ON APPENDICOSTOMY AND ON APPENDICÆCOTOMY AS A SUBSTITUTE FOR CÆCAL COLOTOMY: APPENDICOSTOMY AND ENTEROSTOMY IN THE TREATMENT OF TYPHOID FEVER.

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IN the past winter I have had the opportunity of using the appendix as a spout for giving egress to fæces in a case in which it would otherwise have been necessary to perform a cæcal colotomy. In a case under the care of Dr. James Crombie¹ mentioned by me in a former paper appendicostomy was performed partly with this object. In all other published cases of appendicostomy the operation has been performed wholly for the purpose of admitting the injection of fluids into the large intestine. The question was, Could the appendix be sufficiently dilated? I felt almost sure it could because I have seen it so dilated by pus, by large concretions, and by intussusception of the appendix.

In the case which I am about to relate I was a little discouraged at first by finding a very slender appendix, one that seemed, in fact, atrophied. Accordingly, on Dec. 21st, 1905, I operated in the following manner so as to be prepared for possible non-dilatability of the appendix. Drawing an imaginary oval line (O) on the cæcum and around the base of the appendix, with the latter occupying an eccentric position in the oval, I stitched this oval line to the margin of the parietal peritoneum near the lower angle of the wound. (See illustration.) I then brought the appendix obliquely through the substance of the abdominal wall in the parietal

incision which was otherwise closed by sutures in layers. The wall was very thin, the patient being emaciated, with very little muscle and no fat. I intended, if I found the appendix not sufficiently dilatable, to cut its mucous membrane with a bistoury or hernia knife in such a manner that if the appendix split open it would give way in the line A, B. The result would, of course, be the performance of what might be termed an "appendicæcotomy"—i.e., an opening partly in the appendix and partly in the cæcum, but altogether outside the stitched-off peritoneal cavity, though overlapped by skin and fascia. However, the next day I had no difficulty in stretching this appendix to the size of a small rectal tube, and for three months the fæces passed through it, the intestinal obstruction, which was due to a large malignant growth obstructing the transverse colon, being completely relieved. The patient had carcinoma of the stomach with some infection of the general peritoneum (malignant nodules were seen on the peritoneum and adhesions were felt matting the parts together above, and to the left of, the umbilicus and beneath the left rib cartilages). Within 48 hours the greatly distended abdomen had emptied itself through the appendix, assisted by warm water

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MEDICAL GOLF TOURNAMENT—The annual medical golf tournament will this year be held on Thursday, May 31st, at Cassiobury Park, Watford, by kind permission of the West Herts Golf Club. The tournament will be played under the usual conditions—viz., match play of 18 holes v. Bogey—in two classes: (1) handicaps of 12 and under; (2) handicaps over 12. Foursomes will also be played for sweepstakes. Competitors must send in their names by May 30th, with lowest club handicap and 5s. entry fee, to the Honorary Secretary, Mr. Rolf Creasy, Windlesham, Surrey.

¹ Brit. Med. Jour., vol. ii., 1895, p. 863.

enemata. More recently some fæces have passed per rectum. This patient's abdomen was explored last summer and the carcinoma of the stomach was found but was too advanced for removal. A friend of mine performed a jejunostomy by Mayo Robson's method but as the patient could still take food by the mouth she allowed the jejunostomy opening to close. I reopened it on the morning of the day on which I performed the appendicostomy and she was, to a great extent, nourished by what passed between the jejunostomy and the appendicostomy. Still she took some food by the mouth, both solid and liquid, and efforts were made to keep the large intestine properly supplied with water either by the rectum or through the appendix. The nurse found it most convenient to keep both the appendicostomy and the jejunostomy tubes permanently *in situ*, as the patient complained when they were replaced. Some cutaneous irritation complicated the jejunostomy opening but none the appendicostomy. There was no excoriation whatever, such as is apt to occur with ordinary cæcal fistulæ.

This patient was, and remained, under Dr. J. A. Shaw-Mackenzie's trypsin treatment. Having regard to the advanced stage of the case she held her own in a marvellous way and she was free from pain except what was attributable to distension by ascites. Death came, from exhaustion, three and a half months after the appendicostomy. (I have mentioned that the peritoneum was found to be affected at the time of operation. In February I drew off 150 ounces of ascitic fluid.)

