increase during the first four weeks than between the 4th and 18th weeks, while in the control group the main increase of range occurred during the later weeks.

Thus, a four-weeks course of oral cortisone would seem to have expedited the relief of pain and the recovery of mobility in the shoulder and decreased the number of patients requiring manipulation.

The behaviour of individual patients differed greatly. Although several patients in the cortisone group appeared to improve remarkably during the first week of treatment, at least one patient was completely unrelieved by cortisone; and in the control group at least one patient improved remarkably, although there were several others who remained unrelieved. Because of this great individual variability none of the separate differences between the cortisone and the control groups reach conventional levels of statistical significance. The apparent differences between the two treatment groups might have been related to their differing sex composition, but it has never been suggested that periartthritis behaves differently in the two sexes, and an analysis of the male and female patients separately showed that their shoulders behaved in a like manner.

Tables III and IV show the effect of manipulation and subsequent re-treatment with cortisone and control suspensions. The control group of 11 patients showed a

TABLE III.—Mean Grading for Pain Following Manipulation

Relation to Manipulation:	Before	After	
		1 Week	4 Weeks
Control group (11 cases) ..	0.8	1.6	1.0
Cortisone group (5 cases) ..	0.9	1.1	0.7

TABLE IV.—Mean Range of Motion in Degrees Following Manipulation

Relation to Manipulation:	Before	After	
		1 Week	4 Weeks
Control group (11 cases):			
Total abduction ..	95	+5	+23 123
Shoulder-joint abduction ..	36	+14	+2 52
" " rotation ..	38	+7	+16 61
Cortisone group (5 cases):			
Total abduction ..	92	+9	+13 114
Shoulder-joint abduction ..	53	+5	+13 71
" " rotation ..	78	+2	+28 108

marked increase of pain in the first week after manipulation, which in many cases had not subsided completely by the fourth week following manipulation; whereas the cortisone group of five patients showed only slight or negligible increase of pain in the first week after manipulation. In spite of these marked differences in pain, the range of movement following manipulation continued to increase slowly and equally in both groups.

Discussion

The findings of this trial would seem to confirm previous clinical impressions that a four-weeks course of cortisone may expedite the relief of pain and the recovery of shoulder-joint mobility in cases of periartthritis of the shoulder, and that its use may reduce the number of patients subsequently requiring manipulation under anaesthesia. Furthermore, in patients who have their shoulders manipulated, cortisone therapy appears to reduce the amount of pain experienced during the first few weeks after manipulation. However, some patients appeared to derive no benefit from cortisone therapy in the dosage used in this trial, and, since none of the separate differences between the control and cortisone groups reached conventional levels of statistical significance, the value of cortisone therapy in periartthritis of the shoulder still remains to be proved. In considering the possible advantages of cortisone therapy in this condition it must be remembered that in the present trial cortisone was compared with an inert medicine, whereas in other recent trials (Medical Research Council

and Nuffield Foundation, 1954) cortisone has been compared with simple analgesics such as aspirin or tab. codein. co.

The one death from coronary occlusion is probably not attributable to cortisone therapy, since there is a known association between periartthritis of the shoulder and coronary disease; and in a recent three-year study of 78 patients with periartthritis of the shoulder who did not receive cortisone, Meulengracht and Schwartz (1952) report seven deaths, though not all of these were due to coronary disease.

Summary

In a series of 32 cases of periartthritis of the shoulder the effects of a four-weeks course of oral cortisone have been compared with those of an inert control medicine.

Cortisone therapy appeared to expedite the relief of pain and the recovery of shoulder motion and to reduce the number of patients requiring manipulation, but there was great individual variation in response to treatment, so that none of the differences between the two treatment groups reached conventional levels of statistical significance.

We wish to thank Mr. John Charnley for help in initiating this trial and for referring many of the patients.

