GASTRECTOMY*

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The reason for the choice of gastrectomy as the subject of my discourse tonight is that, despite the fact that this operation has become a common and popular procedure, its history is nevertheless a recent one. It is a procedure that merits meticulous attention to detail in the choice of suitable candidates and the performance of the operation as well as the pre- and post-operative treatment, in order to achieve the excellent results that follow upon this procedure when adequately and efficiently performed.

Dr. Wolfowitz
'*Portrait Moderne*' *by Jane Plotz*

The history of gastrectomy is of extreme interest. In the year 1929 Finney and Rienhoff,[1] in an exhaustive review of gastrectomy, found 67 cases in the world literature. This was only 30 years ago, and today that figure is the number of gastrectomies performed by an average surgeon in one year of practice. This indicates the tremendous progress this procedure has made. These authors stated: 'It would appear that credit for having first conceived the idea of resection operations on the stomach must be given to a certain famous professor, highly respected and renowned amongst the medical profession of Philadelphia.'[1] This statement is based on the authority of Merren, of Giessen, who in 1810 contributed a monograph entitled 'Certain surgical operations and experiments on animals, illustrated by facts'. The surgeon's name was not mentioned, nor has it ever been discovered. It appears that the operation was conceived by this unknown surgeon out of the sufferings of a colleague and beloved friend of his, a certain Dr. Middleton. The hazard was so great in the eyes of this far-thinking surgeon that he would not undertake the operation on his friend, but 2 years later performed it on several dogs, resecting the pylorus—in every case with a fatal termination.

The study of the data and a comparison of dates led others to believe that this surgeon was John Jones, a native of Philadelphia, who was the first Professor of Surgery at Kings College, New York, subsequently to become the College of Physicians and Surgeons, and now known as Columbia University.

Merren, stimulated by this work, continued the experiments on dogs, and concluded that the operation, although a very difficult one, was feasible for humans. His criteria for surgery enunciated nearly a century and a half ago would be acceptable even today. They were, in his own words:

1. If the patient seem a sure prey of death, after having been sick for a long time, and after every other attempt had been tried to no avail;
2. If we find by placing the fingers within the right region an unmistakable hardening;
3. If a short time after eating the patient suffers from obstruction of the bowels and chronic vomiting.

In 1877 Billroth made his famous prophecy whilst speaking on the operation of gastrorrhaphy, i.e. the closing of a fistulous opening in the stomach: 'From this operation to the resection of a piece of carcinomatous stomach there is still only a bold step to be taken.' In 1881, only 4 years later, he performed the first pylorectomy for carcinoma. In 1884 Phineus Connor, of Cincinatti, performed the first total gastrectomy in man, but the patient, moribund at the time of operation, died on the table of shock.

In 1897 Schlatter performed the first successful total gastrectomy in man, anastomosing the oesophagus to the jejunum. This patient, a woman aged 56, survived for 1 year and 53 days, when she died of a recurrence of her carcinoma. Brigham, of Boston, reported the second successful case in 1898, and anastomosed the oesophagus to the duodenum. Richardson, of Boston, in the same year reported the third, and in 1900 Marvil reported the fourth.

Patterson, in a Hunterian lecture in 1906, reported on a total of 27 total gastrectomies in the world literature. Since this lecture the advance of gastric surgery has been rapid, and has included the illustrious names of Finsterrer, Mayo Robson, the Mayo brothers, Polya, Balfour, Hofmeister, Moynihan, and a host of other legendary figures who pioneered this work and reduced the mortality from 53·8% in 1929 to 1% today.

It is noteworthy that this procedure originated in a desire to alleviate suffering that responded to no other form of known treatment, or in an attempt to save life where other treatment had failed. These basic indications remain the indications for surgery of the stomach today, and I therefore introduce the subject of gastrectomy with the indications for its use.

