

vomiting, and pain). 3. The rapid onset of anæmia. Three months later the patient became so anæmic that he could not work and there was so much gastric trouble that cancer was suspected. 4. The subsequent history of the case—that of pernicious anæmia.

(To be concluded.)

EXCISION OF THE SPLEEN FOR INJURY.

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ON Jan. 6th, 1899, a man was brought into the outdoor department of the Barisal Hospital, Bengal, by the police, whose report was to the effect that a quarrel had arisen between the patient and a neighbour, in the course of which they came to blows and the latter struck the former with a sharp-edged weapon (a *dao*) so as to wound him in the "stomach." My assistant surgeon (Babu Radha Nath Bose) on examining the patient at the time found that he had received a severe abdominal wound from which there was a dark congested-looking mass protruding, that considerable hæmorrhage had occurred, and that the patient's clothing had been stained, not only with blood, but also with mud, as though he had been working in the fields at the time when he received the injury. The patient was a well-built man, aged 45 years, by caste a Mahomedan, by occupation a cultivator, resident in the village of Nazirpur (police-station Gournadi). The symptoms of shock were well marked, for the man's face was pale, his lips were blanched and his hands and feet were cold; but he retained consciousness, there was no nausea or vomiting and there was no marked muscular relaxation. The pulse was comparatively feeble, but the heart-sounds were distinctly audible and apparently not much altered from the normal. On the left side of the abdomen, in the hypochondriac region and in the angle formed by the costal cartilage of the tenth rib and the left linea semilunaris, there was an incised wound, two and a half inches in length and three-quarters of an inch in width, and penetrating the whole thickness of the abdominal wall. The direction of the wound was from above downwards and slightly outwards so that the upper end, also somewhat wider, approximated more towards the middle line than did the lower end. Protruding outwards between the lips of the wound was a dark congested mass, a portion of the spleen. The lips of the wound had contracted tightly round the base of the projecting portion so as to prevent the return of venous blood. Moreover the capsule of the organ was incised to the extent of one and a half inches and the splenic pulp was bulging through this opening. Considering, then, the circumstances of the case, the fact that the injury had been inflicted some little time previously, and taking into account that the patient had been brought a considerable distance and that his wound had been exposed to septic influences, such, for instance, as contact with dirty clothing, I feared the effects of septic processes more than those of shock or hæmorrhage or other conditions. Thus I decided that it would be unwise to return to the abdominal cavity a portion of viscus which had been exposed so long and under such circumstances, especially as it seemed to me just possible that the peritoneal cavity might as yet be free from infection since the tight sphincter arrangement of the wound prevented the inflow of any fluid from the external surface. Of course there was the chance that the weapon which inflicted the injury had also carried septic infection into the peritoneal cavity, but even though such were the case it did not seem prudent to add to the dangers by wilfully returning a piece of septic spleen whose vitality was already lowered and whose substance would favour the growth of septic organisms in the patient's present condition. Yet at the same time I was unable to satisfy myself that the muscular contraction at the seat of injury had been so complete as to have excluded all chance of infective material having passed from the wounded surface of the organ to the portion still within the abdomen. The possibility of such a spread impressed itself the more upon me when I considered the dorsal decubitus of the patient and the consequent action of gravity. Under the circumstances, therefore, I looked upon the entire spleen as an infected organ, and I satisfied myself that its complete removal would minimise the risks of the patient.