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CARCINOMA OF THE CARDIA

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The diagnosis of carcinoma of the cardiac end of the stomach is notoriously difficult in the early stages and, now that surgical resection via a transthoracic approach is a feasible proposition, it is one which it is more than ever important to make. The chief reason for this difficulty is that patients seldom present themselves until they complain of dysphagia, a state of affairs which signifies that there has been involvement of the entry of the oesophagus into the stomach, or that there is spasm of the sphincter secondary to the lesion. True, the lesion may arise at or very near the cardiac orifice and thus cause the patient symptoms at an early stage, but the diagnosis even then can be extremely difficult to establish by such means as oesophagoscopy and barium x-ray films.

Review of the Literature

Most papers concerning carcinoma of the cardia deal with the radiological aspects and the difficulties in arriving at a diagnosis. Garlock (1941) reiterates these and stresses the frequency of dysphagia, often painful, as the presenting symptom, occurring at whatever stage the cardiac orifice is involved. In addition there may be vague indigestion and loss of weight. He mentions persistent back pain, situated to the left of the spine at about the level of the eleventh or twelfth thoracic vertebra as a late symptom. This was not a feature of the cases in the present series. He presents 15 of his own cases, 13 of which had dysphagia.

Oesophagoscopy definitely established the diagnosis in 14. All 15 cases came to operation, but only five proved to be operable by resection with intrathoracic oesophago-gastrostomy. Two of the five died within a few days of operation, and the other three improved symptomatically but had not been followed up long enough to assess their ultimate outcome.

With regard to the x-ray diagnosis of this condition, Garlock states that in most instances the presence of a tumour will be clearly demonstrated by the usual methods of examination, and that persistence on the part of the radiologist will in most cases demonstrate the growth. This has quite definitely not been our experience, and there is no reason to suppose that the diligence of the radiologists was any less than it should have been.

Numerous other authors discuss the radiological difficulties. They make various points, to be remembered when attempting to detect the presence of a carcinoma at the cardia, but most of them apparent only when the growth has reached a considerable size. These points include, for instance, increase in the distance between the upper pole of the stomach and the diaphragm, a mass visible in the gastric air bubble, dilatation of the lower oesophagus, rigidity of the lesser curvature side of the cardia, etc.

Kinsella (1949) reviewed 10 cases, of which only one had been recognized radiologically. Some of the others had repeated barium meals which were reported as normal. He gives details of his radiological technique and stresses the importance of examination in the supine position, in the anterior, posterior, and lateral planes.

Allison and Borrie (1949) reviewed from the point of view of treatment and prognosis a series of 310 patients with malignant obstruction at the gastro-oesophageal junction who had been treated at Leeds. They condemn gastrostomy and jejunostomy on the ground that they do not relieve the patient's distress, and consider dilatation of the stricture and insertion of a Gouttar tube to be much more satisfactory. They suggest that carcinoma of the stomach should be treated by total gastrectomy and block dissection of the lymphatic bed, including the spleen and the tail of the pancreas. Radical removal was practised only after June, 1942, and 108 of their patients had been subjected to an operation since then. Of these only 24 were suitable for radical resection. Seven of them died post-operatively, and a further three from metastases within seven months of operation. The remaining 14, alive at the time the paper was written, had survived for periods varying up to 25 months, but the average was only eight months.

Present Investigation

The course of 26 cases of carcinoma of the cardia at St. Thomas's Hospital during the past few years is reviewed, and the very high incidence of dysphagia as a presenting symptom is noted, in addition to the difficulties involved in establishing the diagnosis at a stage early enough for complete and successful surgical resection. Nearly all the cases were proved histologically to be adenocarcinomata. Cases which proved to be squamous-cell carcinomata have been excluded, as they were thought to be primarily oesophageal.

Age and Sex.—The 26 cases comprise 15 men and 11 women. There was a difference in the average ages for the two groups, that for men being lower than for women—57 against 65. The age spread for men was 40 to 73, and that for women 43 to 73.

