patient move the joint spontaneously and vigorously, to cause the effusion to be forced out. Passive movements do harm. Under this treatment many even severely affected joints have recovered with free movement. To encourage movement of any sort while inflammation is still present in a joint, or indeed in any part, is contrary to all previous teaching, yet the recommendation is justified by results, as I have been able to prove to my satisfaction on several occasions during the war and since my return to civil practice. I wish to point out that the same factor as is involved in the use of active movements in joint sepsis is revealed at work in cases which recover after operation for peritonitis or pleuritis. In these, normal movements of bowel or lung speedily occur, and, mark you, it is better to dispense with drainage. If, in peritonitis, the bowel is so badly affected that peristalsis is paralysed, or if, after operation for pleurisy, the lung does not expand, recovery is, to say the least, a doubtful issue, even when drainage is established. In some cases of peritonitis, when the bowel is paralysed, temporary drainage of the bowel to remove its poisonous contents may have to be carried out in preference to other treatment, owing to the precarious state of the patient, or in bad cases of empyema all that may be possible is simple drainage of the pleural cavity. It seems to me, however, that in all these types of cases we are gradually being forced to rely more on the natural powers of the patient than on any artificial aids we can give. The rôle of the surgeon in such cases is merely to remove obstacles to natural processes of cure and then to clasp his itching fingers. My war experience has augmented the conclusion to which I had previously arrived, that, generally speaking, the use of drains must be included in the category of meddling surgery, or, in other words, that the necessity for the use of a drain is evidence of imperfect work. The trouble is that none of us can be sure of doing absolutely perfect work. Human limitations and mechanical weakness demand the occasional use of drains. For example, drainage of dead spaces which cannot be obliterated and drainage of a gall bladder to prevent distension of a sutured common duct may be necessary for safety. We must remember that, in the former instance, drainage is for removal of nutritive fluid only—that the presence of the foreign body, the drain, be it ever so soft, favours the growth of organisms. The less expert the operator, the greater the necessity for drainage.

One wonders whether drainage of septic joints, after removal of the cause of the sepsis or of the obstacle to healing, is really necessary any more than in a case of peritonitis. One wonders how long it will be before ordinary acute peripheral abscesses will be freely opened, wiped out, and immediately closed again by well-judged suturing. For years past I have been performing "delayed primary suture" in such abscesses.

As Wilms has shown, and as I had previously experienced during several years before the war, absolute fixation after so-called aseptic operations on joints is really a bar to rapid restoration of function. Is not Wilms's principle apparent in rational after-treatment of all sorts of cases? Should we not always encourage patients voluntarily to exercise normal functions as soon as possible, instead of interfering with natural processes by coddling them too long in bed, by using massage or electrical stimulation and other artificial so-called helps, when really the patient can better help himself?

6 and 7. Two instances of development of work at home deserve, I think, special mention. One was the enormous strides made by many surgeons in orthopaedic surgery in its various branches—bone-grafting, nerve-suture, and so on—and in appreciation of other than purely operative measures in orthopaedic treatment. This was largely due to the strenuous work of Sir Robert Jones, with whom I had the honour of being intimately associated for a considerable time. Another instance was the organization of the treatment of amputation stumps. Some of you may know from bitter experience what a nuisance a stump may be in itself, and that an artificial limb must receive very skilled attention before it is really serviceable and comfortable. Special centres have been instituted in various parts of the country to provide such skill for numberless sufferers. Sir J. Lynn Thomas of Cardiff has estimated that before the war there were 40,000 persons in the country who had lost one or more limbs. Surely this surprising fact is enough to make us preserve

at least some of these centres where the skill acquired will be still available, and to which we may send civilian patients to be properly fitted with artificial limbs and to be trained in their use.

I have said enough. I am afraid that I have dealt with my subject in a somewhat crude and superficial manner, but I hope that the suggestions which I have expressed may stimulate you, who have to deal with future developments, to think seriously and broad-mindedly about these and kindred subjects and to take an active part in the solution of the problems which are entailed.

Observations

ON

SPLENIC ANAEMIA: BANTI'S DISEASE.