INDICATIONS FOR GASTRECTOMY

A. Carcinoma

This is the prime indication for this type of surgery, and gastrectomy remains the only treatment today for carcinoma of the stomach, the duodenum (first and second parts)—in association with other surgery for carcinoma of the ampulla of Vater—the pancreas, and the lower end of the oesophagus. The value of total gastrectomy for carcinoma of the stomach has been open to criticism in recent years. If the lesion is such as to warrant so extensive a procedure as total gastrectomy plus splenectomy plus removal of the omentum plus a gland clearance, then obviously it is not the correct answer to this disease. The success of the manœuvre is debatable because it only prolongs life for a short while, and attendant upon this type of surgery is the post-operative life of intestinal invalidism marked by diarrhoea, nutritional disturbance, haematopoietic deficiency, vitamin insufficiency, inanition, and even possible eventual death from the physiological upset caused by the operation, or death from recurrence of a disease that was so extensive as to warrant such a radical undertaking.

It is my opinion, therefore, that the indications for total gastrectomy are small, and will dwindle still more in the future.

Partial gastrectomy, however, remains today the only available method of treatment for malignant disease of the stomach, the lower end of the oesophagus and the first part of the duodenum. Physiologically this also is not the final answer in the treatment of the disease, but until other weapons become available, it will remain the only resource in the attempt to cure the cancer, prolong life, or alleviate suffering. There is a wide concept in the profession that carcinoma of the stomach is still to be regarded as a fatal disease despite surgery, but this concept must be denied, for it is the experience of many of us present here this evening that carcinoma of the stomach, the lower end of the oesophagus, the duodenum and the ampulla of Vater can be cured by subtotal gastrectomy. For carcinoma of the stomach my own 5-year survival rate is 20%; accepted figures all over the world vary from 19 to 25%, but in one or two centres the rate is given as high as 30%.

Since publishing my original article on total gastrectomy in December 1950 I have been unhappy about the procedure, and latterly have almost entirely abandoned the total operation. Pack, of New York,[2] has recently stated that carcinomas of the stomach, treated by subtotal gastrectomy in 95% of cases, will be cured if recurrence has not manifested itself within 3 years of the date of operation.

B. Sarcoma

Sarcomas of the stomach comprise only 1% of all tumours of the stomach. They may be leiomyosarcoma, spindle-cell sarcoma, lymphosarcoma, neurogenic sarcoma, and myeloid infiltration of the stomach; 40% of sarcomas of the stomach are lymphosarcomas. The diagnosis of sarcoma of the stomach is only established with any certainty by histology. Gastrectomy is the treatment of choice in this tumour, although in some cases the tumour is sensitive to radiation and cure or relief by radiotherapy is possible.

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C. Benign Tumours

Adenoma is the commonest type of simple tumour of the stomach and, because of its tendency to undergo malignant change, partial gastrectomy is the treatment for this condition. Because of the difficulty of macroscopic differentiation it would appear that other simple tumours of the stomach warrant a similar form of treatment, these being leiomyomas, fibromyomas, adenomyomas, myxofibromas, haemangiomas, fibromas, lipomas, neurofibromas, and dermoid cysts.

Should the diagnosis be established in these tumours without doubt by frozen section performed at the time of operation, then, in adenoma of the stomach, sleeve resection of the portion of the stomach wall involved is permissible in the isolated tumours, but more extensive resection is advocated for multiple simple tumours, even to the extent of total gastrectomy for polyposis of the stomach.

D. Syphilis

Syphilis of the stomach, listed in many previous text-books of surgery as a disease of the stomach that may warrant surgery, has been omitted in the more recent publications. Shackelford, in his *Surgery of the Alimentary Tract* published in 1955, omits the disease entirely.

In 25 years of practice I have come across only one case of a gumma of the stomach diagnosed pre-operatively, in a man with a long syphilitic history in whom, despite exhaustive antisyphilitic treatment, no response was forthcoming. Gastrectomy was performed for relief of symptoms, which was complete.

