Hunterian Lecture

ON

ULCERS NEW AND OLD: JEJUNAL FOR DUODENAL ULCERS.

DELIVERED AT THE ROYAL COLLEGE OF SURGEONS,
FEBRUARY 4TH, 1916.

By SIR JOHN BLAND-SUTTON, F.R.C.S., LL.D.,
SURGEON TO THE MIDDLESEX HOSPITAL.

ABOUT fifty years ago the chronic duodenal ulcer was recognized as a clinical entity, and its treatment remained for many years in the province of the physician. Operations were performed for the relief of duodenal ulceration by Codivilla (1893), Dean (1894), and Dunn (1895). In the first decade of the present century W. J. Mayo, Mayo Robson, Moynihan, Paterson, and Sherren, and others

FIG. 1.—Dice-box shaped segment of the parts adjacent to the pylorus. The duodenal bulb contains a chronic ulcer. The parts were excised from a spinster, aged 55, who had been a dyspeptic for thirty years.

opened up a new field of surgical enterprise. We know that chronic ulcer of the duodenum is a common lesion; for some undiscovered reason, the ulcer, in the majority of instances, is situated within 2 cm. of the pylorus, and, as a rule, on the anterior wall of the duodenum, midway between its upper and lower borders. A chronic ulcer in this position is rarely

accompanied by physical signs, but it sets up symptoms so easily recognized that there is no reason for resorting to the ways of Zadiig in order to read them.

The duodenal ulcer often appears as a rounded depression in the mucous membrane with the muscular coat as its floor. In many, a layer of thickened peritoneum forms the base of the ulcer.

Occasionally it rests on the pancreas, the liver, or the gall bladder. An ulcer on the anterior wall of the duodenum may rest on the peritoneum covering the anterior abdominal wall (Fig. 1). A serpiginous ulcer may persist for years, creeping round the duodenum, scarring at one edge and deeply eroding at the other; the tissues forming its base are often diaphanous. The peritoneal surface of the duodenal bulb in such a case is often white with scars (Fig. 2). The obstruction of the pylorus that frequently complicates ulcers is often due to oedema of the mucosa. This condition also occurs with ulcers situated in the pyloric antrum (Figs. 3 and 4).

Some of the most troublesome ulcers in the pyloric region can neither be seen nor felt in the course of a gastro-jejunoscopy. A small duodenal ulcer can only be located

with certainty when it involves the peritoneum and produces a tell-tale scar. These small ulcers cause paroxysmal pain and digestive discomfort, the symptoms of "a vexed duodenum and an agitated pylorus"; this neat epigram (unearthed by Moynihan) was framed nearly a hundred years ago by Sydney Smith, the brilliant writer and preacher, who studied medicine in Edinburgh, and later in life doctored his parishioners as a rural amusement.

The chronic ulcer of the duodenum is exceptional in another feature. In all regions of the body open to observation a chronic ulcer is liable to become cancerous, especially between the thirtieth and the fiftieth years of life; this is the age incidence of duodenal ulcer. We know that chronic ulcers

of the leg, lupus-scars, and gastric ulcers occasionally become cancerous, but this change in duodenal ulcers has never been proved, although they are some of the most chronic occurring in man. I have long sought among the living, the dead, and in museums for a

FIG. 2.—A gastro-duodenal cylinder. There is a white scar on the anterior surface of the duodenal bulb. The interior of the bulb is shown in the upper figure; it contains an active ulcer; the transparent patches indicate the scars of old ulceration. Excised from a woman, aged 45.

FIG. 3.—Pyloric segment of the stomach with a callous ulcer. Excised from a dyspeptic actor, aged 48.

FIG. 4.—Pyloric orifice of the preceding specimen from the duodenal aspect; it shows oedema of the mucosa.

detached by the churning movements, are transported with the chyme into the small intestine, but an implantation cancer in the intestine above the ileo-caecal valve is unknown. Shattock suggests that shed fragments of gastric cancer would not escape tryptic digestion. I agree with him.

JEJUNAL ULCER (PEPTIC ULCER).

The jejunal ulcer that follows gastro-jejunoscopy is often called a peptic ulcer, a term implying faith in the

opinion that it is produced by the action of gastric juice. This ulcer, described by Braun in 1899, resembles the common ulcers of the stomach and duodenum and has sharp edges, often so sharp as to look as if it has been

FIG. 5.—The limb of jejunum concerned in an anterior gastro-jejunostomy. A peptic ulcer is seen in the efferent limb.

punched out. It is a dangerous ulcer, and occasionally perforates before protective adhesions have formed, and causes septic peritonitis that often has a fatal ending. Some peptic ulcers have thickened edges and run a chronic course.

