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A Lecture ON JEJUNAL AND GASTRO-JEJUNAL ULCERS.

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BY

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GENTLEMEN.—I have selected this subject for three reasons—first, because I have had considerable experience of jejunal and gastro-jejunal ulcers; secondly, because I consider that the disease occurs much more frequently as a sequel of gastro-enterostomy than the profession is quite willing to acknowledge; and, thirdly, because I have certain suggestions to make both with regard to prevention and treatment.

My operative experience extends to seven cases, some of which have followed operations that I have myself performed, and others have followed on operations performed by eminent surgeons, whose technique, according to our present ideas, is beyond reproach.

Gastro-enterostomy—an operation which can be performed with an operative risk of 1 or under 1 per cent.—is one of the most useful in surgery, when performed on suitable cases. But the fact that certain methods or refinements of technique afford safeguards against nearly all the dangers of the operation, does not of necessity show that unfavourable sequelae may not arise in some other way, and that the dangers, which do not make their appearance until many months, or it may be years, after the original operation, may possibly be greater than ordinarily recognized, and very serious in their results. I think the time has arrived for a reconsideration of the operation of gastro-enterostomy, of the class of cases in which it is justifiable to perform it, and of whether or not one can suggest a better way in some cases of giving the stomach and duodenum absolute rest until ulcers or other disease may have healed or been remedied.

Only recently, sepsis was the most serious factor to be contended with, after which followed the fear of shock and haemorrhage, to say nothing of the dangers of starvation from fear of feeding, and failure of union in the anastomosed viscera.

Practically the whole of these dangers have been overcome by improved technique, but the serious complications that have not yet been successfully combated are jejunal and gastro-jejunal ulcers—the former being wholly in the jejunum, the latter at the margin of the anastomotic opening. I am able to show specimens of both of these types of ulcer.

The etiology of ulcers of the type which have hitherto, rightly or wrongly, been termed peptic ulcer, is extremely interesting, and has given rise to much speculation and to many theories.

In the stomach ulcer is extremely common, in the duodenum equally so, and certainly much more frequent

than hitherto has been supposed, but in the jejunum it has been generally thought to be very rare. Probably it never occurs in the jejunum except as a complication of the operation of gastro-enterostomy.

Braun, I believe, first described the occurrence of such an ulcer in the jejunum of man, and since that time the subject has received attention at the hands of Hahn, Kausch, Körte, Kocher, Mayo, Paterson, myself, and others. In 1903 I prepared a paper on the subject which was published in vol. lxxxvii of the *Medico-Chirurgical Transactions*. It contained, I believed at the time, the first case described in English literature. I was then able to collect 16 cases from various sources, but many have since been reported by other surgeons. In Mr. Paterson's paper he referred to 2 of his own and to 61 recorded cases.

Dr. W. J. Mayo believes that the greater part of, if not all, gastro-jejunal ulcers are due to failures in technique in the operation of gastro-enterostomy, whereas true jejunal ulcers seem to be unavoidable. In the Rochester clinic, out of 1,141 gastro-enterostomies, so far as could be ascertained, there had been no case of pure jejunal ulcer, though there had been an operative experience of three gastro-jejunal ulcers—one the result of an impacted Murphy button, occurring three years and nine months after operation, the button having been retained in the stomach. The ulcer in this case was excised, and another operation performed over a Mayo-Robson bone bobbin, the patient making a good recovery. The second case was the result of retention of an infected suture, and occurred seven months after operation. The ulcer was excised, and another gastro-enterostomy performed, the patient making a good recovery. The third case was the result of an infected haematoma in the suture line. The whole opening, including the ulcer, was excised two and a half years later and a Finney's operation performed.

It would seem, from a study of reported cases, that no type of gastro-enterostomy renders the patient immune from this form of ulcer, since it has occurred after anterior gastro-enterostomy, after posterior gastro-enterostomy with a loop, both with and without lateral anastomosis, after posterior gastro-enterostomy without a loop, after Roux's operation, as well as after the use of the Murphy button and my decalcified bone bobbin, and after the employment of simple sutures.

As to the cause, some interesting experiments were performed by Mr. Paterson, and described in a paper he read before the Royal Society of Medicine in June, 1909. His observations seem to confirm what had previously been suspected—that the cause of jejunal ulcer after gastro-enterostomy was due to excessive acidity of the gastric juice.

I had previously expressed an opinion, which I still hold, that sufficient care is not exercised in dieting patients who have undergone the operation of gastro-enterostomy, and that hyperchlorhydria and sepsis combine to produce ulceration; in fact, the cause of this form of ulcer is exactly the same as that of duodenal and gastric ulcers.