PART OF THE BRADSHAW LECTURE ON THE SURGERY
OF THE SPLEEN.*

BY

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"BANTI'S DISEASE" is the name given to the condition described in 1863, and again in 1894, by Guido Banti of Florence. In 1866 Gretzel described a clinical condition of anaemia associated with splenomegaly to which Griessinger applied the name "splenic anaemia." The case occurred in a child 10 months old who suffered from dysentery and severe anaemia with considerable enlargement of the spleen, and enlargement, less considerable, of the liver and lymphatic glands. Examination of the blood showed that the proportion of white to red cells was not increased; the condition was therefore not leukaemic. In 1871 Wood described a "splenic form" of pseudoleukaemia, and reported a case in which the spleen was greatly enlarged, and there was severe anaemia without leucocytosis. Banti, in his later description mentioned above, considered the disease as possessing clinically three stages, merging gradually into each other. These stages were:

1. One in which there was enlargement of the spleen and a secondary anaemia, the duration being three to twelve years.
2. One in which the liver gradually enlarged, and the amount of urine underwent progressive diminution; the duration was brief.
3. One in which the liver gradually shrank in size and ascites appeared, the symptoms being those of an ordinary atrophic cirrhosis; the duration of this stage was between one and two years.

The disease was invariably fatal, and death occurred either from haemorrhage or from autointoxication from cirrhosis.

Clinical History.

Splenic anaemia was defined by Osler as "an intoxication of unknown nature characterized by great chronicity, primary progressive enlargement of the spleen which cannot be correlated with any known cause, anaemia of a secondary type, with leucopenia, a marked tendency to haemorrhage—particularly from the stomach—and in many cases a terminal stage with cirrhosis of the liver and jaundice." The clinical features of the disease, then, are the following:

1. A very chronic course, in which the symptoms progressively and steadily increase in severity, without amendment, and without any hope of spontaneous recovery.
2. A slowly progressive enlargement of the spleen. This is the first of all evidences of disease; the bulk of the organ undergoes an increase, at first apparently slight, but later more rapid. The ratio of increase probably remains unaltered throughout. The enlargement may finally be very considerable, though it is rare for the spleen to become as large as in myeloid leukaemia, or in some cases of Hodgkin's disease, or in malaria, or in Gaucher's disease. The spleen is not altered except in bulk, so far as physical examination shows; the surface is smooth, the notches apparent; there is no tenderness, nor is a friction rub felt or heard. It is said that a "bruit de diable" has been heard (Sippy, Rolleston) "due to eddies produced by slight torsion of the dilated veins in the gastro-splenic omentum or of the splenic vein." Seeing that clinical recognition of splenic enlargement is not possible until the

* Delivered before the Royal College of Surgeons of England on December 6th, 1920. The lecture is published in full in the *British Journal of Surgery*, January, 1921.

spleen is at least double the normal size, it is more than probable that the inaugural and early symptoms of splenic anaemia are quite unrecognized.

3. *Changes in the blood* are of the type found in secondary anaemia. The red cells may drop to less than 2,000,000 per cubic millimetre; the average number is one-half of the normal. The colour index is low. In a series of fifteen cases Osler found the number of red cells to be 3,425,000 per cubic millimetre and the haemoglobin 47 per cent. A recent haemorrhage will of course affect the count very considerably; though it has often been observed that recovery after a haemorrhage is rapid, and that within two or three weeks the blood count may so improve as almost to reach the normal. The white cells are never above the normal unless there has been a recent haemorrhage, or an inflammatory complication is developing. Leucopenia is the rule. In Osler's case the average count was 4,520.

4. *The tendency to haemorrhages* is remarkable. Haematemesis especially is seen, occasionally with copious melaena. Other forms of bleeding are also mentioned in recorded cases: epistaxis, purpura, and haematuria are the most commonly seen. The amount of blood lost, especially from the stomach, may be enormous. I have seen two cases in which the apparently pure blood vomited within a couple of hours measured over three pints. Osler records a case in which three quarts of blood were lost within thirty-six hours. Recurrence of the haemorrhage is frequent. A remarkable case is related by Hutchison and Ledingham of a woman who was admitted to the London Hospital on account of severe haematemesis no less than thirteen times within a period of fifteen years. The blood comes in such cases, it is believed, from oesophageal varices and dilated vasa brevia, both of which are found in a large proportion of the cases.

5. *Affection of the liver.* In the later stages of the disease the liver enlarges, and presents the clinical pictures of Laënnec's cirrhosis. Ascites is present with the hepatic enlargement, or in some cases without it. This terminal condition, in which the liver is enlarged and dropsy is present, together with the earlier conditions described, is often spoken of as "Banti's disease"; but if this latter term is retained it is perhaps wiser to use it only as a synonym of "splenic anaemia."

6. *An unknown causation.* The discovery of a cause for the splenic condition removes the case from the category of splenic anaemia. As I have said, the term "splenic anaemia," as originally used, included a group of diseases characterized by certain clinical features common to them all. Upon this group encroachments have steadily been made, and may well continue to be made, as our knowledge of the etiology of special diseases becomes by degrees more accurate.