Symptoms.—The duration of symptoms before attending hospital was very variable, ranging from seven weeks to one year, but was most often between two and six months. We would stress that a history of many months is by no means uncommon, as in Case 1. The relative frequency of the main symptoms on first attendance was as follows: dysphagia, 24 cases; regurgitation, 21; pain on swallowing 12; constant pain, 4; loss of weight, 23; frank haemorrhage, 1 (but 2 more later had haematemesis).

Dysphagia (Cases 2 and 3).—Of the 26 patients, 24 complained of food sticking in the lower sternal region; the disability was worse for solids than for liquids. Often pain was felt at the same time, and regurgitation gave immediate relief. In three patients the dysphagia was curious in that it was related to posture; in two of these food stuck more completely in the erect posture or when leaning forwards, whereas it was greatly relieved when they were lying on their backs; and, indeed, one patient (Case 6) had adopted this position for his meals. In the third patient dysphagia was relieved by leaning forwards. In our view postural dysphagia is pathognomonic of a neoplasm of the fundus of the stomach.

Pain.—The commonest type of pain is one which is felt on swallowing in the xiphisternal or retrosternal regions (Case 4), and may radiate to the right or left costal margins, the left breast, or either scapular region. It is not felt apart from swallowing. This pain seems to be identical to the pain so commonly felt by patients with hiatus hernia and free-reflux oesophagitis, and we would ascribe its origin to a similar cause—that is, lower oesophageal inflammation. In some cases an entirely different pain is present, as in Case 5. It is constant and unrelated to meals or swallowing, and may be quite continuous, though in one case it was felt only at night. Its situation is similar to the foregoing pain. In our experience it is very suggestive of a neoplasm involving the lower oesophagus. Three of the four patients who complained of this pain had at operation undoubted involvement of the mediastinal structures adjacent to the lower oesophagus. Garlock stated that pain which was felt in the back to the left of the eleventh and twelfth thoracic vertebrae was a not uncommon symptom in his cases, but we have not met it in any of ours.

Indigestion.—Although in a large number of cases the lesion must have been present for many months before involving the cardiac orifice, with consequent dysphagia, it was unusual for there to be any preceding history of indigestion.

Appetite.—Appetite was generally well maintained, and several complained of hunger but were afraid to eat because of painful dysphagia.

Examination.—Findings on clinical examination were generally very few, other than some evidence of loss of weight. A mass was palpable in the epigastrium in only six cases.

Radiology.—Before discussing the radiological diagnosis it would be well to consider certain points. Firstly, the obstruction at the cardia may be complete enough to prevent barium from entering the stomach in sufficient quantity to outline the fundus satisfactorily, and this may be present when the neoplasm is still small, so that, although the fundus is filled, no satisfactory proof of a filling defect is obtained. The obstruction may produce an appearance identical to that seen in primary achalasia (Cases 3 and 6, and Figs. 4 and 5), or even "corkscrew" lower oesophagus—for example, Case 1 and Fig. 2. Thus in the absence of any other demonstrable abnormality the true diagnosis may be missed. Secondly, as there is a partial obstruction at the cardia the "hun-

FIG. 1.—Carcinoma of the cardia, showing narrowed segment eccentrically placed in relation to the oesophagus, with irregularity of the stream of barium beyond.

gry" stomach may pass the barium through the pylorus into the upper intestine so rapidly that a sufficient residue is not obtained to get an adequate outline of the fundus.

If these difficulties are taken into account, the main findings at a barium meal which will suggest the diagnosis of a neoplasm of the fundus involving the cardia are: (1) An irregular filling defect at the oesophago-gastric junction, which may, however, be indistinguishable from a primary lower oesophageal growth. (2) Deformation of the fundus gas shadow by a large neoplasm, but it must be remembered that the outline of this gas shadow is often irregular, especially where the rugal folds are heavy. (3) An irregularity or splitting of the stream of barium as it passes through the cardia, or a narrowed segment at the cardia which may be placed eccentrically in relation to the distended oesophagus (Fig. 1). This may produce the appearance of a "fixed shelf" in this region. (4) "Half shadowing" at the shoulder of the narrowed segment.

