A Clinical Lecture

ON

CANCER OF THE STOMACH.

DELIVERED AT GUY'S HOSPITAL

BY

R. P. ROWLANDS, M.S., F.R.C.S.,

SURGEON TO THE HOSPITAL.

THE deaths from cancer of the stomach are rapidly increasing. In England and Wales there were 7,078 in 1919 and 8,135 in 1921. Very few of these patients ever come to the surgeon; many do not see a physician or even their general practitioner until it is too late to operate. This is partly due to the fact that gastric cancer is frequently a terminal disease in old people, for more die of this condition between the ages of 60 and 70 than in any other decade,¹ so that the early symptoms are often overlooked or thought to be the natural result of old age. Even when an early and correct diagnosis is made in these old people a radical operation is considered to be too formidable. There is also a very prevalent opinion among the public that cancer of the stomach is necessarily fatal, and that no operation can either cure or afford much relief. The majority of patients who see the physician or surgeon come so late that either no operation can be performed or the difficulty and mortality of operation are very great; at the best, in these late cases, the prolongation of life is short, with the natural result that the public get a bad impression of the operation.

Better education of the public and of the rank and file of the medical profession, leading to earlier diagnosis and operative treatment, would bring far better results. It should be made more generally known that both the immediate and the ultimate results of early operation are good: the immediate mortality should not be more than 10 per cent., and at least one-quarter of the patients should be alive and well five years after the operation. These operative results are satisfactory for a disease which has a 100 per cent. mortality under medical treatment. At present, out of ten cases which reach the surgeon, resection is only possible in two and gastro-jejunostomy for the relief of obstruction in three, the remainder being inoperable.

Many cases of cancer of the stomach could be prevented by earlier and better treatment of chronic gastric ulcer, which is the main precursor of gastric cancer. Sherren² and Moynihan³ maintain that at least 50 per cent. of cancers of the stomach arise in chronic gastric ulcers, and find direct microscopic evidence that cancer started in an ulcer in one-quarter of the specimens of cancer removed at operation. Moreover, one-tenth (Moynihan) to one-twentieth (Sherren) of supposed chronic gastric ulcers removed by them showed evidence of early cancer. Pauchet⁴ contends that as many as 75 per cent. of cancers of the stomach arise in simple ulcers. Others deny any direct relationship between gastric ulcer and gastric cancer, but it is significant that cancer attacks just those parts of the stomach which are subject to ulcers and that the clinical history of chronic or recurring gastric ulcer is obtainable in the majority of cases of cancer of the stomach. In this connexion MacCarty's⁵ view is important. He asks the practical question:

"Is cancer often associated with chronic gastric ulcer? From an experience of more than 1,400 gastric specimens I can state that the association is so frequent that if I had a chronic gastric ulcer I should always consider the possibility of cancer being present, and I know of no clinical or laboratory methods by which the differential clinical diagnosis can be made. From actual experience

also I know that chronic gastric ulcers with a diameter greater than 2.5 cm. are cancerous. I do not know whether the cancer or the ulcer was primary, but I do know that I would not temporize with the chronic gastric ulcer."

SYMPTOMS.

Cancer of the stomach should be suspected in any patient, especially over 35 years of age, who suffers from obstinate dyspepsia with anorexia, wasting, anaemia, pain, vomiting (especially coffee-grounds), and achlorhydria. It should be remembered, however, that not more than 50 per cent. of early cancers of the stomach show achlorhydria, and that in over 25 per cent. free hydrochloric acid is either normal or excessive.

DIAGNOSIS.

When cancer of the stomach is suspected it is of the greatest importance to settle the diagnosis without delay, and, with this object, every useful examination should at once be made; a fortnight is ample time for every investigation to be completed. The most reliable help is afforded by x-ray examinations by an expert. Persistent delay, defective filling, and distortion of the shadow are practically conclusive. (Fig. 1.) Carman maintains that he can make a correct diagnosis by x rays in over 96 per cent. of the cases submitted to him, but I have not found the x-ray reports so accurate as this. Further, Carman and MacCarty state that if an ulcer has a crater of over 2.5 cm. it is

almost certain to be malignant. This is a valuable observation, but it is not entirely reliable, for I have excised several larger chronic gastric ulcers which were proved by subsequent microscopic examination to be innocent. In doubtful cases it is important to take a Wassermann reaction in order to exclude syphilis of the stomach, although this is a very rare disease. There is some danger of mistaking pernicious anaemia for cancer of the stomach, but the characteristic changes in the blood in the former condition should prevent this mistake.

