatrix in his splenic region, who attributed his great speed and endurance to an operation done on him by the physician of the Count. The doctor put him to sleep by a potion, made an incision over the spleen and applied the hot iron. The runner also stated that the same operation had been done on five others, but one of whom had died in consequence. Whether the cauterization was ever applied to the spleen itself must remain undecided, for the present at all events; but it does not seem likely that it was. The practice is spoken of almost exclusively in connection with athletes and running footmen, presumably a very healthy class of men, and was rather a matter of training than of medical treatment.

To hasten to modern times: if the enlargement is of somewhat recent standing and due to malaria, quinine and change of climate may be servicable. Cutler³ and Bradford have known the enormous spleen of a leucocythæmic patient to undergo marked decrease in size under the prolonged administration of increasing doses of Fowler's solution. Some hopes of good results would seem to be held out by parenchymatous injections of ergotin or other substances, or by electro-puncture, but further facts are needed to establish the real value of these procedures. Küchenmeister suggests that when the absence of adhesions permits, taking a hint from nature, artificial rotation may be attempted.

¹ Sydenham Soc. Trans., Book vi., c. 48.

² Burette.

³ Am. Jour. Med. Sciences, Jan. 1878.

The same writer also urges strongly excision of the floating spleen, if it be a serious inconvenience to the patient and other therapeutic measures have failed. Simon, Magdelain, and others, have written monographs on this operation. Simmons¹ briefly mentions fourteen other cases in connection with a case of his own; and a valuable collection of cases is tabulated in the Medical and Surgical History of the War. Martin's² recent case of successful excision of a floating spleen antiseptically, and some facts as to extirpation of the spleens of runners in ancient and modern times, facts which no modern writer on splenotomy has mentioned, as far as I know, are my excuse for going into this question in some detail.

Several writers of antiquity state that the spleen was sometimes actually excised from runners to give them greater speed; and Burette,³ whose careful study of the whole subject cannot be too highly commended, says, that though he can find no special instance of the operation, he believes that it was done in rare cases. There is a popular idea that splenotomy was practised on the running footmen of the middle ages, and Cabrolus⁴ states positively that it was done; but in Zedler's⁵ remarkable encyclopædia published early in the eighteenth century, it is, on the other hand, stated expressly that it was *not* done. Cabrolus wrote early in the seventeenth century, and was a medical man; whether the writer of the article in Zedler, from which I have quoted, was a medical man or not I cannot say, but credulity and the unscientific mind belong to humanity, and are confined to no one profession or calling. Bartholomus says that the Turks, if their old chroniclers are to be believed,

¹ Pacific Med. & Surg. Journal, Dec. 1877.

² Brit. Med. Jour., Feb. 9, 1878.

³ Mémoire sur la course des Anciens—Acad. Roy. des Inscriptions et Belles Lettres, 1713.

⁴ Ontleeding des Menschlycken Lichnams.

⁵ Universal Lexikon, Article Läufer.

had a special and secret means of removing the spleen of runners; from lay sources we hear of splenotomy being practised on the Indian runners of Texas,¹ and on the syces of Hindostan.² Now, though no one of these indications alone is worth much, when taken all together I think that some value must be attached to them, especially when we bear in mind the well-known impunity with which splenotomy is done on animals, and the uniformly favorable results which have followed the removal of larger or smaller portions of the organ in the human subject in cases of prolapse through a wound or injury of the left side. Sixteen of these cases—and the list is not claimed to be complete—are tabulated by Otis,³ in every one of which perfect recovery took place. So much for removal of the *healthy* spleen. A floating spleen is almost always, however, an enlarged spleen, and an enlarged spleen again is almost always an indication of a cachectic state of the system, which would probably tend to diminish the chances of recovery from any serious operation. What do the statistics of splenotomy for disease teach us? To the fifteen cases collected by Simons I will add five,⁴ making twenty in all. Six of these were successful, fourteen fatal; a mortality of 70 per cent.

Urbinate's case I have, unfortunately, not been able to consult in the original: as reported in the *British Medical Journal* it is said that the spleen was enlarged and floating, but the symptoms are not given nor is it stated definitely why the operation was undertaken. I must hence, provisionally, give Martin the credit of having been the first to remove the spleen simply for dislocation. His patient

¹ Beddoe—*Times and Gazette*, ii. 1867, p. 608.

² I am informed by old residents of India, that they have often heard of cutting out the spleen of these runners to spare them the stitch in the side.

³ *Med. and Surg. History of the War*.

⁴ For the cases of Ferrerius and Dorsey, *vide Med. and Surg. Hist. of the War*. For the case of Urbinate, *vide Brit. Med. Jour.*, Oct. 4, 1873. For Martin's, *vide same Journal*, l. c. For the case of Fuchs, *vide Prager Vierteljahrschrift*, 1873, Band ii. page 46.

suffered such inconvenience that she cheerfully accepted the risks, and the organ, which was but slightly larger and heavier than usual, was removed. She made a good and rapid recovery, and four months after the operation was perfectly well and free from discomfort.

Splenotomy is not an operation to be done lightly, but I think that I have shown some reasons for hoping that better results may be looked for in the future. Malassez and others have given us the means of obtaining a more accurate knowledge of the condition of the blood than lay within our power until very recently, thus enabling us to pick our cases more carefully; and the antiseptic method promises to rank as second only to the discovery of anæsthesia in enlarging the domain of surgery.