Radiological investigation with barium revealed the true cause of the obstruction in 18 patients, in the others (except for one, who was not x-rayed) there was obstruction at the lower end of the oesophagus, but the appearances were reported as those of achalasia of the cardia or just "narrowing" rather than neoplasm.

Oesophagoscopy.—Oesophagoscopy was at times equally misleading or uninformative, as in Case 7. It was performed in only 16 of the cases, and showed a carcinomatous obstruction at the lower end of the oesophagus in 11 of them; in these biopsy confirmed the diagnosis. In one of the other five oesophagoscopy was performed twice with an interval of 11 weeks, and appeared quite normal on each occasion, despite the fact that the patient complained of continued dysphagia. In another the oesophagus and cardia appeared normal, but bougies passed through the cardia were gripped by some obstructing lesion beyond. In three others an obstruction was found at the lower end of the oesophagus, but no definite evidence of carcinoma was seen, and it was thought more likely to be due to achalasia than to a neoplasm. It is interesting to compare these results with those of Garlock's series, in which oesophagoscopy definitely established the diagnosis in 14 out of 15 cases. Estimation of the gastric acidity was attempted in only a few cases, and usually the obstruction made it impossible.

Case 1

An electrical engineer aged 49 attended hospital on July 31, 1950, complaining of increasing difficulty in swallowing for one year. Food seemed to stick in the suprasternal notch. There was no pain and the difficulty was greater for solids than for fluids. He had lost a few pounds in weight, and had recently regurgitated his food. There were no relevant findings on clinical examination.

FIG. 2.—Case 1. "Corkscrew" lower oesophagus with a filling defect in the fundus.

Barium x-ray examination showed obstruction in the lower third of the oesophagus, with dilatation above this level. This part had a "corkscrew" outline, and the appearance of the mucosal folds suggested the presence of

stomach above the diaphragm. In the fundus of the stomach there was an irregular filling defect, the appearances of which suggested a neoplasm (Fig. 2).

He was put on a semi-solid diet and was observed as an out-patient. He improved symptomatically to a great extent, but when seen on December 4 he appeared to be extremely pale and was admitted the same day. He had suffered a head injury at work three weeks previously, following which he had lost three pints (1.7 litres) of blood or more (his estimation) from the scalp laceration. Apart from this he had spat up a mouthful of blood on two occasions a week previously. He denied frank melaena.

His haemoglobin was 20%. No abdominal mass was palpable. Following blood transfusion, oesophagoscopy was carried out. At 35 cm. an ulcerated stricture was seen, the lumen of which was 2 mm. in diameter. On the posterior wall just above the stricture was an area of erosion which bled easily. Gastric contents were seen to regurgitate, and the macroscopic appearances were reported as being those of reflux oesophagitis with stricture formation. Histological examination of the biopsy specimen obtained, however, showed the appearances of a moderately well differentiated adenocarcinoma.

The patient was found to have a histamine-fast achlorhydria. He was advised to continue with his semi-solid diet, and so long as he did so his dysphagia hardly troubled him. Observation was continued on him as an out-patient, but recurrent haematemesis necessitated his admission on two occasions for blood transfusion.

On March 29, 1951, thoracotomy was carried out. He was found to have pleural secondaries from a large growth involving the lower 4 in. (10 cm.) of the oesophagus and the fundus of the stomach. Even a palliative operation was regarded as out of the question.

He recovered fairly well from the operation, and was discharged again. He was finally admitted on June 3, 1951, with complete oesophageal obstruction and a left pleural effusion. He died on June 25.