This is, so far as I know, the first case in which the appendix has been continuously used as a spout through which to *evacuate fæces*. It was for this purpose that I suggested that the appendix should be used at a debate on cæcal colotomy at the Medical Society of London 11 years ago.²

After Sir William H. Bennett's friendly references to my paper in his recent lecture³ I am afraid it will look ungrateful when I suggest a minor correction of his otherwise most able and suggestive remarks. Although Dr. R. W. Weir describes the appendix as presenting itself and inviting operation on the occasion of his first and now historical appendicostomy, Sir William Bennett should scarcely say that the operation was "the outcome of pure chance." I am sure he will be the first to agree that it was the outcome of Dr. Weir's surgical knowledge and insight and of his capacity for making a right decision swiftly. I have some experience which tends to support Sir William Bennett's remarks on appendicostomy as "a means of administering nourishment." It was used a good deal for that purpose during the first part of the after-treatment of the case just related and also in the case of intussusception reported by me in the paper of last August already quoted; but too much must not be expected of appendicostomy for this purpose. It is perfect for keeping the blood well supplied with water; but is any part of the large intestine of much value as an absorbing organ for the solid essentials of food? Bearing on this question are the experiments of Dr. W. H. Goddard which showed that 10 per cent. of the fat taken by the mouth is digested in the cæcum.⁴

With regard to my third case of appendicostomy (with Dr. James Crombie of Sidcup), referred to in the last paragraph of my paper of last August, although the appendix was found to be easily dilatable, it was happily not necessary to use it for the evacuating purpose for which it was partly intended, as, after copious hot water enemata with castor oil, the bowels were moved. They had not been opened for two months, the patient being in bed and under the observation of nurses all the time. When they were moved at last the motion was so large and the strain on the patient so great that the process almost resembled an act of parturition. It was feared at first that the convulsive efforts of the abdominal muscles, supported by the hands of the nurse, had torn the appendix away from the abdominal wall, but that proved to be a mistake. The appendix opening had merely retracted without breaking loose. This patient still uses her appendicostomy for injections, and, I think, occasionally for nutrient enemata.

THE DIRECT SURGICAL TREATMENT OF TYPHOID FEVER.

The most optimistic observer can scarcely deny that however skilfully it may be treated typhoid fever is a very

serious disease—serious to the community as well as to the individual, serious not only from its fatality but from the multitude of evil consequences apt to follow it. Andrew Elliot and Washbourn⁵ give the mortality in 262 South African cases as 13·7 per cent., in 15,632 "Asylums Board" cases as 18·44 per cent., in 2257 Worthing cases as 13 per cent., in the Maidstone cases of 1847 as 7·14 per cent., in Osler's Montreal cases as 11·2 per cent., and in his Baltimore series as 7·5 per cent. It is almost certain that these figures understate the death-rate. Most, if not all of them, take no account of the deaths which occur later from persistent or remote sequelæ and from undermined health or mental depression leading to serious affections which would otherwise have been escaped from. And can anyone doubt that when the medical men of a locality are hurried and worried by the overwork of an epidemic their diminished time for diagnosis and their mental prepossession leads to mild cases of diarrhoea with feverishness or even of appendicitis being mistaken for typhoid fever? When there is a really severe epidemic of influenza there is scarcely any independent disease which is not mistaken for influenza. Then, also, there are the suicides which follow typhoid fever.

As to complications and sequelæ, again quoting Elliot and Washbourn, I find that leaving out of account from 10 to 20 per cent. of relapses, hæmorrhage occurred in 6 per cent., phlebitis in 5·6 per cent., pneumonia in 3 per cent., pleurisy in 3 per cent., bronchitis occasionally, periostitis in 2·2 per cent., arthritis in 3 per cent., perforation in 2·2 per cent., cardiac complications (attributed by the authors to "previous fatigue"—i.e., before admission) in many cases, bladder trouble in 2 per cent., otitis media in 1·5 per cent., and pericarditis in 1 per cent., while there were many cases of dysentery, "tender toes," and malaria, and a few cases of abscess, gangrene, hepatitis, jaundice, and appendicitis. Of course, much of the mortality already mentioned was due to some of these complications—e.g., to the hæmorrhages and to the perforations. On the other hand, various well-known complications may occur besides those mentioned by Elliot and Washbourn—e.g., acute nephritis, pyo-nephrosis, splenic infarcts and abscesses, orchitis, neuritis, multiple neuritis and spinal troubles. And there is one danger to which I have never yet seen any reference but which is indubitable—viz., that of permanent injury to the ovaries and tubes due to pelvic complications. A girl, aged 11 years, while under treatment for typhoid fever developed peritonitis (probably due to perforation), resulting in suppurative peritonitis which involved the pelvis and both flanks. After operation and thorough drainage she recovered. This was 20 years ago. While still in her "teens" she married but though apparently in robust health she remained childless.

