SOME ADVANCES IN THE SURGERY OF THE OESOPHAGUS*

BY

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It is my intention to give a picture of the present positions of some of the pathological conditions met with in the oesophagus. As regards cancer I propose to confine my remarks to the condition as it affects the thoracic and abdominal parts of the gullet. The results obtained at the present time are disappointing until we remember the hopeless nature of the condition only a few years ago. The first successful removal of a thoracic oesophagus was described by Torek in 1913, and no further success was recorded until Grey Turner reported a case in 1933, the oesophagus in this patient being removed by the collo-abdominal or pull-through method. In 1933 Ohsawa, in Japan, had recorded his experiences with 101 patients in the preceding seven years. In 18 of these the tumour involved the lower end of the oesophagus or cardia, and resection was carried out with immediate anastomosis. No fewer than eight of these patients survived. This publication was in Japanese and did not attract general notice at the time. The surgeons who were then interested in the oesophagus mostly aimed at removing the gullet at the first operation, and, in the rare event of the patient surviving, restoring continuity by means of an antethoracic oesophagus.

In 1937 Nissen, of Basle, reported a case of transthoracic resection of the cardiac end of the stomach and lower oesophagus for a simple ulcer, with an immediate anastomosis. This was probably the first successful anastomosis of this type either in Europe or in the Americas, and I would like to take the opportunity of drawing attention to this very early success although it was carried out for a non-malignant condition. When we feel depressed to-day we should remember that when Grey Turner delivered the Macewen Lecture in 1939 he referred to the remarkable experience of Dr. Garlock, of New York, "who in the last two years has had no less than three consecutive cases in which he was able to remove a malignant oesophagus by the transthoracic route and with the immediate recovery of the patient."

The conception of an immediate anastomosis has been accepted and all the operations on the oesophagus in recent years have aimed at this. There have been variations in the method of approach and in the means by which continuity is restored, and it is clear that the level of the growth determines which operation is suitable. In 1946 Ivor Lewis described the operation in which the stomach is mobilized through an abdominal incision; the oesophagus is then explored, and, if possible, resected through the right side of the chest. Continuity is restored by bringing the stomach up to the cut end of the oesophagus.

Allison and Borrie (1949) have advanced the surgery of the cardiac end of the stomach by drawing attention to the place for radical block excision of the stomach in these cases.

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Diagnosis

X-ray examination is essential in all cases of dysphagia, and it is usually necessary to carry out oesophagoscopy. Oesophagoscopy occasionally discloses cases in which the diagnosis of carcinoma would otherwise have been missed, and, what is more gratifying, a number of patients are encountered in whom the symptoms and the radiological appearance are strongly suggestive of cancer but who later prove to be suffering from benign conditions. This fact must be remembered when successful results are claimed from irradiation in the absence of histological confirmation of the diagnosis (Figs. 1 and 2).

FIG. 1.—The extent of the malignant stricture has been determined by placing the patient in the Trendelenburg position after some of the contrast medium has passed the stricture.

Method of Treatment

The only hope of radical cure is that offered by surgical excision. Irradiation is occasionally a satisfactory palliative treatment, but even for this purpose it has serious disadvantages in that fistula formation is sometimes precipitated. It is necessary to keep an open mind on the question, because recent methods of application in which the patient is rotated during treatment have given better results.

Another form of palliation, successfully carried out by Negus, is that of implantation of the growth with radon seeds through the oesophagoscope. This method requires a very high degree of endoscopic skill, and it deprives the patient of the possibility of a successful radical removal. It should therefore not normally be advised unless inoperability can be inferred or deduced without exploration.

Souttar tubes are occasionally of great value in those patients who are not in a fit condition for any form of exploratory thoracotomy. The drawback of the Souttar tube is that, in the very case in which it would be most suitable and useful, difficulties are encountered in its introduction.

Inoperable growths can be short-circuited. This method has particular application in the middle third of the oesophagus, where a comparatively small growth may be firmly fixed to the root of the lung.

Recently a great interest has been taken in the use of plastic tubes either to replace a portion of the oesophagus

FIG. 2.—An irregular filling defect of the middle of the thoracic oesophagus closely simulating cancer but which was proved to be benign.

large part or almost the whole of the stomach may be displaced into the chest, while the cardia remains in its normal position, will not affect the sphincter, and consequently oesophagitis is not produced. A combination of these two types occurs, known as a rolling hernia, in which the oesophagitis is a frequent complication (Fig. 3).

Results of Regurgitation of Gastric Juice

Superficial ulceration takes place which tends to heal and break down again. This ulceration produces spasm in the muscular coats of the oesophagus and later cicatricial contraction. Both processes lead to a gradual shortening of the oesophagus and to stricture formation.