E. Volvulus

Volvulus of the stomach is not a common condition, but I have had the privilege of dealing with 6 cases. There are 2 types of volvulus, viz. the organo-axial and the mesentero-axial, indicating the axis round which the volvulus occurs. Volvulus of the stomach may be primary or secondary. In the secondary type it is associated with such conditions as carcinoma of the transverse colon, enlarged spleen, and simple or malignant tumour of the stomach or pancreas. In the primary type the cause is not definitely known; it is found in the obese individual with a heavy pendulous omentum as well as a large 'J'-shaped stomach, despite a broad costal margin.

In my opinion the treatment of choice for volvulus of the stomach is a partial gastrectomy with removal of the omentum. There are, however, other schools of thought; for instance, Norman Tanner advises fixation of the stomach to the under surface of the liver, with a shortening of the gastro-hepatic omentum. The results of gastrectomy are so good in this condition that I unhestitatingly advise it.

F. Trauma of the Stomach

Trauma of the stomach is not unusual, but on the occasions that I have seen this condition only once was it necessary to perform a gastrectomy because of the massive destruction of the stomach. Usually the lesion can be repaired.

G. Corrosive Poisons

A further indication for surgery of the stomach is the late effects of corrosive poisons with residual deformities of the stomach and possible obstruction.

H. Chronic Hypertrophic Gastritis

I have on several occasions had to perform gastrectomy for hypertrophic gastritis where this has been associated with prolapse of the gastric mucosa into the duodenum or with haemorrhage. Patients suffering from this condition are often disabled with severe dyspepsia or multiple haemorrhage, which are not easily relieved by medical measures.

I. PEPTIC ULCER

The vexed question of the peptic ulcer should be separately considered under duodenal ulcer and gastric ulcer, for the reason that duodenal ulcer is primarily a concern of the physician, whereas gastric ulcer should be considered as a surgical disease. I have laid down the principle in my own practice that all gastric ulcers, particularly acute ones, when first discovered, should be given 4 weeks of stringent medical treatment with hospitalization. If at the end of the 4 weeks the patient has not completely recovered, both clinically and radiologically, then I advise surgery. There are, however, further criteria which indicate immediate surgery rather than a 4 weeks' trial of medical treatment, viz. (*a*) gastric ulcer with radiological evidence of a large crater, (*b*) gastric ulcer with achlorhydria, (*c*) a gastric ulcer of any description on the greater curvature, and (*d*) chronic pre-pyloric gastric ulcer.

In duodenal ulcer, surgery is indicated in the following conditions:

1. *Perforation.* The operation may be either closure or gastrectomy, depending on the circumstances of each individual case. In a survey of 2,224 cases from 16 Scandinavian hospitals Andreas Hoyer,[3] of Oslo, reports that in 8 hospitals immediate partial gastrectomy was performed for perforated peptic (gastric or duodenal) ulcer; in 5 hospitals only closure of the perforation; and in 3 hospitals there was no standard treatment. In the 2,224 cases the percentage of duodenal ulcers was 72% (Table I).

TABLE I. TREATMENT OF 2,224 PATIENTS WITH PERFORATING GASTRIC OR DUODENAL ULCERS IN 16 SCANDINAVIAN HOSPITALS (ANDREAS HOYER[3])

Treatment	*No. of Cases*	*No. of Deaths*	*Rate of Mortality %*
Simple suture or excision and suture	1,364	137	10·0
Partial gastrectomy ..	763	43	5·6
Conservative treatment (no operation)	97	49	50·5
Total	2,224	229	10·3

2. *Pyloric obstruction* or hour-glass constriction of the stomach.

3. *Haemorrhage.* Operation for haemorrhage in gastric and dudodenal ulcer is attended by a total mortality of 20%, according to a report by Snyder and Berne[4] of the University of Southern California. They state that the mortality of haemorrhage from gastric ulcer not operated on was 75%, and of haemorrhage from duodenal ulcer not operated on, 12·3%. This is a strong argument in favour of treating haemorrhage from a gastric ulcer surgically. My own mortality generally for peptic ulcer is 10% when surgery is performed for haemorrhage.