It is well known that the appendix vermiformis is occasionally affected in typhoid fever and that the appendix and the right uterine appendage are sometimes inflamed together.

To realise the seriousness of at least the surgical complications and sequelæ of typhoid fever it is necessary to be acquainted with them practically. A patient had multiple typhoid "abscesses," or at least foci of softening and pathological change in both tibias. The medulla of the two bones was more or less destroyed. After months of treatment he recovered and returned to his occupation as an actor, only to fracture one of these weakened bones the first time he tried to dance. The term "typhoid periostitis" conveys but a faint idea of what this poor fellow had to go through. And complications are liable to occur at long periods, even years, after the fever, so that the connexion is not always suspected.

Numbers of officers and men were more or less incapacitated for months or even years by post-typhoid phlebitis after the South African war. A friend who was a civil surgeon at one of the Aldershot hospitals during the war says that the suicides which followed typhoid fever contracted in that war were numerous. Men came home convalescent but depressed. One of my two resident dressers when I was a house surgeon afterwards contracted typhoid fever in India and shot himself dead while still depressed and weak.

As for complications of acknowledged gravity—e.g., perforation and hæmorrhage—I have had the opportunity of operating on three, perhaps I should say four, cases. One patient was a middle-aged lady with perforation. The hole

² THE LANCET, Nov. 17th, 1894, p. 1155.

³ THE LANCET, Feb. 17th, 1906, p. 419.

⁴ Chelsea Clinical Society, THE LANCET, March 25th, 1905, p. 795.

⁵ THE LANCET, Jan. 18th, 1902, p. 139.

in the intestine was found at once and was closed with ease. The intestines were, however, adherent, inclosing various collections of pus and covered with lymph. The perforation was several days old. The peritoneal cavity was washed out with warm water (neutral saline solution had not been introduced as a douche in those days) and drainage was used. The patient was relieved of pain but she died within 24 hours. The typhoid fever had been diagnosed by the late Dr. J. S. Bristowe and Dr. Crombie, the perforation by the latter. This was the first case of perforating typhoid ulcer diagnosed before operation and operated on in these islands. It was on June 5th, 1888. Up to and after that date no such case had been successful anywhere. The case was not taken in time. Von Miculicz's solitary successful case was not diagnosed till after operation. The late Mr. Bartleet's attempt to operate on a typhoid perforation had been made, but the surgeon failed to find it.⁶ In foreign countries Bontecue, Lücke, and Morton had each operated on a case in 1887, but without success. I have referred to the girl whose symptoms were subacute and who recovered. A third case was also a case under the care of Dr. Crombie. A middle-aged woman with severe typhoid fever and much exhausted (temperature 106° F.) showed signs of perforation and was operated upon on the next day. The last half-yard of the ileum contained the perforation and was so intensely congested and inflamed that I excised it. The patient died on the next day. At about the same time a patient was taken into hospital under my care but was operated upon by my assistant surgeon. The perforation was only a few hours old. The patient appeared to be doing well but on the following day she died from acute hæmorrhage. Excision of the lower end of the ileum would probably have saved this patient by removing the ulcer which afterwards bled; and, on the other hand, I did too much to my exhausted patient when I performed enterectomy. A simple suture of the perforation would have given her a better chance, though but a small one.