Operation.—My first step was to administer to the patient half-drachm doses of compound spirit of ether and aromatic spirit of ammonia by way of stimulant. I had no fear of hæmorrhage at present, as the capillaries on the wounded surface of the abdominal wall had long ere this ceased to bleed, whereas the hæmorrhage from the injured organ and its capsule were held in control by the muscular edges of the wound. My next care was to wash the wound and the surrounding parts with the greatest precautions, and for this purpose I used by preference a solution of carbolic acid in the first instance of the strength of one part of the acid in 50 of water. This antiseptic substance penetrates more deeply into the tissues and thus finds its way into crevices far more readily than does the perchloride of mercury. Next, taking a long strip of lint about two inches wide and wringing it out of the antiseptic solution, I sprinkled it over with a mixture of equal parts of iodoform and boric acid and packed it round the base of the protruding tongue of spleen so as to prevent the ingress of any fluid into the peritoneal cavity. At this stage chloroform was administered and when the patient was thoroughly under the influence of the anæsthetic I secured the protruding mass by means of an ordinary hæmorrhoidal clamp such as that devised by Smith. This served a double purpose, for it acted as a ligature, preventing the inflow of any blood from this part of the organ and it also kept the projecting portion from slipping in when I took the next step in the operation. This consisted in extending the abdominal wound downwards for a convenient distance; in the present case one inch sufficed. In doing this, however, I adopted the plan of cutting at first through skin, fasciæ, and muscular layers only, then arresting the hæmorrhage completely, and finally extending the peritoneal opening. The spleen was quite isolated and its attachments, especially the gastro-splenic omentum, were lax, and this allowed of my lifting the whole organ out and bringing the pedicle to the surface-level. I carefully avoided either pressing upon or pulling the spleen more than was absolutely necessary, so that I ran no risk of either squeezing infected material inwards or of rupturing the vessels at the hilum. I next proceeded to ligature the pedicle and for this purpose I used stout chromicised carbolicised catgut, believing that the chromicised material does not so readily absorb septic matter as ordinary catgut or silk, which latter is also apt to become too loose as the enclosed portions contract. I applied double ligatures and before removing the parts external to the outer ligature I passed two sharp-pointed probes through the substance of the pedicle between the two ligatures. The probes were at right angles to one another; their sharp points were protected by means of two pieces of cork, their ends rested upon the surface of the abdomen, and their function was to support the stump which would remain after removal of the main body of the organ. Having done this I cut away the entire spleen external to the outer ligature. The remaining stump I treated exactly like the stump of the uterus in a Porro's operation—that is, at the wound which I closed round it. The wound was then dressed in the ordinary way with perchloride of iron. During the whole operation the greatest care was taken to prevent any fluid from passing into the peritoneal cavity; no appliance was introduced into that cavity, and by protecting the abdominal opening with a piece of gauze wrung out of carbolic lotion any air that passed into the peritoneal cavity was, as it were, filtered through an antiseptic medium. The spleen weighed $12\frac{1}{2}$ ounces, and measured six inches in length, four and a half inches in breadth, and one and a half inches in thickness. In colour the organ was dark. It had, moreover, a slight constriction round the part that had been held by the abdominal wound.

After-treatment.—The patient was kept at absolute rest and for the first 48 hours was fed entirely on milk. Pills containing each a quarter of a grain of the extract of opium and the same quantity of the extract of belladonna were administered at intervals in order to keep the patient at perfect rest and, by producing an artificial constipation, to avoid all straining efforts. At the end of 48 hours I dressed the wound with very great antiseptic precautions, the process being repeated every second day thereafter. On the eighth day after the operation (Jan 14th) the healing process had advanced so far as to allow of the removal of the probes, and a fortnight after the operation (Jan. 20th) the wound had completely healed up. On the following day I permitted the patient to be removed to the Barisal jail as a warrant had been issued for his

arrest. I continued, however, to keep the man under observation in the jail hospital, and after an interval of some days I transferred him to the "convalescent gang," where he was kept on special diet and being an "under trial" prisoner he had no work to do. On Feb. 3rd he was able to appear for trial in court. During the whole period of convalescence the patient's temperature never rose more than one degree above the normal, his pulse gradually returned to a healthy condition, and his appetite remained good. The recovery made by the patient was remarkably speedy, and the last report I had of him was in a letter dated Nov. 16th, 1899, which stated that he was in good health and able to attend to his ordinary occupation as in former times.

I may add that no vomiting occurred either during or after the operation and that no hæmorrhage or other complication took place during the period of recovery. An examination of the patient's blood made after the operation revealed no very marked condition, but having had no occasion to make such an investigation before the removal of the spleen I am unable to make any comparative statements. From the somewhat complicated physiological functions which the spleen discharges during health as a member of the hæmopoietic system, we should be led to expect important changes in that system, and especially in the blood, after total removal of the organ in question. Such changes have from time to time been observed. Thus, considering that the chief functions which the spleen discharges in the physiology of the human system are concerned with the production of white blood-corpuscles, the breaking down of the red blood-corpuscles (hæmolysis), and the metabolism of proteid substances, the breaking down of hæmoglobin—the change we should most of all look for after removal of such a body is an alteration in the relative proportion between white and red corpuscles in the blood. This has been noticed by several observers. Moreover, it frequently happens that the lymphatic glands take on a condition of hypertrophy to compensate, as it were, for the loss of the spleen. These lymphatic glands being engaged in the production of the white corpuscles of the blood, their tendency is to increase in size and in activity and to correct the alterations in the blood often to the extent of making them inappreciable. Among others Czerny and Kocher have noticed enlargement of the lymphatic glands under such conditions. In the case that was under my care a close search revealed a single superficial lymphatic gland belonging to the femoral group on the left side swollen to the size of a small bean. It was situated a little below and to the inner side of the saphenous opening; slight pressure applied to the long saphenous vein over the lower margin of that opening in the fascia lata was sufficient to make the vessel stand out external to the swollen gland. Besides, the swelling could not be traced to any other cause; it was not present at the time of the operation, but appeared on the third day after, and it gradually disappeared in the course of a week without the aid of any external application.

