quently performed under the most adverse conditions, the patient never having recovered entirely from the exhaustion which followed upon the use of the apparatus.

TREATMENT.

In considering the treatment of the condition now under discussion, the following points—which may, I suppose, be considered to be elementary—must be held in view. For clinical purposes gastric dilatation, to whatever cause it may be due, consists of three stages.

The first stage is that of irritation. Any hollow organ the contents of which meet with resistance in their escape becomes in the first instance irritable; it, in fact, resents the obstruction to the performance of its natural functions. The result of this irritability is pain, occurring at first only when the functions of the organ are most active, that is to say, in the case of the stomach immediately after taking food. At this stage, then, the symptoms of commencing gastric dilatation are merely those of irritative dyspepsia.

With the increase of the dilatation comes the second stage, in which one of two conditions follow, that is, either a state of tolerance in which, although the viscus may contain a great quantity of material, the patient, beyond a sensation of general abdominal fulness and distate for food, complains of nothing, or a condition in which the dilatation is associated with continual pain under the liver, which becomes intensified after taking food. As digestion proceeds or not, as the case may be, the pain may subside or become more intense; in the latter case vomiting follows, the ejected material consisting for the most part of imperfectly-digested food.

The third stage is that of advanced dilatation with recurrent irritability, the result of fermentation of the stomach contents which produces periodical vomiting of sour offensive material in great quantity.

The first of these three stages from the nature of things suggests nothing in the direction of surgical interference, since the symptoms are those of dyspepsia only. In the second stage, however, the question of surgical treatment becomes important, and in this connection the cases may be usefully divided into two categories, (a) those in which the symptoms amount to mere discomfort, and (b) those in which there is acute pain mainly in the sub-hepatic region which is increased by the taking of food.

In the cases coming under the first of these classes there is no doubt that discriminating medical treatment, especially the administration of antispasmodics, notably the almost forgotten sumbul of one's student days, combined with stomach lavage and abdominal massage, can do much for the comfort of the patient, although a cure may not be thus effected. In the painful cases on the other hand, I have no doubt that surgical measures are directly indicated in the form of an exploratory abdominal section, it having, of course, been previously ascertained by careful examination that no hernia or other abnormal condition about the parietes exists which may possibly exercise a harmful effect upon the function of the stomach. The number of cases, of the kind now in view, which cannot be permanently relieved if they are not actually cured by proper surgical measures must, I am sure, be very small.

In respect to surgical interference in cases of gastric dilatation generally, a point which cannot be too strongly emphasised is this—to effect the greatest benefit the treatment should be undertaken before the dilatation has been followed by organic changes—such as atrophy, for example—in the walls of the organ, which may and probably have so impaired its functional power that a return to a normal condition would be impossible, even if the mischief which originally led to the dilatation were rectified or removed.

In other words, it is most important in this, as in other conditions, that the surgical treatment should not be delayed too long. It is quite clear that in the third stage of the complaint, as described in this lecture, the chances of a cure in the true sense must be comparatively small. Such cases may fairly be left to be managed by lavage and massage, unless such a line of treatment fails to make life tolerable in which case surgical interference is clearly indicated.

With regard to the actual surgical proceeding in dealing with cases of dilatation, the first essential is to ascertain whether there is any abnormal condition about the parietes,

such, for example, as the small umbilical hernia to which I have before referred, which may exert a harmful effect upon the stomach. The possible existence of movable kidney and other abnormal intra-abdominal conditions should be borne in mind. The examination necessary for the investigation of the belly from this point of view being made preferably under an anæsthetic. Any abnormal condition, outside the stomach itself, must in fact be first dealt with when it exists.

Failing the discovery of any abnormal condition like those just mentioned, the causes of the dilatation may be fairly assumed to be in the stomach itself or to immediately involve its external surface in the form of adhesions or something of that kind. An obvious tumour apparently connected with the stomach may or may not exist. Under any circumstances the only surgical measure at this stage is an exploratory laparotomy; should this reveal a growth, it must be dealt with by removal or not, as the circumstances of the case indicate, the alternative being gastro-enterostomy.

Should there be pyloric thickening, pyloroplasty is probably the best measure to adopt. Adhesions of the stomach to surrounding parts must of course be divided.

So far I have said nothing concerning the surgical measures which is not perfectly obvious. I now come to the class of case to which I wish in conclusion to especially call your attention. In a considerable percentage of cases of gastric dilatation in which exploratory abdominal section has been performed no evidence of obstruction of any kind can be made out by manipulating the organ from its external surface, yet in many of these I have reason to know (an example is quoted at the commencement of this lecture) pyloric obstruction, sometimes to an extreme degree, exists and is remediable. In all cases, therefore, after abdominal section for dilatation of the stomach, the viscus should be opened on the cardiac side of the pylorus, even if previous manipulation has failed to detect any sign of thickening or other abnormality, in order that the condition of the pyloric sphincter may be examined.