Carcinoma of the body of the pancreas presents difficulties, for this condition, unlike the same disease in the head of the pancreas, does not cause jaundice. The patient has much pain, wastes rapidly, and is anaemic. Negative x-ray examinations and the absence of blood in the gastric juice or in the faeces should generally prevent this mistake. As already pointed out, it is quite impossible in many cases to distinguish between chronic ulcer and carcinoma of the stomach without microscopic section.

INDICATIONS FOR OPERATION.

When all available methods of examination have been exhausted without settling the diagnosis an exploration of the abdomen is necessary if cancer of the stomach is to be found and treated in its hopeful stages, and this exploration should be resorted to without delay. When cancer is excluded by exploration some other disease is generally found, such as peptic ulcer or cholelithiasis, which can be best treated surgically. Negative explorations for late cases are to be avoided, whenever possible, for they carry a high mortality, chiefly from pulmonary complications. The following points indicate that an exploration is useless.

1. Bad general condition. When the general condition of the patient is so poor that he cannot be expected to stand a major operation, such as partial gastrectomy, it is a pity to submit him to an exploration, but his health may be greatly improved by careful dieting, rest, gastric lavage, and sometimes by blood transfusion before operation. In some cases a preliminary short-circuit for pyloric obstruction has the same beneficent effect, allowing a resection to be carried out at a later date (see Case ii).

2. Evidence of secondary growths. It is useless to explore a patient when hard enlarged glands are felt, especially

FIG. 1.—Case iii; copy of radiogram of stomach taken by Dr. Lindsay Locke.

at the root of the neck, or when secondary growths are felt in the pelvic peritoneum on rectal or vaginal examination. Any nodules at the umbilicus, in the liver, or anywhere in the abdomen, especially with ascites, are strong contra-indications to exploration.

3. Size, position, and fixation of the growth. A palpable tumour is by no means a contraindication to resection, for even a simple gastric ulcer may sometimes be felt in a thin abdomen; but the size and position of the tumour are most important, for if it is large, and particularly if it extends upwards under the left costal margin or starts in the cardiac part of the stomach, resection is not likely to be practicable. Fixation of the tumour is also very important, for if it cannot be moved from above downwards and from side to side resection is impossible. Accurate radiographic examinations give valuable help by indicating the site and extent of the growth as well as the size and capacity of the healthy part of the stomach.

As regards gastro-jejunostomy for cancer, it is generally admitted that this is of no use and should not be performed unless there is definite obstruction. In these circumstances it is a humane operation, prolonging life and making death less terrible. It does not often prolong life for more than six months, although I have known a few patients survive for two or three years in comparative comfort.

OPERATION.

This commences as an exploration to establish or complete the diagnosis and to determine the proper treatment. A long paramedian incision is made in the epigastrium, either to the right or to the left of the middle line, according to the position of the growth. The incision extends from the costal angle to below the umbilicus. The growth, glands, and peritoneum are carefully examined to see if resection is practicable. If the liver and the peritoneum are free of secondary growths, everything depends upon the extent and fixation of the primary growth and the presence of secondary glands about the head of the pancreas and the coeliac axis. If the primary growth extends along the lesser curvature nearly to the oesophagus partial gastrectomy will be of no avail, and, in my opinion, complete gastrectomy is hardly ever worth doing, for it carries a very high mortality and is generally followed by rapid recurrence. Those who survive it for any length of time without recurrence develop an intractable form of anaemia simulating Addison's (pernicious) anaemia. Considerable invasion of the pancreas is generally a contraindication to resection; involvement of the transverse colon or of its mesentery is not so serious, for these parts can be resected with justifiable additional risk.

Choice of Operation.

