

A review of the management of 100 cases of benign stricture of the oesophagus

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One hundred cases of benign stricture of the oesophagus treated over a period of 11 years from 1960 to 1971 under the care of the senior author (D. M. M.) at Frenchay Hospital Thoracic Unit are reviewed. The results indicate that the commonest site of the lesion is in the lower third of the oesophagus and that the commonest cause is peptic oesophagitis due to gastric reflux and associated hiatus hernia. As the disease is commoner in the elderly a conservative medical regimen of dilatation, antacids, and posturing is recommended as the first line of treatment. When this fails surgery is necessary. Collis (1965) managed 69 patients by gastropasty. Belsey (1965) reported his experience with colon transplants, while Brain (1967) and Allison (1970) advised jejunal transplantation. Our experience has shown that in view of the old age and often poor physical condition of these patients resection of the stricture and oesophagogastric anastomosis is a relatively safe and simple procedure. The results obtained indicate that 25% of patients operated on will require future dilatations.

INCIDENCE

Thirty cases occurred in males, while 70 were in females, giving a male-female ratio of 30:70=1:2.4. The average age of each patient was 69 years. The youngest sufferer was an 11-year-old girl who developed a stricture of the upper and lower thirds of the oesophagus following the ingestion of acetic acid. The youngest patient with a benign stricture of the oesophagus associated with hiatus hernia and reflux was a girl aged 16 years. It was noted that the disease was much more common in the elderly and that 85% of patients were over 60 years of age.

AETIOLOGY

All patients investigated had an initial barium study and the results indicate that the commonest cause for benign oesophageal stricture is oesophagitis following hiatus hernia. Oesophageal strictures may also be associated with previous oesophageal surgery and are usually due to subsequent scar tissue formation following the repair of the hiatus for hiatus hernia.

The symptoms (Table II) varied in duration from one month to a maximum of eight years. The average time the patient suffered from these symptoms before presenting for treatment was 14.5 months.

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TABLE I

100 CASES OF BENIGN STRICTURE OF THE OESOPHAGUS

Cause	No.
Hiatus hernia	89
Previous surgery stomach/oesophagus	8
Hiatus hernia repair	5
Heller's operation	1
Heller's operation and partial gastrectomy	1
Partial gastrectomy	1
Post-cricoid upper third (unknown)	2
Acetic acid	1

TABLE II

Dysphagia	99%
Heartburn/indigestion, worse on bending or lying flat	46%
Vomiting	28%
Weight loss	25%
Poor appetite	12%
Haematemesis	5%

POSITION OF STRICTURE

This was assessed both by barium swallow and oesophagoscopy.

The results of the barium swallow also showed that 86 (90%) of the 95 cases of lower third strictures were associated with hiatus hernia while in 9 (9%) cases there was no associated hernia. In strictures of the lower third of the oesophagus the length (assessed by barium swallow examination) varied between 1 cm and 7 cm with an average

TABLE III
100 BENIGN STRICTURES

Site	No.
Lower third oesophagus	95
Middle third oesophagus	1
Upper third oesophagus	2
Double strictures:	
Upper third and lower third	1
Middle third and lower third	1
Total	100

of 2.8 cm. In only four cases of oesophageal stricture and hiatus hernia was a duodenal ulcer demonstrated. D'Abreu, Collis, and Clarke (1971) report an incidence of less than 10% between hiatus hernia and duodenal ulcers, indicating no strong relationship between these diseases.

Only one stricture of the middle third of the oesophagus and one involving the middle third and the lower third of the oesophagus were found. Both were associated with hiatus hernia and reflux. There were three cases of strictures involving the upper third of the oesophagus. One was associated with a lower third stricture and followed ingestion of acetic acid. The other two cases involved only the upper third of the oesophagus and, although one case also had a hiatus hernia, no obvious cause could be found for these strictures. Allison (1970) claims that in these cases the oesophagus below is lined with columnar epithelium and that there is a demonstrable hiatus hernia with incompetence of the cardia and with reflux.

All patients had a full blood count performed and it was noted that the haemoglobin varied between 60% and 103% and that the average haemoglobin was 87%. However, in 38% of patients the haemoglobin was less than 85%. In all cases the mean corpuscular haemoglobin concentration fell in the range of 29–35 with an average of 32. Thus 38% of the patients who presented with a benign oesophageal stricture exhibited a normocytic, hypochromic anaemia.

MANAGEMENT

On admission all patients had a chest radiograph, barium meal, full blood count, electrolyte estimation, and an electrocardiogram. Patients dehydrated because of dysphagia were rehydrated with intravenous fluids, and any anaemia was corrected by transfusion. All patients were then oesophagoscoped under general anaesthesia and an attempt was made to dilate the stricture with bougies. If the stricture was dilated easily the patient was kept in hospital for a further 48 hours. After 24 hours the patient was

TABLE IV
100 CASES

Dilatation and medical regime	66
Surgery primary procedure	34
Later required surgery	16
Total surgery	50
Total medical	50

permitted to take fluids at first and solids later, and was then discharged home to be re-admitted in two months for further dilatation, the intervals being progressively increased if possible.