Acute haemorrhage occurring under the age of 40 from duodenal ulcers should be treated conservatively, because in the large majority of cases the haemorrhage ceases in 24-36 hours. With gastric ulcers this may not be the case, and a close observation should be maintained for 36 hours. If haemorrhage persists after 36 hours, as evidenced by a rising pulse rate or drop in blood pressure and a drop in haemoglobin plus repeated haematemesis or melaena, it is then my practice to institute surgery immediately for either gastric or duodenal ulcers.

In patients over the age of 40 the likelihood that haemorrhage will cease of its own accord drops progressively with age because of the state of the arterial tree. If the patient recovers from an initial haemorrhage I apply the dictum that no patient with a peptic ulcer should be allowed to bleed more than twice and therefore two episodes of haemorrhage are an indication for surgery.

4. *Failure* of reasonable and adequate *medical therapy* is an indication for surgery in duodenal ulcer. By reasonable and adequate medical therapy I imply that hospitalization and correct medication and diet have been tried on at least two independent occasions with symptomatic and radiological improvement in the ulcers. A practitioner does not hesitate to advise surgery for other types of pain. Why then subject the patient with duodenal ulcer to years of episodes of pain and still maintain him on medical treatment?

5. *Economic factors.* With the hastening trend of modern living it is necessary for the breadwinner to be fit and well in order to maintain his economic and social position. When he is incapacitated for a long time from duodenal ulcers, with intervals of time in bed or off work, the economic factor becomes one of the commonest indications for surgery.

6. *Penetration.* The duodenal ulcer that is penetrating because of chronicity, with pain in the back, etc.

7. *Blood group.* Where the patient belongs to a difficult blood group.

Surgical Procedures

The national committee on surgical procedures for peptic ulcer of the American Gastroenterological Association have evaluated the results of various surgical procedures undertaken in 1,923

cases of duodenal ulcer. For gastric ulcer it is accepted that partial gastrectomy alone is the operation of choice, but for duodenal ulcer the procedures advised were (1) vagotomy, (2) gastro-enterostomy, (3) vagotomy plus gastro-enterostomy or pyloroplasty, and (4) partial gastrectomy. The results of vagotomy were indifferent. Gastro-enterostomy has been abandoned except in the case of complete pyloric obstruction in a patient who is desperately ill. After vagotomy plus gastro-enterostomy the incidence of stomal ulcers was much higher than with gastrectomy, and haemorrhage still occurred from the original duodenal ulcer. The conclusion of the committee, therefore, is that partial gastrectomy is the operation of choice in duodenal ulcer.

Results of Partial Gastrectomy

The mortality in my cases of gastrectomy, excluding those operated on for haemorrhage, is 1·2% (6 deaths), but in those operated on for haemorrhage the mortality is 10%.

The average length of stay in the nursing home is 2 days for pre-operative preparation, and 11 days for post-operative care.

The immediate complications are as follows:

Subphrenic abscess (2 cases)	0·4%
Haemorrhage requiring operation	*Nil*
Haemorrhage requiring conservative treatment (1 case)	0·2%
Intestinal obstruction requiring operation (2 cases)	0·4%
Duodenal stump leakage	0·4%
Temporary oedema of the stoma	10·0%
Peritonitis	*Nil*
Pancreatitis	*Nil*

The delayed complications are as follows:

Stomal ulcer	*Nil*
Dumping syndrome—immediate	10·0%
after 6 months	5·0%
after 1 year	1·0%
Afferent loop syndrome	*Nil*
Post-gastrectomy inanition (3 cases)	0·6%

These figures are accurate as far as can be ascertained but, should stomal ulcer have occurred in cases that I have operated on, it is possible that they may have gone elsewhere for further treatment.