7. *Other phenomena of less importance* may briefly be enumerated. A general enlargement of lymph glands is not present. Until the latest stage there is no alteration of the urinary function. Occasional attacks of heaviness in the epigastrium, flatulence, and indigestion are observed, which lead, when haemorrhage occurs, to a diagnosis of "gastric ulcer." Such dyspepsias are less frequently seen than might be supposed. Rarely there may be slight pigmentation of the skin. If jaundice is present, the case is not one of splenic anaemia.

Differential Diagnosis.

This, as a rule, is not difficult. The mistake I have most commonly seen is the making of a diagnosis of *gastric* or *duodenal ulcer*. I have now seen 5 cases in which a patient suffering from splenic anaemia was referred to me as an example of these diseases. The absence of a clear history of dyspepsia, the presence of an easily palpable spleen, and the blood changes, soon revealed the true condition. The contrary mistake may be made. Rolleston relates the following case:

"Some years ago a middle-aged man was under my care in St. George's Hospital. He was very anaemic, and with a history of recurrent haematemesis. There was a tumour which appeared to be an enlarged spleen, and the condition was regarded as splenic anaemia. The necropsy showed that the tumour was a large hydatid cyst in the left kidney, and that a chronic gastric ulcer was responsible for the repeated haematemesis."

In any doubtful case an x-ray examination would almost certainly clear away the uncertainty and demonstrate the presence of a chronic gastric ulcer.

Cirrhosis of the liver has occasionally presented difficulties in diagnosis. The number of cases in which the splenic enlargement is considerable, and the hepatic enlargement slight, must be excessively small. That the spleen may be much enlarged in cases of Laënnec's cirrhosis is certain; and in such a condition a copious haematemesis might well raise a doubt as to the true diagnosis. Naunyn and others consider that splenic anaemia is merely a type of hepatic cirrhosis in which the liver changes are relatively slight, at least until the final stages are approaching. If a patient is first seen when the spleen is grossly enlarged, the liver cirrhotic, ascites abundant, haemorrhages recurrent, and ill health and emaciation advanced, it is not certainly possible to say whether the case is one of advanced Laënnec's cirrhosis or is in the terminal stages of Banti's disease. The accurate diagnosis is, however, made without difficulty if the earlier stages of the disease are carefully sought.

Syphilitic enlargement of the spleen and liver may be associated with a moderate degree of anaemia. In such cases the

symptoms of splenic anaemia are reproduced with remarkable accuracy. The differential diagnosis is achieved by a close study of the history, by a discovery of a positive Wassermann reaction, and by a recognition of the effects of antisyphilitic treatment. The latter, however, is not always successful. W. J. Mayo records five cases in which he removed enlarged spleens in conditions of chronic intractable syphilis with severe anaemia, when the patient had been resistant to careful treatment for syphilis, carried out during a period of several months. After removal of the spleen the anaemia rapidly disappeared and the syphilis was cured with comparatively mild antiluetic treatment such as had previously failed to affect either the syphilitic condition or the spleen. Coupland records a case in which the spleen was removed for "splenic anaemia" with much benefit; the patient died two years later, and syphilitic disease of the liver was found.

Pathogenesis of Banti's Disease.

The fact of utmost significance in connexion with the causation of this disease is that it is cured or arrested by removal of the spleen. This fact may be accounted for either by assuming that the disease is primarily and essentially located in the spleen, or by assigning to the organ the rôle of modifying the action of some agent situated elsewhere in the body. If the disease is primarily splenic, a search for a specific microbic infecting agent should ultimately be successful. Hitherto no convincing evidence of this has been found, although Hollins has argued strongly in favour of incriminating the colon bacillus. There is scope for further research in this direction; and the organ removed during life, if straightway examined, should provide profitable material for routine bacteriological investigation.

The enlargement of the spleen has been attributed to excessive haemolytic activity by those who consider the disease to begin in some other part of the body. But such a view does not sufficiently explain the fibrosis which is the outstanding histological feature of the disease. A chronic infective process would account for the enlargement as well as the fibrosis, and accord better with the absence of undue haemolysis of the red blood cells. In splenic anaemia the red cells never show "fragility." If there is a change the corpuscles may show increased rather than diminished resistance.