A peptic (jejunal) ulcer causes pain in the epigastrium, aggravated by the ingestion of food; the symptoms often resemble so closely those associated with a duodenal ulcer as to lead patients to complain that the pain and discomfort, for which gastro-jejunostomy was performed, have returned. When a jejunal ulcer follows anterior gastro-jejunostomy there is often an area of tenderness, and sometimes a definite swelling, under the upper part of the left rectus muscle. This indicates that the ulcer involves the peritoneum on the anterior abdominal wall. I have had two opportunities of studying the changes in the jejunum that precede the formation of a jejunal ulcer, and I am able to exhibit one of the specimens.

In March, 1906, I performed anterior gastro-jejunostomy on a man, aged 44, for symptoms indicating the existence of a chronic duodenal ulcer. The operation relieved the man of his pain, and he remained in good health for nearly seven years; then the pain returned with great severity, and on the urgent representation of his medical attendant the patient was readmitted, December, 1914, into the Middlesex Hospital. He complained of pain following the ingestion of food, and there was a tender area and slight swelling under the upper part of the left rectus muscle near the costal margin. I had no doubt that the man had an ulcer in the immediate vicinity of the new stoma. With the help of x-rays and an opaque meal, the material could be seen escaping, partly through the pylorus and partly

through the new stoma. On opening the abdomen, the white scar of the original ulcer in the duodenum was visible; the area of the stomach involved in the gastro-jejunal junction adhered to the anterior abdominal wall,

FIG. 7.—The limb of jejunum in the preceding figure opened from behind to show the almost complete effacement of the valvulae conniventes.

and, on detaching it, an irregular opening appeared in the efferent limb near the gastro-jejunal junction (Fig. 5). The segment of stomach and the cylinder of jejunum involved in the junction were cut away. The opening in the stomach was closed with silk sutures and the cut ends of the jejunum were joined, end to end. The man recovered easily and quickly. The changes that have taken place in the tissues of the jejunum adjacent to the new stoma are remarkable. Normally, the mucous membrane of the jejunum is thick and thrown into folds, the familiar valvulae conniventes (Fig. 6); but in this specimen the jejunal mucous membrane in the vicinity of the new stoma is thin; the valvulae are effaced (Fig. 7) and the muscular coat is thin and transparent. The hole occupies the efferent limb of the jejunum, just beyond the cicatrix marking the union of the stomach and gut.

A consideration of the structural alterations of the jejunum in the neighbourhood of the new stoma resulting from gastro-jejunostomy leads to some conjectures of high interest. There are no valvulae conniventes in the first 4 or 5 cm. of the duodenum, and its wall is thinner than in the remaining portion; it is often dilated, and forms the bulbus duodeni.

A remarkable transformation occurs in the jejunum when the escape of chyme from the stomach is transferred, in consequence of gastro-jejunostomy, directly into the jejunum. The wall of the jejunum receiving the impact of chyme ejected through the new stoma becomes attenuated, the valvulae disappear, and the jejunal walls assume the peculiarities of the supra-ampullary segment of the duodenum. This change entails a liability to ulceration, so common in the duodenum. Thus surgery,

FIG. 6.—Portion of the jejunum laid open to show the valvulae conniventes.

the jejunum. The wall of the jejunum receiving the impact of chyme ejected through the new stoma becomes attenuated, the valvulae disappear, and the jejunal walls assume the peculiarities of the supra-ampullary segment of the duodenum. This change entails a liability to ulceration, so common in the duodenum. Thus surgery,

by changing the environment of a segment of the jejunum, has evolved during this generation a new variety of ulcer. The time required to induce a segment of the jejunum to assume the characters of the supra-ampullary portion of the duodenum will probably be determined by subsequent observations.

It is the common opinion that the duodenal ulcer is caused by the impinging of acid chyme ejected through the pylorus on to the wall of the duodenum. The features surrounding the origin of a jejunal ulcer following gastro-jejunostomy seem to support the percussion theory, but so far the discussions on the mode of origin of gastric and duodenal ulcers pay but little regard to the influence of bacterial action. Most of us believe the stomach to be amicrobic as long as it can expel its contents, but observations on the fluid found in the abdominal cavity of patients with perforated gastric and duodenal ulcers prove that it often swarms with pathogenic micro-organisms, especially streptococci. These are introduced with food, especially milk, wittily described as "our most polluted article of diet."