At post-mortem examination there was a mass of growth filling the upper third of the stomach, spreading up the oesophagus. A mass of secondary growth surrounded the aorta and oesophagus just above the diaphragm. The liver contained numerous metastases, and a mass of growth had infiltrated the wall of the portal vein in the middle of the gastro-hepatic omentum and had extended along its lumen to its bifurcation.

Case 2

A housewife aged 43 was admitted in October, 1950, complaining of epigastric pain for four months which had

gradually become worse. It came on any time, and was unrelated to meals or swallowing. It was aggravated by stooping and relieved by lying down. She also noticed that food, particularly solids, seemed to stick in the xiphisternal region, and she complained of vomiting. She had lost weight.

On examination there was a slight tenderness in the epigastrium, but no mass was palpable. A barium swallow showed some hold-up at the lower end of

FIG. 3.—Case 2. Obvious filling defect at the lower end of the oesophagus and cardia.

the oesophagus, and a filling defect at the cardia was visible (Fig. 3). She was found to have a histamine-fast achlorhydria. No oesophagoscopy was performed.

At thoracotomy the oesophagus appeared normal, but a hard mass was palpable through the diaphragm in the stomach. It occupied the lesser curvature and was fixed posteriorly. The growth was considered irremovable, but the fundus of the stomach was brought up through the diaphragm and anastomosed to the side of the oesophagus. After operation her swallowing was much improved, but her convalescence was interrupted by a recurrent left pneumothorax.

She was discharged four weeks after operation, but was admitted to another hospital following a haematemesis. She was reported to have metastases in the liver. She went steadily downhill and died on April 3, 1951, nine months after the onset of symptoms and five months after operation. No post-mortem examination was made, and thus the histology of the tumour was not determined.

Case 3

A photographic mechanic aged 46 was admitted on October 1, 1951, complaining of having had for ten weeks a burning pain under the lower end of his sternum on swallowing. This became progressively worse, and food seemed to stick in this region. The difficulty was eased slightly by leaning forwards. He did not regurgitate his food, but he would sometimes bring up some watery material after swallowing. He had lost about 14 lb. (6.4 kg.) in weight in three months.

Examination was unrevealing except that some weight loss was apparent. No abdominal mass was palpable and there was no tenderness. A barium swallow, repeated on

three occasions, showed only the appearance of achalasia of the cardia, unaffected by octyl nitrite but slightly relaxed by leaning the patient forwards (Fig. 4).

Oesophagoscopy was not performed. His condition deteriorated rapidly, and it was thought that he must have a carcinoma of the fundus of his stomach involving the cardia. Accordingly, through a left thoracotomy inci-

FIG. 4.—Case 3. Obstruction in the lower oesophagus originally reported as showing the appearance of achalasia only.

sion, oesophago-gastrostomy was performed. A large carcinoma was found to involve the lower part of the oesophagus and aorta, fundus, and posterior wall of the stomach, and was too extensive for removal. No biopsy was taken as it was thought that this would lead to haemorrhage or spread to the pleural cavity.

The immediate post-operative period was satisfactory, but he died at home on January 9, 1952. Necropsy was not performed.

Case 4

A police constable aged 40 was admitted to another hospital on August 25, 1952. He had for about three years been troubled with indigestion, which had consisted mainly of belching, but three months before admission he began to notice a high retrosternal pain on swallowing which would be immediately relieved by vomiting all the food he had just eaten.

A barium swallow showed dilatation of the lower third of the oesophagus, with a large irregular filling defect at

its lower end. The appearances were those of a carcinoma which appeared to be involving the fundus as well.

Oesophagoscopy showed a bleeding ulcer at the level of the diaphragm. Biopsy proved this to be an adenocarcinoma of the stomach. He was transferred to St. Thomas's Hospital on September 12 for radical resection of the growth. This was performed on September 22, and almost the entire stomach from just proximal to the pylorus and the lower part of the oesophagus to a point well above the growth, including the adjacent diaphragm, spleen, and tail of the pancreas were removed. The gut was reconstituted with an end-to-side oesophago-jejunostomy.