The question has for some years presented itself to my mind—Ought not typhoid fever patients to be operated on before fatal perforation and bleeding occur? Most of the typhoid ulcers occur within a yard of the ileo-cæcal valve. It is true that the typhoid bacilli are in the lymphatics of the intestine, in the glands, and occasionally in the blood, but gonococci penetrate the tissues deeply and yet are reached and killed by silver salts such as argyrol. Really no weighty argument can be urged against the local treatment of typhoid intestinal ulcerations except their comparative inaccessibility. How can they be made accessible? There are several ways. 1. In a certain proportion of cases the ileo-cæcal valve does not prevent large enemata—e.g., four or five pints—from entering the small intestine, and even passing upwards right through it. But this proportion is very small. The patient would possibly have to be placed on his hands and knees—a position exhausting or even impossible to many typhoid cases and probably few such patients could stand its frequent repetition. 2. With a laparotomy the ileum could be opened a yard above the ileo-cæcal valve. Two principal techniques are available: (1) resembling that of a sigmoid colotomy and (2) resembling that of a Witzel's gastrostomy. With the former the last yard of the ileum and the whole of the large intestine could be placed at rest, no faeces passing through, but only the warm weak saline or silver solutions prescribed by the physician. With the latter much, if not all, the faeces would still pass on to the rectum and natural anus. Medication would be easy, but rest would not be secured. The first technique would be the quicker to do, while the anatomical result of the second technique would be simpler to undo when the patient had recovered. But resection of a portion of small intestine for the purpose of closing such an enterostomy opening as this which we are discussing should, in competent hands, be a very safe procedure, because (a) it would be of *small* intestine, not large, and (b) there would be no embarrassing adhesions such as often complicate faecal fistulæ which have been caused by tubercle, by appendicitis, or by other diseases attended by peritonitis. 3. With an appendicostomy the surgeon would put himself and his colleagues in a position to wash out and to empty the whole large intestine with ease. By sufficiently dilating the appendix, not usually a difficult task, egress could be given for the unhealthy faeces before they had passed on beyond the cæcum. Further, as the appendix opens into the

cæcum only from one to two inches below the ileo-cæcal valve, and as the exact relation and distance of the two could be noted precisely at the time of performing the appendicostomy, the passage of a catheter into the small intestine through the ileo-cæcal valve is not difficult. It is not its difficulty but its questionable advisability that might prevent one from resorting to this manœuvre. Owing to the fact that there might be an ulcer on the point of perforating certain precautions would be necessary. I would suggest the following. 1. Careful inspection, if possible, of the lower end of the ileum at the time of operation. Great gentleness would be advisable. 2. The use of a glass catheter. When this passed through the ileo-cæcal valve it would probably be gripped and after a time fluid faeces would rise in it to a certain level, indicating a pressure beyond which it would not be perfectly safe to go far in washing out the ileum through the catheter. It would be better to wash out with a funnel than with a syringe. If necessary the appendicostomy could, of course, be used to feed with water or with digested, or semi-digested, milk, &c. I think the chief value of appendicostomy in typhoid fever would be to keep the whole large intestine well and frequently washed clear of faeces polluted with discharges from ulcerations and to substitute for these discharges abundance of water or neutral saline solution.

There is one consideration which points to enterostomy as preferable to appendicostomy, unless it can be demonstrated as comparatively safe and practicable not only to pass a wide catheter or drain through the appendix and the ileo-cæcal valve but to *keep* it there, so as to remove all internal pressure from the lower end of the ileum. It is possible that, as has been also suggested by Box and Eccles, it is the stasis of infected faeces by the ileo-cæcal valve which is the cause of so much typhoid ulceration occurring in the coils just above it. This is an indication for enterostomy, and the position for that operation is about a yard above the ileo-cæcal valve. The distal and the proximal openings should be well separated by some such means as that which Bidwell recommends for sigmoid colotomy—viz., suturing the lips of the middle of the parietal wound together through a hole in the mesentery.

I have been for two years endeavouring to get from some of my medical colleagues the opportunity of applying the above considerations to a case of typhoid fever. I have been invited to see one or two but they seemed to be doing so well while I kept them under observation that in those particular cases I did not feel justified in doing otherwise than let well alone. I should naturally have preferred to operate first and write afterwards but did not feel that my paper on appendicostomy read at Leicester in July, 1905, would be complete without stating that "appendicostomy has a conceivable value in the treatment of typhoid."⁷ Sir William Bennett returns to the subject in his recent lectures.⁸ He tells us that Dr. W. Ewart is extremely anxious to utilise appendicostomy in the treatment of typhoid fever and finds little or no difficulty in introducing an instrument through the ileo-cæcal valve by means of an appendicostomy. This carries us a step further.