In order to prevent this complication it has seemed to me that absorbable material should only be used for the marginal suture, but, even where chromic catgut only has been used, the disease has sometimes followed. A modification of its application may therefore be advisable, only fine catgut being applied as a marginal suture to

appose but not constrict the mucous margins, and two lines of sutures, serous and sero-muscular, employed to unite the outer and middle coats of the viscera.

The dangers of jejunal ulcer arise not only from painful indigestion (the pain simulating that of duodenal ulcer, only varying its position), but also from a recurrence of symptoms of ulcer often associated with haemorrhage, and not infrequently ending in perforation.

The danger of perforation directly into the peritoneum is greater after posterior than after anterior gastro-enterostomy, as after the anterior operation omental adhesions frequently tend to prevent perforation, as shown by the first case I reported in 1903, where the ulceration ultimately reached to the abdominal wall, having passed through the adherent omentum.

But the mesocolon may also prevent perforation into the peritoneal cavity, as shown by one of the specimens exhibited, which demonstrates a gastro-jejunal ulcer that had perforated the margin of the opening between the stomach and the jejunum, and was extending into the mesocolon.

Symptoms.

If after a period of good health subsequent to the operation of gastro-enterostomy a patient begins to complain of acidity, flatulence and discomfort after meals; followed after a time by definite pain from an hour to two or three hours after food, and relieved temporarily by taking milk or some other light diet, or some form of alkali such as sodium carbonate; if the pain occurs on the left of the umbilicus, and is associated with marked tenderness and rigidity of the left rectus, the suspicion of ulcer of the jejunum will arise.

The complication of haematemesis or melaena or even the presence of occult blood in the faeces will make the diagnosis fairly certain; but if with all these symptoms a swollen and tender loop of bowel can be felt in the region of the anastomosis, or below and to the left of the umbilicus, the surgeon can no longer be in doubt as to the nature of the disease.

The symptoms of acute perforation resemble those of peritonitis following on perforation of a gastric ulcer.

Treatment.

With regard to treatment, the old adage that "prevention is better than cure" has special significance in connexion with jejunal ulcer. Not only must the profession set its face against the wholesale performance of gastro-enterostomy for every gastric ailment and limit it to suitable cases, particularly those with obstructed pylorus, but we must also try to effect such improvements in technique that jejunal or gastro-jejunal ulceration will not be likely to occur. More especially it behoves us not to neglect the medical aspect of the case, and to this end it is important that operating surgeons should bear in mind that the operation of gastro-enterostomy is at best only an incident in the treatment of diseases of the stomach and duodenum, and that the operator should in all these cases be closely allied with the physicians or the medical attendants who have the after-care of the patients. To my mind careful dieting and medical treatment subsequent to operation and for some considerable time afterwards are absolutely indispensable.

If jejunal or gastro-jejunal ulcer has been diagnosed by a recurrence of symptoms at some interval after the operation of gastro-enterostomy and the case fails to yield to general treatment, the only course open to the surgeon is to perform abdominal section and to thoroughly examine the jejunum at and near the point of anastomosis.

If the ulceration is at the gastro-jejunal anastomosis or in the jejunum, and the original ulcer at the pylorus or in the duodenum has healed, the jejunum may be detached from the stomach, the ulcerated area excised, and the openings in the stomach and jejunum closed.

If the pyloric or duodenal ulcer, in healing, has led to stenosis, an anastomotic opening cannot be spared, and either a new site for the gastro-enterostomy must be selected on the posterior wall of the stomach, or an anterior gastro-enterostomy after Roux's method may have to be done after closing the original opening.

If the ulceration is jejunal, and the area involved extensive, the diseased part of the jejunum may have to be excised, and according to the healthy condition or otherwise of the duodenum and pylorus, the healthy

jejunum may be united end to end and the stomach opening closed, or a new gastro-enterostomy may be performed at a fresh site.

Should the jejunal ulcer be distinct, and the margin of the anastomotic opening be found healthy, it may be advisable to excise the ulcer and to repair the bowel without excising the jejunum more extensively, and without interfering with the anastomotic opening.

Should the patient be profoundly ill and unable to bear a prolonged operation, a loop of jejunum some inches below the disease may be brought to the surface, and the operation of jejunostomy performed. Through a tube introduced into the jejunum the patient can be fed, and the ulcerated area, whether jejunum, duodenum or stomach, can be put at complete rest until healing is effected, when the artificial opening can be allowed to close.