This depends upon the site and extent of the growth. In many cases it is necessary to remove the pylorus and

Fig. 2.—Polya-Balfour union.

from one-quarter to one-half of the stomach. After extensive resections direct union of the stomach and duodenum, after Billroth's first method, is impracticable without undue tension.

Therefore the duodenum is closed and the side of the jejunum is anastomosed directly to the cardiac remainder, after Polya's method. It is better to place the loop of jejunum in front of the transverse colon, after Balfour's method,⁶ for if recurrence takes place, as it often does about the pancreas and transverse mesocolon, obstruction of the anastomosis is not so likely when this method is used. (Fig. 2.)

When the primary growth is small Billroth's first method is an excellent one, especially if it is carried out after W. J. Mayo's plan.⁷ Mayo mobilizes the lesser curvature, removes the whole of the gastro-hepatic omentum with its contained glands and a considerable part of the lesser curvature of the stomach, along which the growth so often

spreads. He also points out that the intramural spread rarely extends more than 3 cm. from the edge of the primary growth, and that it is not necessary to resect the stomach so widely as has so often been done, provided that the lymphatic vessels and glands are extensively removed. The wound in the stomach is sutured along the lesser curvature, so that the diameter of the opening left is not appreciably larger than that of the duodenum. With modern methods of suture the danger of leakage at the "angle" is negligible. (Fig. 3.)

Fig. 3.—Billroth No. 1, modified by W. J. Mayo. A, Part removed. B, Method of union.

When the growth is in the mid-gastric area and is not too extensive, sleeve resection, with wide removal of the lymphatic glands, is indicated, and both the immediate and ultimate results of this operation compare favourably with those of other forms of resection.

Operation in Two Stages.

In some feeble and old patients, and especially in those suffering from severe pyloric obstruction with vomiting and rapid wasting, it is sometimes necessary and wise to perform the operation in two stages, and, in these circumstances, a preliminary gastro-jejunostomy, well to the left of the growth, is indicated. The improvement that follows this operation is often so marked that it is difficult to persuade the patient that another operation is necessary, and it is therefore well to explain the plan of procedure before the first operation. Secondary resection of the growth is sometimes made somewhat more difficult by the previous gastro-jejunostomy, which limits the mobility of the stomach and sometimes makes it difficult to divide the latter far enough away from the growth. When this has been removed the openings in the jejunum and stomach are closed, and the anatomy of the parts is like that of Billroth's second method, which is rarely performed as a primary operation nowadays because it is unnecessarily complicated and prolonged as compared with the Polya-Balfour method.

The following three cases may serve to illustrate some of the points of this lecture. They afford striking contrasts: the first, an early case operated on with complete success, the patient being well nine and a half years after partial gastrectomy; the second, a late case with severe anaemia, calling for preliminary short-circuit and secondary resection; and the third, a very late case, beyond resection, who survived anterior gastro-jejunostomy for only a few days.

CASE I.

Mrs. E., aged 41, a patient of Dr. Brackenbury. She had suffered increasingly from indigestion for three years. Recently she had haematemesis and had wasted rapidly. She often vomited large quantities. Radiography revealed pyloric obstruction. I had felt a tumour of moderate size in the epigastrium a little to the right of the middle line. The patient looked ill and anaemic, was vomiting large quantities about once a day, and was unable to take more than liquids. I therefore advised operation.

Operation on August 21st, 1915 (Dr. Brackenbury present).—A long incision was made in the epigastrium to the right of the middle line. A dilated stomach, hypertrophied and oedematous, was found, and a pyloric ulcer of large size extending half-way along the lesser curvature from the pylorus, around which it formed a ring which was hard and felt like carcinoma. As the stomach was particularly movable and there were no growths in the liver, pelvic peritoneum, or glands, I decided to resect the diseased part, and this was done without delay. The gastric artery was double ligatured and divided, the left gastro-epiploic also, then the great omentum close to the transverse colon, and the right gastro-epiploic and pyloric arteries. The duodenum was crushed one inch beyond the pylorus and sealed with a running suture of linen thread and then invaginated by two purse-strings