Symptoms

Pain, dysphagia, and symptoms due to haemorrhage may all occur, together or separately, and the severity of each symptom may vary from a slight disturbance to a major illness. The pain is characteristically retrosternal and is produced by any posture or movement which encourages regurgitation. Movements such as stooping down to tie up the shoes or lying flat in bed will all tend to aggravate the pain. Besides being felt as a heartburn or retrosternal pain, radiation often occurs down one or both arms and up into the angle of the jaw. When this happens a diagnosis of cardiac pain is sometimes made, or if the distribution is very extensive the symptoms are often attributed to necrosis. The spastic contractions of the circular muscle and later the cicatricial changes will each produce dysphagia, although the spastic element will tend to improve spontaneously if the oesophagitis becomes less. The dysphagia varies from a subjective feeling of food sticking to inability to take any food whatsoever. The bleeding is usually intermittent and insidious, and in fact is suspected only when the patient is found to be grossly anaemic. Massive haemorrhage occurs occasionally in these patients, and is usually due to the fact that the stomach has been drawn up into the chest as part of the pathological process and a chronic gastric ulcer has developed in the thoracic stomach.

The diagnosis of the condition is made by x-ray and oesophagoscopy examination. It may be confused on occasion with carcinoma on the one hand and true cardio-spasm or achalasia on the other.

Treatment

The heartburn from which these patients suffer is often attributed to duodenal ulceration, and the treatment prescribed may be sufficient to relieve the symptoms. In any event, the duodenal ulcer patient who has a high gastric acidity and whose stomach possibly empties slowly owing to spasm at the pylorus will also suffer from reflux oesophagitis should his cardiac sphincter be incompetent. Where pain and anaemia are the most marked features medical management should be given a trial in the first instance. The regime adopted should be exactly that used in treating a duodenal ulcer, with the difference that great emphasis must be placed on avoiding all postures and movements which encourage regurgitation. This regime is sufficient to improve a considerable number of patients. Even if there is some degree of stricture formation, a strict medical regime together with dilatation of the oesophagus may prove effective, but dilatation by itself must never be used in these patients because the result will be fresh stricture formation at a higher level.

If simple measures fail or severe stricture formation is present, or the presence of an ulcer in a thoracic stomach is proved or suspected, operation must be undertaken. The nature of the operation depends on the changes which have occurred in the oesophagus and whether it is possible to restore the anatomical arrangement at the hiatus to normal. If this is the case an operation aimed at replacing the stomach in the abdomen and retaining it there by suturing the phrenico-oesophageal ligament to the undersurface of the diaphragm is the basis of the procedure. This ligament,

described by Allison (1951), is not recognized by some surgeons, but there is usually no difficulty in demonstrating its presence and using it in the manner described. Decreasing the size of the actual hiatus is of little importance, because the opening in any event is an elastic one and its increase in size is brought about by the cone of stomach forcing its way upwards. If the stomach is kept down, the crus of the diaphragm will conform to the lower end of the oesophagus. As an adjunct to this form of repair I make a point of dividing both vagi to decrease the gastric secretion. To overcome the ill effects of the vagotomy the pyloric sphincter is divided. This procedure may disclose a number of cases of unsuspected duodenal ulcer.

If there is a long stricture present or a chronic ulcer has formed in the thoracic stomach, simple restoration of the anatomy is no longer effective and resection must be undertaken. The extent of the resection and the method of restoring continuity will vary according to the particular circumstances.

Hiatal Hernia and Reflux Oesophagitis in Infants

Infants present a difficult problem in that the symptoms of reflux oesophagitis may be confused with those of pyloric obstruction, and an operation for the latter condition is sometimes carried out. In some patients there seems no doubt that pyloric spasm makes the symptoms of reflux oesophagitis more apparent. The cardiac sphincter in infants is not well developed, and if too large a feed is given regurgitation will take place without any difficulty. It seems that in certain circumstances ulceration is produced either because the gastric contents are more irritating than usual or because the oesophageal epithelium is unduly sensitive. Once oesophagitis has started a vicious circle is set up and spasm and actual cicatricial contraction may occur, producing shortening of the oesophagus and stricture formation. It seems that the process can be arrested and reversed and the stomach may return to its normal abdominal position.

Treatment for these infants should again be medical in the first instance, posture being of great importance. Occasionally a gastrostomy may be called for. Anatomical repair of the hernia in the sense that the stomach is held down in its proper position, as has already been described, may be required, but it is often difficult to decide when this should be done. If the condition has been neglected or misdiagnosed, the destruction of the lining of the oesophagus and the surrounding fibrosis may be so severe that resection has to be carried out. For this reason, if a conservative or an expectant line of treatment is adopted in the early stages, a careful watch must be kept on the child and repeated x-ray examinations made so that any deterioration in the oesophageal condition can be dealt with at once. The management of these small patients sometimes presents very great difficulty.