I feel sure that this operation of jejunostomy has not received the attention it merits, as in extreme cases I have found it most safe and useful. I have employed it in haematemesis where the bleeding point could not be found, in chronic ulceration with great thickening, as in plastic linitis, and in chronic perforation, where the parts were hopelessly matted, and the patient was unfit to bear a prolonged operation.

But the operation of jejunostomy may be found useful in all conditions where it is necessary to give the stomach complete rest for a time, whether the disease be in the stomach or duodenum, and I believe that in many cases of ulcer near the cardiac end of the stomach, or along the lesser curvature, as also in some ulcers of the duodenum that have failed to yield to medical treatment, the operation of jejunostomy, if there is no pyloric stenosis, will come to be the operation of choice, as by its means the patient can be well fed for months without a particle of food being allowed in the stomach, thus giving the ulcer, whatever site it may occupy, absolute rest and freedom from irritation. After a period, when healing of the ulcer or ulcers has resulted, the small tube can be left out, and the minute opening will close voluntarily.

Were I speaking simply from theory I should hesitate to advance these opinions, but an extensive practical experience both of gastro-jejunosomy and of jejunostomy enables me to speak with confidence in stating my views.

The Operation of Jejunostomy.

The operation I have performed consists in taking a loop of the jejunum well beyond its origin, just sufficiently long to reach the surface without tension. A small incision is then made into the top of the loop just large enough to admit a No. 12 Jacques catheter, which is inserted and passed for fully 3 inches down the distal arm of the loop. This is fixed to the margin of the incision in the gut by a silk or thread suture, and the entrance of the tube into the bowel is further secured by two purse-string sutures one over the other. The top of the loop is fixed to the parietal peritoneum and posterior aponeurosis by two stitches and the wound closed around the tube. The patient can then be fed at once with egg, milk, and a little brandy. The whole operation can be done in from ten to fifteen minutes, and with no shock and very little visceral exposure.

As a further precaution, the loop may be short-circuited, but this is not absolutely necessary, and, should the patient be seriously ill, the short-circuiting is undesirable.

For the operation to be a success the bowel must be placed so that it will serve two purposes: (1) To permit the passage onwards of the bile and pancreatic fluid poured into the intestine above the artificial fistula; and (2) to allow of food being introduced into the fistula without fear of regurgitation either of the food or of the intestinal contents.

The feeding is done by means of a funnel and tube that will slip over the catheter, and it can be repeated every four hours, or more or less frequently, according to the requirement of the case.

The operation will be found useful in the following conditions:

1. Widespread cancer of the stomach too advanced for gastrectomy and too extensive for gastrostomy. I have found it useful in a number of such cases. By securing complete rest to the stomach, it stops haemorrhage, relieves pain, diminishes the size of the tumour and prolongs life very considerably.

2. In general cicatricial contraction of the stomach, due to the swallowing of caustic fluids, in which the stomach has been so far damaged that it no longer performs its functions or even allows of the passage onwards of food.

3. In chronic ulcer of the stomach giving rise to haemorrhage, pain, or vomiting, and to malnutrition; and where the patient is too ill to bear partial gastrectomy, which can, however, be subsequently done if thought needful after the patient's condition had been restored by adequate feeding.

4. In some cases of chronic duodenal ulcer, associated with hyperchlorhydria, in which there may be a fear of jejunal ulcer subsequently developing if gastro-enterostomy be performed.

5. In certain cases of duodenal ulcer in very stout subjects where it is extremely difficult to perform a posterior gastro-enterostomy, and in which violent haemorrhage has only recently occurred and may be again excited by dragging on the stomach.

6. In jejunal or gastro-jejunal ulcer where the patient is thought to be too ill to bear one of the extensive operations previously mentioned; or where, the disease being slight, it is thought that the complete rest to the stomach and upper jejunum that can be given by a jejunostomy will at the same time relieve the hyperchlorhydria and cure the ulcer. Neumann has, in fact, suggested the operation for hyperchlorhydria alone.

7. In recurring haematemesis failing to yield to ordinary treatment, and where on exploration no ulcer or other removable cause can be discovered.

8. In persistent vomiting threatening life, as in the severe and sometimes fatal vomiting of pregnancy, where no food whatever can be retained in the stomach.

URETHRAL CALCULI,

WITH SPECIAL REFERENCE TO ENCYSTED CALCULI
OF THE PROSTATIC URETHRA.

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NOMENCLATURE.