of the same material. A loop of jejunum was brought up through the transverse mesocolon and sewn to the back wall of the stomach along a selected line, a little on the cardiac side of the middle of the stomach. Thick black thread was used. The stomach was divided near the line already mentioned between two clamps so that no leakage occurred. An opening the same size as the one in the stomach was made in the jejunum and an anastomosis made as in gastro-jejunostomy, black thread being used throughout. The sewing of the jejunum to the stomach before the growth was removed greatly facilitated the operation, for the growth was useful as a tractor, and later on the attachment to the jejunum prevented retraction of the stomach during the insertion of deep sutures. The opening in the jejunum began four inches from the end of the duodenum, and by starting it here there was no tension upon the first part of the jejunum and duodenum. Only two layers of sutures were used for anastomosis. The great omentum was not removed but drawn up over the anastomosis and the stump of the duodenum. The opening in the transverse mesocolon was closed by two interrupted sutures. The operation lasted forty-five minutes and the patient was not shocked after it. She was infused during the operation, two pints being run into the armpits.

She was very well the next day, but vomited once or twice. On August 23rd she frequently vomited small quantities of offensive green material, and, as half a pint of sodium bicarbonate solution was given without affording any great relief, the stomach was washed out at 5 p.m. A very large quantity of bilious liquid was withdrawn and the patient felt much better. She was up on the tenth day, and walking about on the thirteenth and eating almost full diet. She rapidly gained weight and did very well. When last heard of, in December, 1924 (ten years later), she was still in excellent health.

CASE II.

A man, aged 64, had had gastric symptoms for years, with some melaena. When admitted to Guy's Hospital he was thin and very anaemic. He was sent up with the diagnosis of duodenal ulcer, but the diagnosis in hospital was carcinoma of the pylorus, with obstruction.

Operation on May 25th, 1922.—Dr. E. A. Scott, the anaesthetist, considered that he would not stand a long anaesthetic and operation owing to his anaemic and bad condition. I therefore performed posterior gastro-jejunostomy well away from a definite pyloric carcinoma, the size of a Tangerine orange, completely encircling the pylorus, ulcerated, hard, and at one side piercing the muscle wall of the stomach and showing peritoneal nodules. There were no secondary growths anywhere, and partial gastrectomy was thought advisable (possibly after blood transfusion) three to four weeks later. However, the patient improved so much that blood transfusion was not necessary before the second operation, which was performed on July 10th, 1922, when about half the stomach was removed. The growth proved to be a columnar-celled carcinoma. Good recovery followed, and when last heard of (January, 1925) he was in excellent health, less anaemic, and better nourished, and in regular work, cleaning cars.

CASE III.

Mr. G., aged 65, after suffering from severe chronic gastritis for three months, was sent by his medical attendant to see a consulting physician, who, instead of a thorough investigation, advised a three months' holiday in Devonshire. After two months the patient returned to London because he was wasting and vomiting so much. Investigation at New Lodge Clinic demonstrated defective filling of the middle of the stomach and complete absence of hydrochloric acid, with much blood in the gastric juice. There was a movable tumour in the left epigastric angle. Laparotomy was advised in the hope that partial gastrectomy would be possible, but the site and extent of the growth made me take a gloomy view of the case. The patient asked for another radiographic examination, and this was done by Dr. Lindsay Locke, confirming the New Lodge findings. I hoped that a mid-gastric sleeve resection would be possible.

Operation on November 2nd, 1922.—A large carcinoma was found in the lower mid-gastric region. It encircled the stomach and markedly constricted it, leaving only a narrow vertical slit. The cardiac pouch was considerably dilated, and its anterior wall folded forwards and to the right in front of the stricture. There were enlarged glands on the lesser curvature, and also below the greater curvature where the growth had come through the peritoneum of the stomach and had infected the general peritoneum, there being many minute nodules all over it, especially in the pelvis. There were also larger lumps in the great omentum, but no secondary growths in the liver. The primary growth could have been removed, but the secondaries negated resection. Complete obstruction was clearly impending, therefore an anterior gastro-jejunostomy (beginning in the jejunum ten inches down) was performed, the posterior operation being impossible owing to the position of the growth. Death occurred from bronchitis with exhaustion a week later.

REFERENCES.