Burger and Pick,[5] in a study of 301 patients with duodenal ulceration treated by means of vagotomy and gastro-enterostomy, report stomal ulceration or recurrent ulceration in 4·25% of cases. The same authors report the incidence of malignancy in gastric ulcer as 15%.

Santy, Michaud and Garde,[6] in reviewing 102 recurrent ulcers after gastro-enterostomy and 23 after gastrectomy, report an incidence of 15-20% of recurrent ulceration after gastro-enterostomy and 3 to 4% after gastrectomy. In most of these the recurrent ulceration occurred in the first 2 years.

It would appear from these results that the treatment of choice for peptic ulceration is partial gastrectomy; but at this stage it should be stated that if the incidence of stomal ulcer is to be kept low, then the gastrectomy must be high; in other words, 7/8ths of the stomach must be removed to ensure that the whole acid-bearing area of the stomach has been ablated.

PROCEDURE

Gastrectomy has become so common that there is a tendency amongst surgeons to treat the operation lightly, and this will lead to mortality, failure, and poor results generally. The operation is one of some magnitude, and must always remain so, and it requires to be treated with the respect it deserves. To that end I have laid down the following principles:

1. Gastric surgery should not be undertaken by a lone surgeon. If the results are to be adequate, like most major surgical procedures it requires the services of a team, which should consist of the surgeon and a permanent assistant such as a partner, or a full-time assistant, or a registrar who regularly works with the surgeon. Every surgeon doing this type of surgery should have his own theatre sister, who becomes an expert in the technique of the operation. The ward nursing staff must be constant, and must periodically be instructed in the pre- and post-operative care of these patients so that the regime laid down shall be accurately followed. The surgeon should regularly employ the same anaesthetist, who in turn will accustom himself to the blood and fluid requirements during this operation, as well as the care of the patient on the operating table. A haphazard performance of this type of operation, without the services of a trained team, must be condemned.

2. The operation is never undertaken without a full investigation of the patient's cardiac condition, which is examined by X-ray and electrocardiography, the state of his lungs (also confirmed by X-ray), and his renal and hepatic function. For the liver I am satisfied with a protein investigation, the albumin-globulin ratio, and the prothrombin index (the PI is becoming more essential than ever before in surgical procedures, because of the large numbers of people who are taking anti-coagulants, such as dicumarol, as well as its value as a test of liver function). For renal function I am satisfied with a blood urea and a chemical and microscopic examination of the urine. Naturally, a full blood count is done on every patient.

3. Every patient is hospitalized for 48 hours before operation, except in case of emergency. During these 48 hours his stomach is washed out twice daily with a saline solution until the washings are clear. During this pre-operative period the patient is also given penicillin and streptomycin twice daily and, if the prothrombin index is low, 3 doses of vitamin K at intervals. My theatre sister instructs the patient in this pre-operative period in his breathing exercises and limb exercises. He is instructed how to get in and out of bed with an abdominal wound, and she explains to him in great detail the nursing procedure which he has to undergo, viz. that the naso-gastric tube will be put down and left down for 12 hours before operation, that specimens of blood will be taken for tests, and that his blood will be grouped for blood transfusion. She also instructs him about his feeding—that he will have nothing by mouth for 24 hours after operation—and he is told how to wash his mouth out without swallowing. He is also taught how to turn from side to side, and how to maintain himself in a semi-Fowler position and assist the nursing staff in washing him and changing him. It is explained to him that he will be fed intravenously for 48 hours after the operation, and thereafter will receive a gradually increasing diet until the date of his discharge.

The night before the operation he is visited by my partner or myself, his confidence is established, and his fears allayed. A barbiturate sedative is given the night before operation.

4. *Post-operative care.* During the operation the patient receives 500 c.c. of blood, assuming that the blood count is normal and that the operation is not attended with any undue amount of shock or blood loss. The operation should not last more than 1-1¼ hours; I am of the opinion that surgery beyond 1 hour requires major supplementary shock treatment and, as most of these operations are carried out on middle-aged persons, the risk increases with the duration of operation. Added to this, the efficiency of the surgery decreases rapidly after 1 hour.