It is noteworthy that a jejunal ulcer is rarely seen as a sequel to gastro-jejunostomy performed for the relief of cancer of the stomach. This may be explained on the ground that such patients rarely survive the operation long enough to permit a jejunal ulcer to form. It is established that a "peptic jejunal ulcer" may make its appearance six months after gastro-jejunostomy, or be delayed ten years.

Some surgeons attribute these secondary ulcers to faults of technique, or a method of suture different from that employed by the surgeon who criticizes the report; or the suture fails to completely control the bleeding from the cut edges of the gastric or the jejunal mucous membrane, and a haematoma forms.

There is very little evidence available for the incrimination of silk or linen thread; persistent sutures have rarely been found associated with secondary ulcers of the jejunum.

INDIRECT OPERATIONS ON THE VISCERA.

Few things are more remarkable in the history of surgery during the last quarter of the nineteenth century than the origin and development of operations on the viscera. This advance was the outcome of two discoveries—anaesthesia and antisepsis. Surgical boldness and dexterity have always been available, but after the discovery of anaesthesia surgical rashness knew no bounds, but sepsis curbed it. Since the detection of the cause of sepsis, and the discovery of means for preventing it, surgical enterprise has been safeguarded.

In dealing with the viscera surgeons advanced tentatively. The effects of the removal of a particular viscus, or even a portion of it, on the physical efficiency of the individual were unknown. The internal reproductive organs of women were regarded with almost fetish reverence. Instead of removing the uterus when occupied by fibroids, surgeons removed the ovaries with the hope of establishing an artificial menopause and inducing the fibroids to shrink. Gradually men realized that the ovaries are the dominant organs of sexual life. So with the prostate. Ignorant that a big prostate could be enucleated, surgeons, actuated by false ideas as to the effects which followed removal of the ovaries, excised the testicles, or divided the vasa deferentia, with the hope of causing the prostate to atrophy.

In the case of the intestinal tract surgeons were content to make an artificial anus in order to relieve obstruction caused by cancer of the colon or of the anus. In 1881 Bryant, in the course of making an artificial anus, stumbled on a cancerous constriction, and the operation ended as an impromptu colectomy. Since that event resection of the bowel and short-circuiting have reduced colostomy to the position of an operation of despair.

The class of operations just considered may be called indirect operations—they may relieve the patient but do not remove the disease. To this class gastro-jejunostomy for the relief of duodenal ulcer may be added.

It is admitted that the most favourable conditions for gastro-jejunostomy are a pylorus blocked by an inflammatory mass, and a stomach with muscular tissue sufficiently vigorous to propel the chyme through the new

stoma. A dilated stomach with an unobstructed pylorus is so unfavourable for gastro-jejunostomy that surgeons are at their wits' end to devise means for closing the pylorus, not only to compel the chyme to take the new route, but also to hinder an efflux of bile through it into the stomach. With an unobstructed pylorus gastro-jejunostomy cannot be relied on to cure a chronic duodenal ulcer, and as it exposes patients to the discomforts and risks of regurgitant vomiting and jejunal ulcers, I have gradually abandoned it as a routine method and prefer to excise the pylorus and the segment of duodenum containing the ulcer.

THE PYLORUS.

It is difficult to describe with certainty the functions of the pylorus. That it delays the efflux of chyme cannot be denied, but the rapidity with which a foreign body is discharged from the stomach into the intestine indicates that its controlling influence is by no means great. Smooth foreign bodies under 1 in. in diameter when swallowed are soon propelled through the pylorus.

In the course of operations the normal pylorus, when first exposed, is usually firmly contracted. A few minutes later it dilates, and, except for the vein that marks the boundary between the stomach and the duodenum, the pyloric sphincter is not easily seen. When the pylorus is excised it usually admits the index finger easily, but after the parts have been immersed in preservative fluids such as a mixture of alcohol and water or formalin solution, they contract and the orifice is quite small.

The examination of museum preparations gives a false idea of the size of the pylorus and also of its functions. I believe the pylorus is extremely sensitive. Like the buccal and anal sphincters, it gives no indication of its existence unless chapped or ulcerated. A chapped lip makes feeding painful; an ulcer near the pylorus makes digestion an ordeal; and an ulcer at the anus makes defaecation a daily terror.

One day I had stretched the anal sphincter of a man to relieve pain caused by an ulcer. Crossing the garden with my house-surgeon shortly afterwards I asked him which he considered more painful, a chapped lip or a fissured anus. He replied: "I don't know, for at the present moment I've got both."