If upon examination in this manner any contraction of the lumen of the pylorus is found, the sphincter should be forcibly stretched until it will allow two or three fingers to lie loosely in it. Such a measure is, I believe, curative in the true sense, but, as I have already said, it should be adopted not as a last resource, but before the stomach walls have undergone degenerative changes which may render their return to a healthy state impossible.

NOTE.

¹ This patient has recently been readmitted into the hospital and is now under observation. There is no sign of gastric dilatation; continued soreness is, however, felt after taking solid food. No tumour can be felt but the growth is probably recurring.

TWO CASES OF COLECTOMY.*

By F. T. PAUL, F.R.C.S.,
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IN 1895 I read a paper on colectomy at this Society, which was published in the BRITISH MEDICAL JOURNAL, p. 519. It described the 7 cases on which at that time I had operated, and, based upon an experience of those cases, an operation involving the establishment of a temporary or permanent artificial anus was recommended to be usually done in preference to any of the various methods in vogue for immediately restoring the continuity of the bowel. The operation designed was only employed in the 6th and 7th cases, and though successful for the time being in both, the early recurrence in the 6th case, and the onset of uræmia in the 7th due to chronic Bright's disease, prevented these patients from reaping the benefit they might otherwise have obtained.

The operation is performed as follows: The site of the stricture having been located, a sufficiently free incision is made over it, and the bowel exposed. The mesentery is then divided well beyond the growth on each side, after first clamping or ligaturing all the vessels contained in it, when the loose piece of bowel including the tumour will readily hang out of the abdominal wound, the mesentery is now sewn together in the opposite direction, leaving the cut stump on the under side, and the sutures are continued in the

* Read at the Liverpool Medical Institution.

outer coats of the upper and lower portions of the freed bowel in such a manner as to cause them to lie in contact for not less than 3 inches, like the two barrels of a double-barrelled gun (see Fig.). Small incisions are next made in the gut

above and below the growth. Through the upper a large glass colotomy tube is introduced and ligatured, and through the lower a small tube. Finally, the loop of bowel containing the tumour is cut away, a proceeding which is, of course, quite bloodless, owing to the division of the mesentery and the ligatures round the bowel. It is not necessary to suture the bowel to the wound, and I never do so; but if the wound is at all longer than is required to accommodate the two cut ends, part of it should be closed with fishing-gut sutures passed through all the layers of the abdominal wall. It will be seen that in this way all stages of the operation after opening the peritoneal cavity are bloodless, and that there is not the slightest risk of fouling the peritoneum with faecal matter; hence when the growth is small this operation is really very little more serious than an ordinary colotomy, whilst the benefit accruing to the patient is considerable.

The tubes remain in usually from seven to ten days, and as soon as the wound is clean after their separation long dressing forceps are introduced in all suitable cases after the manner of Dupuytren's enterotome, and the handles fastened together with fine rubber tubing. In a few days the forceps will have cut through the spur for the full depth they were introduced, say 2½ inches, and the lumen of the bowel is restored. When this has been successfully accomplished the artificial anus is easily closed by separating the mucous membrane and turning it in with Lambert sutures, and then bringing together the skin edges above it.

Since publishing the paper referred to I have only met with two cases in which the operation described was feasible, and in only one of these was it desirable to attempt restoration of the continuity of the bowel. For the first case I am indebted to my friend Dr. Charles Barlow, of Prescott, who called me one day in July, 1898, to relieve an old man of 66, who was in an urgent condition from intestinal obstruction. The patient was well nourished and of the hale constitution and firm character so frequently met with in the rural districts of Lancashire. For some months past he had suffered from gradually increasing constipation, which had culminated in