Before leaving hospital all patients were advised to adhere to a strict hiatus hernia regime. This consisted of frequent small meals, and alkaline powders (half a teaspoonful five or six times daily) to coat the lower oesophageal mucosa in order to protect it from acid regurgitation. They were also advised to avoid unnecessary bending and to sleep with the head of the bed raised on blocks 6 to 9 inches high.

If it was difficult, dangerous or impossible to dilate the stricture the patient was recommended to accept surgery. Furthermore, if the radiograph and oesophagoscopy suggested that the lesion was suspicious of malignancy, surgery was also recommended. The commonest operation was resection of the stricture with oesophagogastrostomy, but in a few cases interpositioning of a segment of jejunum was performed.

A strict follow-up was kept on all patients. Those recommended for conservative treatment were regularly oesophagoscoped and dilated with bougies at intervals varying between two months and two years, depending on the severity of their dysphagia. A total of 50 out of 66 patients were satisfactorily managed by these conservative measures for periods of up to 11 years and required no further treatment.

Of the 66 patients, 16 developed progressive dysphagia or oesophageal ulceration and it was not possible to dilate the stricture satisfactorily. These were recommended for surgery, and resection of the oesophagus was carried out between six months and seven years (average 26 months) from first presentation.

All patients undergoing oesophagogastrostomy were advised to sleep with the head of the bed raised on blocks for the rest of their lives. They were also placed on a hiatus hernia regimen as previously described, as they were now prone to gastro-oesophageal reflux which could cause further oesophagitis and stricture formation at the anastomosis.

In one patient the oesophagus was perforated during oesophagoscopy and bouginage and imme-

TABLE V

Total surgical management	50
Oesophagogastrostomy	43
Resection of stricture and jejunal interposition ..	5
Mousseau-Barbin tube	1
Oesophagotomy and resuture of upper third stricture	1

mediate thoractomy was performed. Resection of the oesophagus was not possible and a Mousseau-Barbin tube was inserted. A young girl of 11 who had suffered from a stricture of the upper and lower thirds of the oesophagus due to acetic acid required surgery. A longitudinal incision was made in the upper third of the oesophagus and the stricture was sewn up transversely. Thereafter the lower third was readily dilated and her swallowing became satisfactory.

SURGICAL MANAGEMENT

Of the total of 100 cases, 34 were treated primarily by resection of the oesophageal stricture and a further 16 cases of failed dilatation were referred for surgery, making a total of 50 (Table V).

In all cases of lower third stricture left thoracotomy was performed and oesophagogastrostomy was the operation of choice. Jejunal interposition was originally tried, but due to the precarious blood supply of the segment and doubts as to whether the symptomatic result was any better, this procedure was abandoned.

Oesophagogastrostomy was performed by mobilizing the oesophagus up to the arch of the aorta. The diaphragm was then opened radially and through the left half of the right crus and the stomach was mobilized along each curvature to within two inches of the pylorus. The lower third of the oesophagus and the upper third of the stomach were resected and the stomach was closed in two layers using catgut and 6-0 linen thread brought up into the chest and fixed with a stitch. The proximal cut end of the oesophagus was then anastomosed to the stomach end-to-side using a single layer of interrupted 38 gauge monofilament stainless steel wire. Stainless steel was preferred because it causes less reaction and scar tissue formation at the anastomosis than other materials.

COMPLICATIONS AND DEATHS

During dilatation the oesophagus was perforated in four out of the 100 cases described. Two of the patients were treated with intravenous fluids and Ryle's tube aspiration and eventually recovered.

Immediate left thoracotomy was performed in the other two cases. In one, oesophagogastrostomy was performed and the patient made an uneventful recovery. In the other, it was not possible to perform oesophagogastrostomy, and a Mousseau-Barbin tube was inserted. This patient died a few days later from massive gastrointestinal haemorrhage.

Another patient who presented with total dysphagia died following oesophagoscopy and dilatation and necropsy revealed that death was due to aspiration pneumonia.

There were five deaths following surgery for benign oesophageal stricture:

- 1 Massive gastrointestinal tract haemorrhage following insertion of Mousseau-Barbin tube
- 1 Bronchopneumonia } following
- 1 Anastomotic leak } oesophagogastrostomy
- 1 Acute gastric dilatation } following jejunal
- and haemorrhagic gastritis } segment
- interposition
- 1 Aspiration pneumonia due to inhaled vomit.

There was a total of five deaths in the 100 patients treated (5% mortality).