The anaemia, in like manner, may be regarded as an incident or as an essential part of the disease. Rolleston, a very distinguished authority, does not regard the anaemia as primary; he believes it to be secondary to attacks of very severe haemorrhage, chiefly because he finds that regeneration of blood takes place after these events. This view, however, is, I think, subject to the criticism that such severe haemorrhage is not invariable, and that the substance elaborated in the spleen need not be capable of affecting the bone marrow until after it has left the liver, where it has undergone modification. Further, whatever the poisonous substance may be, it need not completely arrest blood-cell development. A parallel case is, I think, sometimes furnished by subjects of leukaemia in which an intercurrent infection supervenes, with a temporary restoration of the normal blood picture.

Hollins regards the disease as being due to an active "intoxication" produced by the colon bacillus, whose "colilysin" brings about the anaemia, whilst its actual presence in both spleen and liver accounts for the fibrosis of each organ. This view would put every kind of cirrhosis of the liver on the same level, because "colilysins" could not be expected to vary radically in their action. The facts would be better met were it suggested that the spleen harbours various organisms, some of which only excite a local fibrosis, others induce a simple cirrhosis of the liver, and still others produce that form of cirrhosis associated with Banti's disease, with a toxic anaemia, and other specific symptoms.

In respect of the haemorrhage which is so conspicuous and alarming a feature of some cases, Rolleston considers that the enormously distended vasa brevia rupture into the stomach as a result of the torsion of the splenic vein caused by the great bulk of the organ. This opinion is certainly correct in many cases. The haemorrhage is so profuse, and so swiftly escapes from the stomach, that large vessels must be implicated. Such vessels as Rolleston describes are often seen in operations upon cases of splenic anaemia when abundant haematemesis has occurred. But this cannot, I think, be the whole explanation. The relationship between enlargement of the spleen and gastric haemorrhage is cryptic, but certain; for, as Balfour was the first to show, removal of the spleen may cure a patient

whose life has been jeopardized by severe and recurrent haemorrhages from the stomach. Gastric haemorrhage is known to be toxic in origin in certain cases, as, for example, those in which there is a lesion in the appendix, intestine, or gall bladder; and those also in which the lesion lies in the spleen or liver, or both.

Treatment.

The only treatment for splenic anaemia is splenectomy. The appropriate moment for the removal of the organ is chosen. It is inadvisable to operate soon after a grave haemorrhage, or when the spleen is extremely large. In the latter case, the effect of radium on the tumour should be tried; almost certainly it will cause a rapid and considerable shrinkage in the organ. If this should happily be the case, splenectomy is done when the spleen is at its smallest, and before it has begun to enlarge afresh, as it will certainly do after a few weeks. It is imperative to operate upon cases of this disease as early as possible. No other form of treatment needs consideration; the dangers and difficulties of the operation increase with the lapse of time; early operation means a more certain chance of recovery and a quicker convalescence. In the later stages the mortality of operation is higher, amounting to 25 per cent., as compared with an average of about 10 per cent. In the terminal stages operation becomes so dangerous that only the inevitably fatal outcome of the unhealed disease justifies its performance.

The degree of improvement that may take place is astonishing, even in the late stages of the disease, with advanced involvement of the liver. It is, as W. J. Mayo says, an evidence that the great power of the liver to regenerate its specific cells is utilized to the full.

The difficulties of the operation are greater in splenic anaemia than in any other disease. In almost all cases adhesions binding the organ especially to the under surface of the diaphragm are present. They may be numerous and exceedingly dense, and their separation may cause a copious and grave haemorrhage. But they are never so dense nor so strong as to prevent the completion of the operation. The details of the operation in other respects are the same here as elsewhere. At the Mayo clinic up to September 20th, 1920, 73 operations had been performed, with 9 deaths, equal to 12.3 per cent. The after-results are excellent; the rather high operative mortality is due to the technical difficulties of the late cases, which, apart from operation, would all be fatal.

ON THE END-RESULTS OF COLECTOMIES FOR INTESTINAL STASIS.*

BY

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I propose to give here the results of complete colectomies performed in the years 1913-14. The war necessitated for me, as for many of us, a beneficial patience, in that "cures" were not too easily claimed by too immediate publication, and the term "end-results," tautological, but well understood, will be, I think, here justified.

The cases are only four in number, and one of them died soon after the operation. No excuse is necessary for bringing to notice such a small number, for it is of the small numbers, even of the solitary cases, that the profession desires, and ought to know. If the very wide usefulness claimed for this operation is justified, it ought to be very widely practised; the reasons for its necessity, its results, immediate and remote, and its mortality cannot be too well known.