When the patient returns from the theatre his bed is blocked at the foot, and as soon as he has recovered from the anaesthetic he is allowed sufficient pillows to bring him into a semi-Fowler position. It is my practice to use a draining jejunostomy in place of naso-gastric suction after surgery, a practice in which I follow Dr. Arthur Allen, of Boston. The jejunostomy is immediately connected to a bottle and drains dependently.

During the first 24 hours after operation the blood pressure and pulse rate are taken every 15 minutes for the first 2 hours, and every ½ hour for the next 6 hours. It is then taken every hour for the ensuing 24 hours, and thereafter twice daily for 3 days.

The patient is allowed as much omnopon as is required to keep him free of pain, and his breathing and limb exercises are commenced as soon as he is fully cooperative. At the conclusion of the blood infusion he is given 2,000 c.c. of invert sugar in water during the summer months, and 1,500 c.c. during the winter months. All this fluid flows in within 12 hours, i.e. a total of 2,000-2,500 c.c. in the first 24 hours. The drip is then removed and the patient is allowed to rest.

After 24 hours he is allowed ½ oz. of sterile water by the mouth hourly for the next 12 hours, and then 1 oz. of sterile water hourly for the following 12 hours, bringing us to 48 hours from the time of operation, whereafter he is allowed fluids by mouth *ad lib.*

In the 2nd post-operative day the patient is given a mixture consisting of 3 g. of potassium chloride and 4·5 g. of sodium chloride in 1,000 c.c. of invert sugar and water, plus further invert sugar and water to maintain him in a positive balance in relation to his fluid loss through the bladder and the jejunostomy drainage and his insensible loss. Once again this fluid is introduced

during daylight hours, and the drip is removed in the evening so that the patient has an undisturbed night.

On the morning of the 3rd day the drip is re-inserted and the same formula administered, whilst at this stage the patient is taking fluids *ad lib.* by mouth.

On the morning of the 4th day an assessment is made of whether the patient is able to continue with oral feeding alone. This will depend on whether bowel sounds are heard (they are now usually evident), and whether his intake by mouth is greater than his loss through the jejunostomy. If this is so, then the jejunostomy tube is raised to the level of his stomach and, if there is no spill over after 6 hours, the jejunostomy is then clamped off and on the afternoon of the 4th day the patient is allowed jelly, ice cream, and fluids *ad lib.*

On the morning of the 5th day he commences on a Meulengracht diet in small quantities, being fed every 2½ hours, and as soon as he has passed flatus is given ½ oz. of liquid paraffin morning and evening. The bowels usually act on the 4th or 5th day, and the patient's progress thereafter is undisturbed, being maintained on a Meulengracht diet until the 7th day when he is allowed a grilled chop, and on the 8th day he is allowed fillet steak with vegetables, not purée.

On the morning of the 9th day his stitches and jejunostomy tube are removed, and leakage from the jejunostomy usually ceases by the morning of the 10th day, when the patient may be discharged from the nursing home.

From 24 hours after operation the patient is got out of bed in the early morning before the drip is inserted, and in the evening after the drip has been removed, and from the morning of the 3rd day is encouraged to walk round his room. From the 4th day onwards he walks up and down the corridor assisted, until, usually by the 6th day, he is able to walk alone. He is encouraged to walk to the toilet from the 4th day onwards.

During this post-operative period my theatre sister calls on him on several occasions, and confers with the sister-in-charge on the adequacy of the calorie intake in his diet and on any symptoms of over-feeding or dumping; and a strict control is kept so that he is not allowed an excessive carbohydrate intake, which is often the cause of dumping.

The patient's haemoglobin is checked on the 7th day and, if necessary, a further blood transfusion is administered on this day.

During the first 4 post-operative days the patient is given injections of penicillin and streptomycin twice daily and of vitamins A, B and C once daily. On the morning of the 5th day vitamins A, B and C are administered by mouth.