absolute obstruction a week previously. Dr. Barlow had tried various remedies without effect, and it was only at the last moment that the patient, recognising his hopeless condition, consented to have an operation done. The abdominal distension was now excessive, the vomiting becoming faecal, and his strength failing rapidly. As the whole of the large intestine appeared to be distended, and as he could not retain a larger injection than half a pint, and other minor details pointed in the same direction, I concluded he had a malignant stricture of the sigmoid flexure. Owing to the extreme distension of the abdomen, it would have been necessary to introduce the entire hand through an incision in the middle line, if one decided to explore there first with the object of localising the stricture, and as such a proceeding would add much to the gravity of the operation in his then condition, it was decided to abide by the diagnosis, and make the incision over the sigmoid flexure. Dr. Barlow gave the anaesthetic, and with the only assistance available, that of the man's son—another specimen of the hard Lancashire constitution—I cut down in the left iliac region, and with considerable difficulty drew into the wound a malignant growth in the sigmoid flexure. The mesentery was of the shortest variety, so that it was quite impossible to prepare the bowel for subsequently cutting down the spur; I therefore contented myself with putting in the tubes, and excising sufficient bowel to be well clear of the growth. A very large quantity of motion flowed away during the first twenty-four hours, and his condition at once improved. The tubes separated on the tenth and eleventh days respectively, and his subsequent recovery was uneventful. Since the operation he has remained in excellent health, except that, as is usual in colotomies when the mesentery is very short, there has been a great tendency for the bowel to drag in, and for the orifice to contract. Of course I do not propose to do more than keep the opening patent in such a case as this; in fact, a man of 66 who enjoys full health and vigour a year and a half after colectomy, and with nothing worse to complain of than a tight artificial anus, is much to be congratulated.

The second case is more recent, and at present is more successful; but I am doubtful of the ultimate issue as the growth was larger, some glands were involved, and the patient was younger; all conditions suggesting a higher degree of malignancy.

The patient, a woman aged 45, was admitted into the Shaw Street Hospital for Women, under the care of Dr. Briggs, on June 6th, 1899. He successfully performed ovariectomy upon her, removing a dermoid tumour, and, when doing the operation, discovered a malignant growth in the sigmoid flexure. He decided it would be better not to complicate the ovariectomy by so serious an addition as a colectomy at the same time, and had her carefully removed to my wards at the Royal Infirmary on June 23rd, a fortnight after the ovariectomy. I at once arranged to excise the tumour, and operated on June 26th, Dr. Briggs being present. The growth, though freely movable when previously seen, was now fixed by recent adhesions, and was much larger than it had appeared a fortnight before, whilst in the mesentery there were unfortunately several small malignant glands. The operation was conducted exactly on the lines described, and no special difficulties were encountered. She recovered rapidly and well, the highest temperature recorded being 99.5°. The dates of the different stages were as follows:

June 26th. Bowel and glands excised.

July 4th. Both tubes removed.

July 11th. Spur compressed with forceps, which came away on the 17th.

July 18th. Motions passed *per anum*, and, on examining the artificial anus, the spur was found to be entirely removed almost to the depth that the finger could reach.

July 20th. Artificial anus closed, and all motion in future passed naturally.

Thus from the excision of the bowel to the restoration of the natural passage an interval of only twenty-four days elapsed. Subsequently the patient gained strength, and was discharged on August 18th. Since returning to her place, she has had a tendency for the wall of the colon to herniate through the wound, so it is supported by a belt and pad. I do not know that it could protrude to the extent of doing any great harm, but it might be as well in future cases to try and bring together the muscles as well as the skin over the bowel when closing the artificial anus.

In contrasting this operation with, for instance, any button or tube method, there is, I think, little that could be urged against it except that its different stages might be expected to occupy more time and prolong convalescence. Here, however, is a case showing such a view to be unfounded, for all the stages were completed in a little over three weeks. Button operations are no quicker than this, whilst any form of intraperitoneal approximation must of necessity be more dangerous to life than an operation in which the ends of the bowel are brought outside, and which by a sufficient experience has been shown to be not much more serious than an ordinary colotomy.

In regard to the present condition of these two patients, Dr. Barlow reports that Mr. S., who is now bordering on 68, "is very well; he is in good flesh, and has a healthy look." Dr. Briggs's patient is here, and you can judge for yourselves as to the condition of her general health and comfort. She will tell you that she has no trouble whatever with her bowels, an assurance one is glad to get, because one naturally had a slight fear that when continuity was restored in this way the calibre might not remain of the normal dimensions.

A CASE OF GASTROSTOMY TREATED BY FRANCK'S METHOD.

By COLIN MACVICAR, M.A., M.B., C.M. EDIN.,
Late Demonstrator of Anatomy in University College, Dundee.

A NUMBER of new operations for gastrostomy have been introduced since 1886; the more important of these are Witzel's,¹ introduced in 1891, Franck's² in 1893, Kader's³ in 1896, and Marwedel's⁴ in 1896.

The primary object sought after is to prevent leakage, which was the outstanding objection to the old operation of making an incision in the abdominal wall, suturing the stomach to the wound, and after a few days opening it. The irritation of

the skin by acid gastric fluids was usually so great that the patient was glad when the end came. The methods of Witzel and Kader are probably more suitable for cicatricial cases

where one desires a temporary fistula, as the opening soon closes on withdrawal of the tube.

The methods of Franck and Marwedel are probably better for malignant cases where a permanent fistula is desired, and where the tube may be removed easily after each meal.