I had long been interested in the work of Sir Arbuthnot Lane, and having, through his kindness, seen several of his cases and both watched and assisted at the operation of colectomy, I operated on these cases, which were selected as being advanced in type. The details and immediate results are recorded in the BRITISH MEDICAL JOURNAL of 1914,¹ and these I will not now repeat. The "end-results" of the three cases are as follows:

CASE I.

W. C., male, aged 30 at time of operation on November 6th, 1913. I saw him on March 3rd, 1920, six years and three months after the operation. Back at full work as a bricklayer; feels a different man to what he felt before the operation; is no fatter. Quite all right until six months ago, since when he has had occasional abdominal pain, sickness, and diarrhoea. He is a healthy-looking man, with none of the stigmata of stasis. There is a large divarication of the recti, for which he wears a useless flannel binder. I wrote to his doctor, recommending a truss belt and attention to the teeth. I heard from the patient on August 5th that he felt very much better now that he had the new belt, that his teeth had been extracted, and he hoped to have the new set shortly.

CASE II.

A. M. S., female, married, two children, aged 34 at time of operation on March 2nd, 1914. I saw her on April 20th, 1920, six years and two months after the operation. She has got much fatter since the operation, takes food all right, and feels a different woman. Her friends have noticed that she has "cleared wonderfully." She has had two more children since, one now aged 4 and the other 2 years. All right until a few months ago, when she began to have lower abdominal pain and was constipated, her bowels sometimes not acting for a week. Her menstrual history was that her periods had always been profuse and frequent, that from January 14th to March 13th, 1920, there was no period, and she thought she was pregnant; on the latter date she had "flooding," and then a period on April 5th. She is a well-nourished, healthy-looking woman. The abdominal wound is soundly healed and she wears no support. The lower abdominal swelling and tenderness I found on vaginal examination to be associated with an enlarged uterus. I sent her on the same day to Dr. Ewen Maclean, who kindly saw her at once and pronounced her three and a half months pregnant, the fundus of the uterus being inclined backwards and to the right, possibly from parietal adhesions. He considered—the symptoms and physical signs notwithstanding—that miscarriage was not inevitable; also that parietal adhesions were not incompatible with the birth of two children subsequent to the operation. I heard from her on August 6th that the pregnancy was progressing naturally, and recently her doctor, Dr. McMichael of Vowchurch, Hereford, has written to me to say that she was confined on September 29th last and is going on well.

CASE III.

C. W., female, married, five children, aged 44 at the time of operation on April 30th, 1914. I was not able to see her myself, but Dr. T. E. Lloyd of Abergavenny kindly wrote as follows under date March 7th, 1920, five years and ten months after the operation: "Mrs. W. showed me your letter and I promised to write to you on her behalf. She is quite a different person, stout and well, with the exception of occasional attacks of diarrhoea, which I believe are neurotic. She used to be more or less constantly on one's list, but I hardly ever see her professionally now." I can supplement this from my note when I saw her five months after the operation, which says that she had then put on a stone in weight, her friends say she looks quite different, she is better than she has been for years, fat, healthy-looking, with a clear complexion; strong abdominal scar. She herself wrote on August 14th, 1920, saying that previous to the operation she had been under medical treatment for years, that since she has had excellent health and feels quite a new woman, that her people think she is a miracle and that she has got stout, her present weight being nearly 11 st.

What, then, are the end-results in these three cases? In all great improvement, which in the last two might be termed complete success. The qualifying details are: In the first case a ventral hernia with dyspeptic symptoms; in the second, adhesions, fortunately not interfering with pregnancy; in the third, diarrhoea occasionally. It is also to be remembered that a fourth case died after the operation.

There is an operative parietal infection in these and similar cases, which is, I think, too lightly regarded, being not referred to or just mentioned in the recording of operation results. As the aseptic precautions taken by operators are modern, minute, and successful under other circumstances, it is justifiable to regard this infection as coming from within. Gross infection from cut bowel ends should be avoidable, and the only explanations which suggest themselves are either that in toxic people there are micro-organisms in the peritoneal cavity which it can put up with, but the parietes cannot; or, that micro-organisms in the depths of the parietes are stirred into activity by the injury inflicted. Possibly the poorly vitalized parietes cannot deal with the few external micro-organisms which probably always remain in the skin and in its ducts, but this I regard as unlikely. The usual germ in the infection is *B. coli*. It may be that cultivations have been taken from peritoneal cavity or from cut parietes at the commencement of an operation: I do not know that this has been done, but it would be useful. That parietal infection is a

* A paper read to the Cardiff Medical Society, November 9th, 1920.