The only other complication in the immediate postoperative period resulted from a small leak of gastric juice at an oesophagojejunal-gastric anastomosis. This caused an empyema which was drained, and the patient ultimately was discharged home swallowing normally.

FOLLOW-UP

Of the 50 patients operated on two were lost to follow-up. Both patients had an oesophagogastrostomy. The total number of oesophagogastrostomies followed up was therefore 41. Ten (25%) of these subsequently developed dysphagia due to stricture formation at the anastomosis. All required further oesophagoscopy and dilatation at intervals ranging between three months and two years. It was noted invariably to be much easier to dilate these secondary strictures than the original stricture.

Pyloroplasty was not performed following oesophagogastrostomy and total vagotomy because gastric stasis was not considered a common occurrence. This view is supported by Collis (1965) and Ward and Collis (1971). Despite this, eight (16%) patients who subsequently developed dysphagia were shown by barium studies to have obstruction at the pylorus. Six of these patients also developed secondary strictures at the anastomosis. In all these cases the stricture was dilated

TABLE VI
HISTOLOGY RESULTS IN 50 CASES

Chronic superficial oesophagitis	33
Peptic ulceration in ectopic gastric mucosa	13
Oesophageal scarring associated with enlarged T.B. glands	2
Squamous-cell carcinoma developing in a benign stricture	1
No histology available	1

and a Heinecke-Mikulicz pyloroplasty was performed and the patients' symptoms settled. Subsequent barium studies revealed a normal passage of contrast through the oesophagus and a rapid emptying of the stomach.

PATHOLOGY

Of the 50 cases operated on, 48 were due to strictures of the lower end of the oesophagus. In one case the stricture was in the middle third of the oesophagus. In the remaining case (a double stricture due to an acid burn) no histology was available.

The results indicate that there are two common types of lesions. The commonest is a chronic superficial oesophagitis (Sandry, 1962) characterized by irregular, shallow ulceration and associated with oedema, fibrosis, and inflammatory cell infiltration in the wall of the oesophagus. The other is a localized ulceration in gastric type mucosa in the lower oesophagus (Barrett, 1950).

One example of malignant change (squamous-cell carcinoma) occurring in a previously benign stricture is reported. This patient originally had a hiatus hernia repaired through a transthoracic approach. Subsequently she developed dysphagia and a barium meal revealed a stricture of the lower third of the oesophagus. This was dilated and a biopsy obtained at the time revealed chronic superficial oesophagitis. The patient presented at intervals for dilatation and a biopsy obtained one year after her first dilatation revealed squamous-cell carcinoma. We consider this to be a malignant change arising in a previously benign stricture; however, we cannot categorically exclude the possibility that the lesion may have been malignant initially.

DISCUSSION

Our review of 100 cases of benign oesophageal stricture indicates that 85% of patients are over 60 years of age (average 69) and that females are more commonly affected than males (2.4:1). It is well recognized that young people may also be affected by the disease. A condition of congenital short oesophagus and stricture formation in children

due to gastric reflux has been well documented (D'Abreu *et al.*, 1971).

The commonest cause of oesophageal stricture appears to be the neglected hiatus hernia. Collis (1965) claims that the reflux of gastric juice is one of the most important factors in producing peptic stricture of the oesophagus. Mearns Milne (1967) states that delay in surgical treatment of hiatus hernia may result in oesophageal stricture. Our results support these statements as 89% of patients had a hiatus hernia and complained of dysphagia and indigestion for a period of up to eight years. In view of these results, all patients presenting with a hiatus hernia and symptoms of gastric reflux who fail to settle on a strict medical regimen should be referred for surgical assessment.

Fifty per cent of patients presenting for treatment can be maintained on a strict medical regimen and dilatation. In view of their old age this is certainly the treatment of choice. In another 50% of cases when dilatation is dangerous or impossible, surgery is indicated. Logan (1965), reporting on a similar series of 166 strictures, claims similar results in that dilatation was possible in 80 cases while surgery was necessary in 86.

Oesophagogastrostomy is the simplest operation that can be offered. Of the total operated on, 75% required no further treatment while 25% developed further stricture at the anastomosis and required periodic dilatations.

A large proportion of the patients are old and live alone and have been unable to keep to the strict medical regimen. Often they have discontinued antacids and failed to elevate the head of the bed as recommended. The high proportion of recurrent stricture formation following oesophagogastrostomy, due to reflux of acid, is attributed to failure to adhere to a strict medical regimen.

An attempt has been made recently to reduce the incidence of anastomotic stricture due to reflux following oesophagogastrostomy by fastening the anterior surface of the stomach to the arch of the aorta. This tends to invaginate the lower end of the oesophagus into the stomach and to produce an acute angle of entry. It is, however, too early to evaluate the results of this procedure.

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