Simple Strictures due to the Swallowing of Corrosives

The swallowing of corrosives, either accidentally or with suicidal intent, may result in the production of severe strictures, and recently there has been a tendency to treat these strictures by resection because of the supposed difficulty of carrying out dilatation effectively. The management of these strictures calls for painstaking care. After preliminary x-ray examination, oesophagoscopy is carried out, and it is sometimes found that an unsuspected foreign body lies above the stricture. Oesophagoscopy is seldom successful, because the interval between the dilatations is bound to be considerable, and the presence of the rigid instrument in the gullet interrupts normal peristaltic waves which help in the swallowing of the bougie. For these reasons "auto-dilatation" is to be preferred. The method is quite safe provided no force is used, and it is successful in nearly every case. When the stricture is so severe that a preliminary gastrostomy is called for the patient is encouraged to swallow a ureteric catheter, which is then recovered through

the gastrostomy opening and utilized as a guide for introducing a rubber tube and eventually a series of bougies of increasing size. By one or other of these methods dilatation has been successfully carried out in every case.

It is noteworthy that one patient, who had been burnt with nitric acid, had a fistula into the trachea and false passages in his oesophagus, the results of attempts at oesophagoscopy dilatation. Another patient, who had swallowed hydrochloric acid, had burnt the lower end of the oesophagus and also the pylorus, producing a stricture at each site. Yet another patient had had what appeared to be complete obliteration of his oesophagus for a period of 19 years. Patience is required in treating strictures of this nature by autodilatation, and the treatment must be continued for several years, but the final result should be a complete return to normal. Ten patients have been treated in this way in the past 20 years.

Congenital Atresia of the Oesophagus

It is very pleasant to finish my address by mentioning the great progress which has been made in the treatment of this anomaly. The condition was described by Gibson in 1697 and again by Sir Arthur Keith (1910) and others, but no patient was successfully operated upon until 1939, when a staged operation was carried out by Ladd (1944). The first completely successful operation of direct anastomosis was carried out in 1941 and reported by Haight and Towsley in 1943.

The commonest type of deformity is an atresia of the oesophagus at the level of the vena azygos arch, with the lower segment of the oesophagus arising from the trachea. This type of deformity accounts for 80% of the patients,

and in most of the others there is an upper and lower blind segment without any communication with the trachea. It is difficult to estimate the frequency of this anomaly because even now many infants die from what is attributed to pulmonary or cerebral conditions and the true diagnosis is not suspected. Similarly death may be attributed to an imperforate anus when the real cause is an oesophageal anomaly.

Cyanosis and attacks of choking in the newborn infant should at

FIG. 4.—Radiological appearance of congenital atresia of the oesophagus with fistula. The blind upper segment can be seen, and the fact that air is present in the stomach and intestines shows that there is a fistula between the lower segment and the trachea.

once suggest the possibility of an atresia of the oesophagus, and if a well-lubricated catheter, passed down the oesophagus via the mouth, is arrested at a point 10 cm. from the alveolar margin it is almost certain that the condition exists. The infant should then be transferred to a centre where x-ray confirmation and operation can be carried out (Fig. 4).

Both the operation and the anaesthesia require special experience and must be carried out very delicately. The subsequent nursing is of equal importance, and unless experienced and conscientious nursing is available it is useless to attempt the surgical treatment of these patients.

In my own first successful case the patient is now 7 years old, and altogether I have 17 patients who have recovered from the operation.

Conclusion

Many of the procedures in oesophageal surgery have now passed the pioneer stage and taken their place amongst the accepted operations. Some of them will always carry a very great risk, and for this reason it is essential that diagnosis should be accurate and that due consideration is given to the problem before embarking on this form of surgery. The treatment of cancer is still largely palliative but is none the less well worth while carrying out. Reflux oesophagitis presents a complex problem affecting patients of all ages. The symptoms may vary from a minor disturbance to a crippling or killing disease, and much work is needed to elucidate the underlying causes. The gastric secretion in infants requires further investigation and in adults there is scope for the simultaneous estimation of gastric and oesophageal pressures. The association of duodenal ulcer with reflux oesophagitis demands close study, always bearing in mind the possibility that in some patients at least the reflux oesophagitis appears to precede the formation of the hernia.

The problems connected with the diagnosis and treatment of oesophageal conditions require special methods and technique. This does not imply still narrower specialization, and in fact a broad approach is needed, because to understand and appreciate the various conditions affecting the oesophagus it is essential to have a knowledge of abdominal conditions in general and peptic ulceration and its complications in particular. Familiarity with the oesophagoscope and experience in paediatric surgery are also required. In fact the narrower the field the more general must be the approach.

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AMYLOIDOSIS IN RHEUMATOID ARTHRITIS, AND SIGNIFICANCE OF "UNEXPLAINED" ALBUMINURIA

A REPORT OF EIGHT CASES

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The complication of rheumatoid arthritis by amyloidosis is more often diagnosed by the pathologist than by the clinician. Fingerman and Andrus (1943) found amyloid deposition in 13 of 61 (21%) necropsied cases of rheumatoid arthritis. Teilum and Lindahl (1954) have reported an instance of 60%. By contrast, Hench and co-workers (1948) have stated that "the association of amyloidosis and rheumatoid arthritis rarely occurs, and then only in severe cases of long duration." On the clinical side, reports have been for the most part confined to single or at most two cases. The only clinical investigation of a population of rheumatoid arthritics for amyloidosis has been that of Unger *et al.* (1948),