- ¹ Registrar-General's Report, 1921. ² Sherren, J.: *Lancet*, 1920, i, 691. ³ Moynihan, Sir B.: *BRITISH MEDICAL JOURNAL*, 1920, ii, 100. ⁴ Pauchet, V.: *Presse Médicale*, 1920, November 6th, p. 193. ⁵ MacCarty, W. C.: *Collected Papers of the Mayo Clinic*, 1922, xiv, 95. ⁶ Mayo, C. H.: *Ann. Surg.*, 1919, lxx, 237; and *Collected Papers of the Mayo Clinic*, 1919, xi, 41. ⁷ Mayo, W. J.: *Collected Papers of the Mayo Clinic*, 1922, xiv, 84.

THE PREVENTION OF PUERPERAL MORBIDITY AND MORTALITY:

AN EXPERIMENTAL STUDY IN CLINICAL OBSTETRICS.*

BY

FRANCES IVENS, M.S.,

CLINICAL LECTURER IN OBSTETRICS AND GYNAECOLOGY, UNIVERSITY OF LIVERPOOL; HONORARY SURGEON, LIVERPOOL MATERNITY HOSPITAL; HONORARY GYNAECOLOGICAL SURGEON, LIVERPOOL STANLEY HOSPITAL.

In this paper I propose to give a short account of a series of consecutive midwifery cases which have occurred under my own general supervision in a municipal maternity home. I do so because I am of opinion that it is only by a detailed study of so-called normal labour, and of the slighter cases of puerperal morbidity, that we shall arrive at a full knowledge of the etiology of puerperal sepsis and the explanation of the terrible cases of fulminant puerperal septicaemia occurring after an apparently normal labour. When in possession of that knowledge we may hope to formulate a scheme to eliminate some of the dangers of maternity, and to decide upon a reasonable technique for the actual conduct of labour.

No one can have read the recent correspondence in the *BRITISH MEDICAL JOURNAL* without being struck by the great diversity of opinion expressed both with regard to the lack of improvement in puerperal statistics and the apportionment of blame for such a deplorable condition of affairs. Recently the published statistics of a practitioner¹ throw a doubt on the reliability of the statistics on which these statements are made—and I think he is probably right.

I do not think it can be denied, however, that even if puerperal mortality has really diminished there is still a vast amount of ill health among women of the poorer and middle classes which is the result of the traumata of labour, of sepsis, or of infection present in the patient before parturition. For a good many years I have been interested in this subject from a gynaecological standpoint, and it occurred to me that it would be both interesting and useful to make observations from the obstetrical side to determine how far these results were inevitable, or, if preventable, how they could be prevented. Accordingly I undertook, at the invitation of Dr. Hope, then medical officer of health for Liverpool, the supervision of the new maternity home which was started on his initiative, and which the lack of housing accommodation after the war made so necessary.

The home is small; it can take in only fourteen patients; but since its opening in 1920 1,000 women have been admitted. It was arranged that I should see, as far as possible, every case before admission, and I attended a weekly clinic at the home when women desiring admission presented themselves for examination.

After notes of the case had been taken and the urine tested, I examined each patient, measured the pelvis, and made an internal examination to determine the diagonal conjugate. A specimen of any abnormal discharge was sent to the city bacteriologist for report. Cases of active syphilis or gonorrhoea were referred to a special institution, as the size of the home did not permit of satisfactory isolation. Cases of albuminuria, cardiac disease, or hyperemesis were admitted for ante-natal care, and abnormal cases were kept under regular observation so that the obstetrical treatment required might be carried out at the proper time. The home was well equipped for simple cases, but any requiring Caesarean section were sent to the Stanley or Maternity Hospital, either before labour or when it had started. Each case was as far as possible admitted a day or two before the anticipated date of delivery.

On admission, after a preliminary abdominal examination has been made by the matron or sister, the regulation bath is given and a dose of castor oil and an enema. Before any internal examination is made the vulva is shaved and washed very thoroughly with lysol solution

* Read at a meeting of the London Association of the Medical Women's Federation. A brief abstract was published in the *BRITISH MEDICAL JOURNAL* of March 7th (p. 460).