Duodenal ulcers may be mere dimples in the mucous membrane, others (miscalled fissures) deeply eroded pits, or narrow ulcers extending through the mucosa to the muscular tissue. It is conceivable that when irritated by the passage of acid chyme a spasm is set up producing painful sensations.

The common form of dilated stomach—nicknamed splashy stomach—which was mainly responsible for bringing routine gastro-jejunostomy into disrepute, is worth some attention. I believe it is caused in some cases by spasmodic closure of the pylorus. Just as the small painful ulcer, or fissure, of the anus leads to irritative action of the anal sphincter, often ending in dilatation of the rectum and the pelvic colon, so repeated spasmodic contraction of the pyloric sphincter will produce dilatation of the stomach. Convinced of this correlation of events, I have excised the pylorus in such cases, with good consequences, but on the whole the conditions which give the best results to this mode of treatment are those in which there is a gross lesion at the pylorus.

Excision of the pylorus cannot be regarded as a serious physiological loss. Removal of the pyloric half of the stomach or of the whole stomach does not interfere with the nutrition of the body. I removed the stomach from a woman, aged 35, for cancer. She survived the operation three and a half years. A year after the operation she reported herself, and at that time was in excellent health. She complained that she could not eat so big a meal as her husband, but she made up the difference by "eating two meals to his one."

It is surmised that the pyloric sphincter hinders the premature escape of undigested food into the duodenum. It has also been suggested that spasmodic closure of the pylorus, originating reflexly from the ileum, is protective against overloading the small intestine with insufficiently digested food. This is amusing, for the idea presupposes the existence of mentality in bowels, a function usually regarded as the exclusive property of the cerebrum. Keith's observations on the islets of ganglionic nerve

tissue in the walls of the intestine suggest that thoughts may arise in a man's bowels as well as impulses suggesting ideas; indeed, Menenius Agrippa's famous fable of the Belly and the Members may have more foundation in fact than the retort of Balaam's ass.

THE TECHNIQUE OF PYLORECTOMY.

When the conditions are favourable, excision of the pylorus, to surgeons accustomed to intestinal operations, is a simple matter. Favourable conditions mean a narrow and elongated pyloric segment of the stomach and the absence of adhesions between the pylorus and the liver, or the pancreas, or the transverse colon. The disparity in thickness of the gastric and duodenal walls is embarrassing to the operator, but with practice the difficulty disappears. Extensive adhesions to the pancreas or to the liver are a bar to pylorotomy. The supra-ampullary segment of the duodenum is occasionally much shorter than usual and makes the suture of the cut end of the stomach to the duodenum a difficult proceeding. In the method I employ, the abdomen is opened by a median supra-umbilical incision. The parts in the neighbourhood of the pylorus are examined in order to verify the diagnosis. The condition of the stomach is investigated as well as that of the gall bladder. When the conditions are favourable for pylorotomy, the vessels are clamped and stripped from the pyloric region of the stomach, and the loose tissue between the supra-ampullary portion of the duodenum and the pancreas carefully detached, and all bleeding vessels secured with forceps. When the pylorus is sufficiently freed from its attachments a clamp is applied to the stomach, about 5 cm. from the pylorus; the duodenum is clamped beyond the situation of the ulcer, and the pylorus excised. This is the best stage of the operation in which to ligature the vessels as they are well exposed and easily accessible.

The cut edges of the duodenum and stomach are sutured in the manner of an end-to-end anastomosis. I always use thin sterilized silk for this purpose and for ligatures. It is tedious and unnecessary to describe in detail the methods available for sewing the cut end of the duodenum to the hole in the stomach. It is like stitching a sleeve in a shirt; the clever sempstress varies her methods according to the material and the size of the garment. So with the surgeon. In a case of extensive resection (Fig. 3) the line of suture in the stomach was 6 in. across. Not wishing to imperil the safety of such a long line of suturing by joining the duodenum to it, I implanted the cut margins of the duodenum into a fresh opening in the posterior wall of the stomach.

In spite of the careful ligature of vessels, there is usually some post-operative oozing from the tissues in the wound area, and it is wise to drain for forty-eight hours. The abdominal wound is closed with through-and-through sutures, the fascia being brought into apposition with intermediate sutures of thin silk.