The operative treatment of typhoid fever ought not to mean taking this disease out of the physician's domain and transferring it to the surgeon's. It is a means of facilitating treatment by the physician. If an enterostomy be done the task of restoring the continuity of the intestine after the enterostomy is no longer wanted should be entrusted to an experienced abdominal surgeon. Even appendicostomy, although one of the easiest of operations when the patient is of normal, average, and healthy anatomy, may be neither easy nor safe if performed rashly on a different subject—e.g., on a fat person with the appendix the seat of old inflammation, surrounded by tough adhesions, and stretching up behind the cæcum. Ultimately I believe that when the services of a practical abdominal surgeon are obtainable enterostomy rather than appendicostomy will be the operation preferred. Enterostomy raises the question of the comparative danger to other people, and especially to nurses, of typhoid stools passed through enterostomy openings and those passed per anum. Through the enterostomy all stools would be liquid and would be passed without the patient's control, but if large wood-wool pads were used and they and the cleaning swabs were handled with forceps, as they ought to be, cleaning the

⁶ Medical News, 1887, vol. ii.

⁷ Brit. Med. Jour., vol. ii., 1905, p. 864.

⁸ THE LANCET, Feb. 17th, 1906, p. 420.

abdomen, the right flank, and the groin would be easier than cleaning the buttocks and perineum of an apathetic typhoid patient with diarrhoea.

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SOME POINTS IN THE TREATMENT OF CHRONIC BRIGHT'S DISEASE.¹

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UNDER the term "chronic Bright's disease," as commonly understood, are included two different affections—viz., chronic parenchymatous inflammation or the later stage of acute nephritis and granular kidney. They stand in marked contrast with one another and, so far as treatment is concerned, must be dealt with separately. The questions that I shall deal with will be chiefly those upon which opinions are undecided or at variance.

CHRONIC PARENCHYMATOUS NEPHRITIS.

In chronic parenchymatous inflammation we have to do generally not with a slowly progressing—i.e., still active—process but with the results of an inflammation previously acute but not any longer active. As the stages pass gradually into one another, and it is impossible to say exactly where the acute stage ends and the chronic stage begins, so the treatment of acute nephritis gradually merges in that of chronic, and the first question which arises is: When and in what way the treatment of the acute stage may be modified, its restrictions relaxed, and the treatment of convalescence be commenced? In acute nephritis the circulation in the kidney is disordered, the cells disorganised, and the tubules obstructed by disintegrated cells and exudation. The treatment at this stage is to relieve the kidney of work by modifying the diet, keeping the skin and bowels active, and avoiding all renal irritation. In the later or so-called chronic, or post-nephritic, stage the circulation has more or less recovered itself except so far as there is the hyperæmia which is necessary for active cell growth. The obstruction to the tubules is relieved and new cells are actively growing to take the place of those which the inflammation has rendered useless. This cell growth is the chief phenomenon of convalescence. For healthy cell growth the body must be in a good state of nutrition and the delicate young cells formed must be nursed and protected until they are seasoned and robust. The problems, then, of convalescence are to promote the growth of healthy cells, to avoid all fresh irritation, and to relieve the weak and delicate organ.

One of the first signs of improvement is the disappearance of oedema. In the early stages when the inflammation is active the oedema is universal and probably of toxic origin, but in the later stages it is often cardiac—i.e., due to weak circulation. Iron is often said to be of no use in the treatment of the anæmia of renal disease. For renal cachexia—i.e., for toxæmic anæmia—it is practically useless, but not for the post-nephritic anæmia, for which condition it is one of the most useful general tonics that can be employed. Another sign of improvement is the disappearance of the high tension of the acute stage. The pendulum often swings the other way and the tension falls much below normal. For this tonic and stimulants are necessary and probably the use of such drugs as digitalis, strychnine, and adrenalin.