The operation of extirpation of the spleen, or splenectomy as it is called, has been performed for many causes and with a varied degree of success. Leucocythæmia, chronic congestion of the spleen, albuminoid degeneration, syphilitic enlargement, simple and malarial hypertrophy of the organ, floating spleen, hydatid disease, cystic spleen, sarcoma, abscess, rupture, and wounds constitute the list of conditions for which the operation has been attempted. In leucocythæmia, chronic congestion, albuminoid degeneration, and syphilitic enlargement the results obtained from this operation have shown so high a mortality as to render this mode of treatment unjustifiable under the circumstances. In cases of simple and malarial enlargement and of floating spleen the results have been considerably better. Vulpius of Heidelberg in the tables of cases he has collected quotes two instances of ruptured spleen both of which ended fatally. The operation is to be considered as one which is exceedingly severe, which should only be undertaken when the surgeon is perfectly satisfied that it is the course of treatment which of all others under the prevailing circumstances is calculated to diminish the risks to be borne by the patient, and when the operator is quite certain regarding the efficacy of his antiseptic arrangements. Besides the dangers common to all forms of laparotomy, especially infection of the peritoneum and its results, the great fear in this particular operation is that of hæmorrhage from the vessels at the hilum of the spleen; in the case which I have described the

risks of such an accident were minimised to a great extent by the mode of procedure which I adopted.

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THE PATHOLOGY AND TREATMENT OF APPENDICITIS.¹

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IN the discussion which took place recently before the Medical Society of London on the Prognosis of Appendicitis² and which was introduced by Dr. H. A. Caley this observer and some of those who spoke made use of clinical statistics to a large extent. This method of inquiry is obviously of value, but it has not hitherto carried conviction to the minds of physicians and surgeons. The reason for this is simple. Taking the 99 cases of simple appendicitis and perityphlitis, on which Dr. Caley's remarks had been based, in which the patients were said to have recovered it is reasonable to ask how this is known to be true. A certain proportion of them must have had concretions in the appendix. The attack may have subsided, but the patients had not recovered and the appendicitis was sure to recur. It would be just as reasonable to say that a patient with stone in the bladder had recovered because after rest in bed an attack of cystitis had subsided. Without doubt some of the 99 cases relapsed and the patients went to other hospitals and were there included amongst the severe cases with perforation, gangrene, or septic peritonitis. I venture to think that appendicitis cannot be correctly prognosed until it is possible to infer from the clinical symptoms the pathological changes proceeding within the appendix. I do not intend to discuss the nomenclature of diseases of the vermiform appendix: much confusion prevails and the classification adopted by many authors is illogical. When inflammation originates in the vermiform appendix I intend to call it appendicitis and to add terms to indicate the effects which the disease has produced, such as ulceration, perforation, gangrene, the various inflammations of the peritoneum, of the broad ligament of the uterus, of the portal vein, and so forth. The remarks which follow are based upon the histological examination of 53 cases of appendicitis ranging from the slightest to the most acute. The specimens have been obtained from cases which I myself had operated upon and of which I know the histories.

The first group of cases is that in which suppuration was absent. Some of these cases come under the head of "appendicular colic." In these so far as is known no clear attack of appendicitis has ever occurred. They were characterised by slight tenderness on pressure over some part of the iliac fossa, by disorders of digestion, and by occasional attacks of transient pain not infrequently mistaken for renal colic.

[Regarding the normal anatomy of the appendix Mr. Lockwood directed special attention to the lymphoid follicles and the lymphatic system of the appendix. The continuity of the sub-mucous and sub-peritoneal tissues through numerous gaps (hiatus muscularis) in the muscular coats was pointed out and the paths by which inflammatory and infective inflammations of the mucosa spread to the peritoneum were demonstrated by lantern-slides.]

In a case of appendicular colic, such as was described by Talamon, a healthy young woman suffered for 18 months from abdominal pains. During the last six months she had been unable to follow her occupation. The pain was referred to the right side of the abdomen and to the right iliac fossa. It had been diagnosed as being caused by colic. The appendix was removed. To the naked eye it appeared normal. Microscopical section, however, showed the lumen to be filled with epithelium, mucus, granules, and crystalline bodies, and crowded with diplococci, small ovoid bacilli single and in pairs, small clumps of staphylococci and streptococci in chains from four to six, and some long slender bacilli. In the micro-photograph the mucosa of the appendix is seen to be ulcerated, and these various bacteria

¹ An abstract of a paper read in introducing a discussion before the Medical Society of London on Jan. 22nd, 1900.

² THE LANCET, Dec. 2nd, 1899, p. 1518.