The first patient I submitted to pylorotomy for duodenal ulcer was a woman, aged 35, at the Middlesex Hospital, in 1909. Gastro-jejunostomy had been performed three months previously, but the pain remained unrelieved. I excised the pylorus and the segment of the duodenum containing the ulcer. She made a quick and uneventful recovery. I have since lost sight of this patient. A few days later, when operating on a man for a duodenal ulcer, I found the conditions so favourable for pylorotomy that I excised the pylorus and the bulbous duodeni with the ulcer. Six years later I re-examined him with the help of *x* rays and an opaque meal and found the gastric efflux satisfactory.

I have excised the pylorus for chronic duodenal ulcer, according to the method just described, in twenty patients. In three of them I had previously performed gastro-jejunostomy. In one the symptoms returned three months after the gastro-jejunostomy, in another six years, and in a third two years. One patient, the sixteenth in the series, died. He was a man aged 38, transferred from Dr. Wynter's ward, with typical symptoms of chronic duodenal ulcer. At the operation an ulcer was found close to the pylorus on the anterior wall of a well-marked bulbous duodeni. I departed from my usual method and sewed the cut edges of the mucous membrane with catgut. The man made good progress until the fifth day, when his temperature rose to 103°. He died on the nineteenth day after the operation. The suture line had sloughed in

two spots. I attributed the unfavourable result to the use of catgut.

SUMMARY.

Since the treatment of duodenal ulceration passed into the province of surgery it has become the routine practice to perform gastro-jejunostomy for its relief, in the hope that, by diverting the chyme through the new stoma into the jejunum, the ulcer will heal. If the pylorus is obstructed by the ulcer the results are usually good, because the chyme must flow through the new stoma, but when the pylorus is patent the chyme flows through it, and in some instances ignores the new route. This is not imagination, for the efflux can be watched with the help of an opaque meal and *x* rays. I believe it is better, whenever practicable, to excise the pylorus with the ulcerated portion of the duodenum and rejoin the stomach and duodenum on the principle of an end-to-end anastomosis. If this method could be made safe, gastro-jejunostomy for the relief of chronic duodenal ulcer with an *unobstructed* pylorus would soon be abandoned.

Experience proves that posterior gastro-jejunostomy with an *obstructed* pylorus is a beneficent operation, in spite of the risk the patient runs of getting a new ulcer for an old one. The new ulcer has been evolved during this generation by alterations in the environment of the jejunum brought about by surgery.

ANTENATAL CLINICS AND PREMATERNITY PRACTICE AT THE EDINBURGH ROYAL MATERNITY HOSPITAL IN THE YEARS 1909-1915.

By J. W. BALLANTYNE, M.D., F.R.C.P.E.,

PHYSICIAN, EDINBURGH ROYAL MATERNITY HOSPITAL; LECTURER ON
MIDWIFERY AND GYNAECOLOGY, SCHOOL OF MEDICINE OF
THE ROYAL COLLEGES, EDINBURGH, ETC.

(Continued from p. 236.)

Autumn Quarter, 1914.

THE autumn quarter of 1914 saw 40 patients pass through the prematernity ward. Of these women, 7 were admitted for "convenience," and in this year "convenience" meant generally that these expectant mothers were the wives of Reservists and Territorials who had been summoned to the colours on the outbreak of the war. Even in these cases, however, it was a comfort to be able to make certain by actual pelvimetry that the pelvis was normal and the chief bodily systems healthy. Seven other women were kept in the ward on account of pelvic contraction; in 5 of them induction of premature labour was carried out, 1 was sent home as the date of induction was not due for some time, and in 1 (on whom it had been necessary to perform pubiotomy before) there appeared to be a permanent enlargement which permitted the natural delivery of a living child. In one of the induction cases living twins were brought into the world, but both died when two days old; in 2 the child lived, and in the other 2 it perished (in one instance antenatally and in the other after birth). In all these induction cases it was a great advantage to be able, daily if necessary, to test whether the head could engage in the pelvic brim by means of the Müller manoeuvre; thus the best time for induction could be chosen. There was one other woman upon whom induction was performed, but in her case the operation was carried out because of the large size of her previous babies, causing their intranatal death; a living child weighing 7 lb. was successfully delivered and survived.

An interesting case was that of a woman whose previous four children had all been dead-born. She was sent in because she was becoming melancholic. For four weeks she was kept in hospital and her various functions regulated. At the delivery the cord was round the neck and arms, but a living and surviving child was born and the melancholia rapidly disappeared. Two other women were admitted on account of melancholia. One of them had albuminuria and suffered from condylomata of the vulva, but her blood gave a negative Wassermann reaction; the albuminuria was treated and she was safely delivered of a healthy infant. The other patient had signs of pyelitis