He is visited by my partner or myself at least twice daily, and a routine examination of his lungs, abdomen and lower limbs is also made twice daily. In the event of any clinical disturbance of fluid or electrolyte balance, his electrolytes are determined, daily if necessary, and corrected accordingly. A strict adherence to this routine of pre- and post-operative treatment is one of the prime factors in what, I am pleased to say, are my satisfactory results.

The same applies to the operation. Each detail of the operation has been elaborately gone into with a view to standardizing the procedure, saving time, and minimizing trauma to tissue and shock, as well as post-operative complications.

*The Operation**

The type of procedure that I have adopted as a routine is the Polya-Hofmeister retrocolic iso-peristaltic type of partial gastrectomy, wherein 7/8ths of the stomach is removed. We have in latter years, where indication has presented itself, attempted the Billroth procedure in a number of cases, but I am satisfied that the results of the Billroth procedure, although it is said to be a more physiological operation, are certainly no better than those of the Polya-Hofmeister, and perhaps not as good. I am convinced that in a duodenal ulceration the Billroth procedure has no place.

The operation is done under general anaesthesia through a mid-line incision. The skin towels are stitched on in order to produce haemostasis of the skin edges and to ensure that infection from the skin will not enter the wound during operation. After a general exploration of the abdominal cavity the lesion is inspected and, if operation is proceeded with, the gastro-colic omentum is divided between haemostats and ligated with 40 linen thread. The right gastro-epiploic artery is individually ligated and the peritoneum dissected off the back of the pylorus. The right gastric artery is isolated and ligated with 25 linen thread and 2 catgut plain. Stay sutures are placed on either side of the duodenum, and the De Petz clamp is placed across the duodenum, thus sewing in two layers of metal clips.

The duodenum is then divided with the diathermy and the stump of duodenum invaginated with waxed-silk interrupted sutures. The cut end of the stomach is covered with a gauze swab tied into position. The left gastro-epiploic artery is now ligated and cut, and 2 short gastric arteries are ligated for gastric ulcer (3 for duodenal ulcer).

A safety ligature of 25 linen thread is then tied round the origin of the left gastric artery, and this artery is tied again with a double ligature where it curves forward onto the lesser curvature of the stomach. Another De Petz clamp is placed across the stomach and 3/4ths of the stomach removed for gastric ulcer (7/8ths for duodenal ulcer).

An opening is then made in the transverse meso-colon and the first portion of the jejunum is brought through this opening. The jejunum is stitched to the cut end of the stomach, the duodeno-jejunal flexure being approximated to the lesser curve, thus allowing of no afferent loop of jejunum. An anastomosis is performed leaving a large valve and a small anastomosis of not more than 1¼ inches. The whole anastomosis is then brought through into the greater sac and the opening in the meso-colon stitched round the stomach. A 22 catheter is next introduced into the jejunum 6 inches distal to the anastomosis, the catheter entering into the stomach, and this is brought out through a separate stab incision in the left loin through a hole in the omentum. The blood is then sucked out of the subdiaphragmatic spaces and the wound is closed in layers, the peritoneum with atraumatic chromic catgut no. 1 and the linea alba with interrupted 60 linen thread. The gastric suction tube is removed at the conclusion of the operation.

CONCLUSION

I have attempted to outline what my opinion is about gastrectomy, and the procedure that I have adopted in my private practice. The same efficiency cannot be achieved in hospital practice because medical and nursing personnel have to be trained and routine cannot be standardized. There can be no unanimity amongst surgeons in this respect. I am satisfied that my results compare favourably with those recorded in the literature and, whilst not trying to impress upon you that this is the only procedure for gastrectomy, I have attempted to give you my views as far as I possibly can in the short time available. There are many aspects of this problem, particularly in regard to symptomatology, pathology, physiology, diagnosis, and so on, which for reasons of time I have not even attempted to touch on.

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* This part of the address was illustrated with lantern slides.