The growth arose from the fundus of the stomach and ulcerated out the posterior wall of the lower part of the oesophagus. On microscopy it was seen to be a well-differentiated tubular columnar-cell carcinoma. No carcinoma was seen in any of the lymph nodes removed.

He made an uneventful recovery from the operation and was discharged in good general condition on October 24, and he was still alive at the time of writing, one year later.

Case 5

A labourer aged 60 was admitted on June 10, 1949, having for two months vomited immediately after eating. He noticed difficulty with swallowing and complained of an aching lower sternal pain, which occurred any time and was not related to food. It radiated to the interscapular region. He could manage fluids better than solids. He had lost about 28 lb. (12.7 kg.) in weight.

Apart from his thinness, there were no abnormal physical signs and no mass was palpable in his abdomen. A barium swallow showed no hold-up in the oesophagus, but the cardia did not look normal, and the radiologist was suspicious of the presence of a carcinoma.

At oesophagoscopy a friable growth was seen at 40 cm. A bougie was passed without difficulty. No biopsy was taken.

Operation was then performed. Through a thoraco-abdominal approach the growth, about the size of a tangerine, was identified in the fundus of the stomach near the cardia. The oesophagus up to 2 in. (5 cm.) above the growth, the entire stomach, and the spleen were removed and oesophago-jejunostomy was performed. On opening the stomach a thick ulcer 4.5 cm. in diameter was found at the cardia and spreading up in the lumen of the oesophagus. On section it proved to be a well-differentiated cuboidal and columnar-cell carcinoma.

The patient recovered uneventfully from the operation and was discharged from hospital three weeks later. His swallowing was normal, and he was symptom-free except that he had to eat small meals. A barium swallow showed a satisfactory anastomosis.

He remained well for a further three months, when he began to get various pains, mostly in relation to the lower part of his spine. He continued to swallow well. X-ray examination of his spine showed no bony abnormality, but he was given a course of radiotherapy to the sacral region. He was only slightly improved as a result of this, and went steadily downhill. His swallowing was unsatisfactory, and a barium swallow showed no evidence of local recurrence. He died at home on February 9, 1950. Necropsy was not performed.

Case 6

A butcher aged 56 was admitted on July 21, 1952. He complained that for ten weeks he had noticed food sticking in the xiphisternal region. The dysphagia had increased and at the time of admission the obstruction was almost complete. The difficulty was lessened if he lay on his back, so that he had adopted this position for his meals; it was much worse if he leaned forwards. He had been regurgitating most of his food, and had lost about 42 to 56 lb. (19 to 25.4 kg.) in weight.

He was slightly tender in the epigastrium, but no mass was palpable. A barium swallow showed what appeared

to be a spasm at the lower end of the oesophagus. It was not possible to examine the stomach, as not enough barium entered it (Fig. 5).

Oesophagoscopy showed an obstruction at 40 cm. which had the appearances of achalasia, though the possibility of carcinoma of the fundus of the stomach was considered. Thoracotomy was carried out on July 31, and he was found to have a carcinoma of the fundus of his stomach, with hard metastases in lymph nodes round the coeliac axis and pylorus. There did not appear to be either any oesophageal spread, or hepatic or peritoneal metastases.

FIG. 5.—Case 6. Carcinoma of cardia. X-ray appearances reported as being those of spasm.

the operation it seemed that the anastomosis was leaking. His condition deteriorated, and he died on August 6.

A post-mortem examination was not carried out, but the microscopical appearances of the tumour removed at operation were those of a well-differentiated adenocarcinoma.

Case 7

A man of 62 was admitted on September 3, 1951. He complained of dysphagia for 10 weeks and of the loss of 28 lb. (12.7 kg.) in weight.

No abnormality was found on clinical examination and oesophagoscopy on September 5 was normal to 40 cm. A barium swallow showed a hold-up at the cardia, the appearances of which were those of spasm rather than new growth.