The more the functions of the kidney are impaired the more actively must the complementary organs be worked—viz., the skin and bowels. Conversely, as the kidneys regain their functional powers, the less active need this complementary treatment be. So active diaphoresis, bathing, and purgation become unnecessary; more than that, these methods are all lowering and depressing and, therefore, when the acute stage of the disease is past they are contra-indicated. All that is necessary is that the skin should be kept gently acting, the bowels gently moved, a Turkish bath ordered once or twice a week, or a hot bath on going to bed. The milder purges are sufficient, such as salines or rhubarb and aloes, but mercurials are now best avoided. The gradual reduction in the amount of albumin in the urine is

rightly regarded as the best indication of the progress of the disease towards recovery and when albumin is permanently absent the case may be regarded as cured.

Albuminuria is really a symptom and an indication, but it is often regarded and treated as a disease in itself. The significance of albuminuria depends upon its relation to other conditions of the urine—e.g., the quantity, the specific gravity, the amount of urea, &c. If these be normal the presence of some albuminuria is of little importance. The filtration of albumin from the vessels into the renal tubule is prevented by the cells. If the tube contain no cells or the cells be not normal, albumin will filter through. Recovery from acute nephritis is therefore largely a question of the growth of cells. The old ones have to be removed and new ones produced. The kidney cells are highly specialised and therefore are very slowly regenerated. When grown they take still longer to get seasoned and resistant so that the kidney will be delicate for some time and will not stand overwork or irritation. The problem, then, in convalescence from renal disease is how to get the cells well grown and seasoned.

The first important question in the treatment of chronic parenchymatous nephritis is that of diet. When and in what way may that be improved? Patients are often kept upon a milk diet so long as albumin is present in the urine. Milk is a good enough diet for little children and in acute disease adults have to be treated like little children. Yet for both alike in time the diet must be strengthened. For if kept on milk alone the nutrition suffers, the tissues become flabby and soft, and though life may be maintained for a long time on milk alone, especially if supplemented by starchy food, still the body is not vigorous and the general tone is poor. Fortunately, adults get so tired of milk alone that they often take the matter into their own hands and modify the diet for themselves. The benefit of change of diet in chronic parenchymatous nephritis is a matter of daily experience. Their condition often remains stationary till a more liberal diet is given and then improvement is rapid.

There are certain articles that should be avoided in all cases of kidney disease. One is alcohol in all forms, another is meat extracts, whether in the form of soup or broths, or of the much advertised and popular extracts of meat; so also fruits and vegetables which are rich in irritating salts—e.g., tomatoes, asparagus, gooseberries—and for a similar reason salted and preserved meats. Why eggs are taboo I cannot understand, for they are composed of a very easily assimilated form of albumin and are an excellent supplement to milk. Nor can I see any reason for the prejudice which exists against red as distinguished from white meats unless it be that some patients may find the one more easy of digestion than the other. Red meats contain no more extractives than white. In both cases boiled meats are better to begin with than roast, as in boiling some of the extractives are dissolved away. The patients often crave for a little red meat and I do not know any good reason for refusing them their wish.

The next practical question that arises is when may a patient leave bed and get about. The risk of getting up is that of catching cold and every precaution must be taken to avoid this. The difficulty of doing this with children is often so great that bed is regarded as the safest place. So it might be with a careless adult. But prolonged confinement to bed affects the health injuriously, though children bear it better than adults. The change from a recumbent to the erect position is very likely to be accompanied at first by an increase in the amount of the albumin which, however, may slowly decrease again as the body accommodates itself to the altered conditions. Fresh air is a very important factor in the treatment of the convalescent stage, though it is often not thought of, and the patient is confined to one room which is kept too warm and not sufficiently ventilated. Even if the patients are in bed the windows may be open and as much fresh air given as possible provided there be no draught. In suitable weather kidney cases may even be carried in the bed out of doors and lie all day in the sun. The open-air cure of nephritis is as important and advantageous as it is in many other forms of inflammation, provided draught and exposure be avoided.

The drug treatment of chronic parenchymatous nephritis is that of convalescence from any severe disease and will be modified only so far as the organ attacked, in this case the kidneys, requires.

GRANULAR KIDNEY.

In granular kidney the problems are different. Here we

¹ A paper read before the Medical Society of London on Feb. 26th, 1906.