SOME discussion has found a place in the literature of this subject as to the proper application of the term "urethral calculus." The term should be used for all calculi which are lodged in the urethra, whether formed in the urethra itself or elsewhere. A calculus in the bladder is none the less a vesical calculus if there is evidence of its having descended from the kidney, and the same applies to urethral calculi. The question of nomenclature was first raised by Lieblein,¹ who argued that the title "urethral stone" should be used only for stones which are formed primarily in that channel, or stones arrested in the urethra which increase in size after lodgement. The same argument was developed by Kaufmann,² and has been approved by others. It would introduce, however, an entirely new principle into the nomenclature of calculi in the urinary passages, and upon clinical grounds there is much to be said against it. With regard to calculi in general, the qualifying adjective used has always been one which has reference to the site of the stone at the time of description; the adjective is clinical, and has no pathogenetic significance. The adjective "urethral" should be employed in this sense, and the attempt to give it a pathogenetic significance is, in the present writer's opinion, misdirected.

IMPACTED CALCULI.

Urethral calculi are either calculi which have been formed in the urinary passages above and have lodged in the urethra, or calculi which are formed in the urethra itself, or in some cavity or channel communicating with it.

The lodged or impacted calculi of the urethra are vesical or renal in origin. While sufficiently small to engage in the urethra they are too large to pass, and are arrested behind some natural or acquired strait in the passage. In a paper published in 1904 Englisch³ collated the records

of 400 such cases. Among these the sites of impaction were:

In the navicular fossa	...	...	11.2 per cent.
In the pendulous portion	...	...	14.5 "
In the scrotal portion	...	...	13.7 "
In the bulbous portion	...	...	18.6 "
In the membranous portion	...	...	42.0 "

No reference is made in the paper to calculi impacted in the prostatic urethra. That calculi do lodge in the prostatic urethra is well known, either in the bladder neck or where the prostatic joins the membranous portion.

It is a matter for surprise that the proportion of calculi recorded as lodged in the membranous urethra is so large when regard is had to the anatomy of this segment of the urethra. The membranous urethra is about half an inch in length, bounded above and below by the superior and inferior triangular ligaments; it is surrounded by an annular coat of unstriated muscle, and it is further supported by the fibres of the compressor urethrae. It is also a matter for surprise that Englisch should speak of the great distensibility of this portion, and explain on this ground the frequency of acquired urethral diverticula here. It is difficult to avoid the conclusion that many of these so-called membranous urethra diverticula are in reality diverticula of the prostatic urethra where it abuts on the superior triangular ligament, and that many of the calculi recorded as impacted in the membranous urethra have been, in fact, in the terminal part of the prostatic urethra. The prostatic urethra is the most dilatable portion of the channel, and once the superior triangular ligament is pierced the urethra is surrounded and supported by the muscular structures above referred to. A calculus or pouch behind the triangular ligament is of the prostatic and not of the membranous urethra. The term "membranous urethra" has not, in fact, been employed in so strict a sense by surgeons as by anatomists—even so precise a writer as Young speaks of opening the membranous urethra in the course of a dissection behind the triangular ligament.

Impacted calculi, having their origin in the urinary channels above, exhibit the varieties of structure of vesical and renal stones. They are comparatively frequently met with in children; out of 324 cases in Englisch's paper in which the age was known, 127 were under 15 years of age and 66 under 6 years of age.

In children the points of impaction are behind the natural straits of the urethra. In the adult acquired straits, that is, strictures, play the most important part in determining the site of arrest. If they remain in position they set up changes in their surroundings and also undergo changes themselves. Irritation of the urethral wall leads to ulceration, and the obstruction offered by the calculus to the stream of urine causes dilatation behind the site of impaction. The stone itself tends to increase in size by the deposit of phosphates upon its surfaces. Such secondary deposit is always phosphatic. The diagnosis and treatment of impacted urethral calculi are discussed in the textbooks and are well understood.

ENCYSTED CALCULI.

By encysted urethral calculi is here understood calculi which lie in pockets or diverticula communicating with the urethra. It is convenient to consider first diverticula of the anterior urethra in front of the superior triangular ligament (the urethra proper), and secondly, diverticula of the prostatic urethra, which is the representative of the primitive urogenital sinus.

Diverticula of the urethra proper are congenital or acquired. The congenital diverticula are due to imperfections and abnormalities in the union of the genital folds which bound the genital groove. Complete failure of union of these folds results in hypospadias; imperfect union may leave a pouch of greater or less extent, and the dermoids of the median ridge described by Timofeev⁴ owe their origin to the same cause. Such congenital pouches are almost always found on the proximal side of the glandular portion, and from this point extend for a greater or lesser extent towards the scrotal fold. Acquired diverticula are more common, and arise from a variety of causes. They may be retention cysts of urethral glands or blood cysts which burst into the urethra. Other causes are strictures and operation scars, and a urethral fistula may end in the formation of a diverticulum. An impacted