He was discharged, but was readmitted for further oesophagoscopy on November 23. Again the oesophagus appeared normal, though possibly slightly dilated. The oesophagoscope passed into the stomach without hindrance, and no lesion was seen in the first 1½ in. (3.8 cm.) of stomach. A further barium swallow again showed obstruction at the cardia, and it was thought that the appearances were those of a neoplasm of the fundus involving the cardiac orifice. A histamine test showed complete gastric achlorhydria.

On December 12 a laparotomy was carried out. A large neoplasm of the cardiac end of the stomach, which was invading the diaphragm, was found. It was not considered operable, and a gastrostomy was performed.

He was discharged from hospital on January 10, 1952, and was seen as an out-patient two weeks later. Though asked to return after a month he did not do so.

Discussion

It is not part of our intention to discuss treatment or prognosis, as these are fully dealt with in other reviews, but we concur with the uniformly depressing picture there present. However, we wish, by considering the clinical and radiological aspects of the disease, to stress important diagnostic features, close attention to which will suggest the diagnosis earlier in the course of the illness. Unfortunately, the growth is usually completely silent until dys-

phagia occurs and indicates that the gastro-oesophageal junction has been involved. Even then it is quite a step from this presenting symptom to ultimate diagnosis and one with many pitfalls, as both radiology and oesophagoscopy can be misleading.

It is essential not to attach too much weight to a negative x-ray report, as even with the utmost perseverance the radiologist may be unable to demonstrate the growth. There is, unfortunately, no secret of success. The physician must from the history suspect the diagnosis and inform the radiologist of his suspicions, and the radiologist must always bear in mind the possibility when investigating any case of dysphagia resulting from an obstruction at the lower end of the oesophagus, where there is no apparent cause for it. "Achalasia" in anyone past middle life must be especially suspect. The smaller the lesion the harder it will be to diagnose.

Summary

A series of 26 cases of carcinoma of the cardiac end of the stomach is presented. Symptoms, radiology, and results of oesophagoscopy are discussed.

The prominence of dysphagia as the presenting symptom is due to the fact that the growth is usually silent until the gastro-oesophageal junction is involved.

Even the most careful radiology may fail to reveal the stomach carcinoma as the cause of the obstruction at the lower end of the oesophagus, and oesophagoscopy may at times be misleading.

Largely as a result of this tardiness of the lesion to declare itself, and partly because the significance of the symptoms in middle-aged patients is still not clearly recognized, the results of surgical treatment are extremely bad.

We are indebted to the members of the staff of St. Thomas's Hospital for allowing us to include their cases in this series; to Dr. J. W. Pierce for advice about radiology; and to Mr. K. G. Moreman for the x-ray photographs.

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As part of its policy of studying the needs of old people, the Nuffield Foundation has asked Mr. F. LE GROS CLARK to make studies of the factors affecting continued employment of elderly workers. By permission of the London County Council, the first study was carried out in the maintenance depots of its Housing and Valuation Department, and a report has been published on the findings in 320 of the department's ageing maintenance workers. It is hoped to follow this with a series of inquiries in other industries. The purpose is to find out, if possible, what actually happens to men as they age under various industrial conditions—in building, transport, mines, etc. In the study now reported the conditions were very favourable for the retention of elderly craftsmen and labourers, because in the immediate post-war years many of the local authorities had some difficulty in securing young labour for their building staffs. Most of the 320 men studied were traced from the age of 60 down to the end of their working lives as building employees, though some of them may possibly have found further employment. They were all on maintenance and repair work; and this is usually to the advantage of an elderly man. They were all apparently quite fit for the job as they approached their sixties. But of every hundred men who were fit at 60, not many more than seventy were still fit as building workers by 66 years. After that the decline in numbers through age or ill-health was steady and continuous, so that at 70 years only about thirty of the original hundred men were still in the labour force. Most of the men who remained after their mid-sixties could probably not have stood the pace of work in modern housing construction.