In Witzel's method the insertion of the tube when once removed is said to be sometimes accomplished only with great difficulty, and is usually allowed to remain in. The least complicated method is that of Marwedel, which on occasion has been performed under cocaine anaesthesia, and this, no doubt, is an advantage, as in exhausted cases septic pneumonia usually supervenes after the exhibition of chloroform. The methods of Witzel and Franck are only practicable where little or no cicatricial contraction of the stomach exists.

In the case to be described, in which Franck's method was adopted, there was no contraction at the time of the operation, but in my opinion considerable secondary contraction from the invasion of the cardiac end of stomach with growth took place, and from the traction considerable pain resulted, so that to her at least the operation was a questionable gain. For malignant cases, therefore, where the tumour in the oesophagus is placed close to the cardiac portion of the stomach, Marwedel's operation will probably give more satisfactory results than Franck's. My patient lived four months after the operation, two or three months longer than the average expectation in malignant cases.

Very few complete records of cases of gastrostomy are to be found in medical literature, and this case presents several interesting features.

The patient, aged 63, consulted me in June, 1898. She was one of a large family; three brothers being dead, one of whom died at the age of 53 from cancer of the stomach. Of her own family, eleven in number, four died in infancy, and the others enjoy good health. The patient two years previously nursed a man who died with cancer of the larynx; it was her opinion this had something to do with her own disease.

Till fifteen months previously she led an active and hard life, often being engaged as a midwife in her native village. At that time, however, she began to experience some difficulty in swallowing, and since May, 1898, she could only swallow semi-solid food and fluids. In January of the same year she began to complain of pain in swallowing over the lower end of the sternum. Pain under the left breast had been a fairly constant symptom. She had lost flesh rapidly, and had no appetite for food for three months before coming to me. I prescribed $\frac{1}{4}$ grain doses of opium and belladonna to be taken for the pain, but had afterwards to increase the dose of opium to $\frac{1}{2}$ grain before she became at all comfortable.

On her next visit I passed a soft rubber stomach tube gently, which was stopped immediately above the cardiac end of the stomach; with gentle but steady pressure it was passed into the stomach, but during its passage she complained of great pain. The point of the tube on withdrawal showed some streaks of blood and some colloid material. There was no suspicion of syphilis. She took alcoholic stimulants, but not to excess.

The operation, after the method of Franck, was performed on August 5th, 1898. An oblique incision about 2 inches long was made below the left costal margin, and after blunt dissection of the muscles the peritoneum was incised and a cone of healthy stomach, $\frac{1}{2}$ inch long, was drawn in the wound, its base being fixed to the parietal peritoneum by means of catgut. A second incision, $\frac{1}{2}$ inch long, was made about 1 inch above the first, and the bridge of the skin between the two incisions bluntly undermined, and the drawn-out portion of stomach was passed under the skin and out at the wound above, and fixed there by two or three catgut sutures. The first wound was closed with silkworm gut. After opening the stomach I syringed into it 3ij of a mixture of brandy and raw egg. On her recovery from chloroform there was no shock. The tube was left in for three days, and during that time she was fed thrice daily with milk and raw eggs, and was occasionally given whisky. She was in good condition, with no rise of temperature, but as sickness and retching were persistent I decided on the third day to inspect the wound. The dressing was soiled with stomach contents, which had leaked out along the side of the tube, doubtless while retching. The wound, however, looked well. A new dressing was applied, and the tube removed. Thereafter till the tenth day she was fed by the mouth. On the fifth day a localised peritonitis set in with a temperature of 101° , which, however, fell to normal on the ninth day.

After the third day I dressed the wound daily as there was always some, though a diminishing, amount of leakage on each occasion. The stitches were removed on the ninth day. The wound had healed by first intention. Feeding was renewed by the tube, at first by a quarter inch tube and afterwards by one the thickness of an ordinary stomach tube. Her diet consisted of thin porridge, milk, eggs, beef tea, and soups. No leakage occurred when she coughed or retched, but on withdrawal of the tube there was a certain amount of overflow. Four meals were given daily, and after each the tube was removed.

All went well. She put on flesh, and pain (which was before the operation a marked feature in the case) was completely absent, due probably to the rest ensuing from doing away with the act of swallowing. At the end of a month Dr. Mowat kindly photographed her, and the photograph is here reproduced.

From this time onwards she complained of pain, at first slight, and only during the passage of the tube, but later also when the stomach received a full meal. I tried a 10 per cent cocaine ointment, a small amount being applied to the opening a quarter of an hour previous to a meal, but her pain seemed as great as before.

Frequent lavage of the stomach with a weak solution of common salt