Surgical Treatment of the Complications Resulting from Cardiosophageal Incompetence*

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Patients with esophagitis resulting from incompetency at the cardiosophageal junction can be managed medically with amelioration of symptoms. However, persistence of pain and dysphagia with radiographic evidence of progression of the pathologic process demand surgical appraisal. In general, the results have been good when reflux of gastric contents has been prevented by repair of the existing hiatal hernia. However, cicatricial obliteration of the lower esophagus which may result from ulceration, poses a more difficult problem. Attempts to correct this by repair of the hiatal hernia, with or without concomitant bouginage, plastic operations upon the cardia and resection of the stenotic segment with esophago-gastric anastomosis have frequently resulted in failure with resultant severe recurrent stenosis.

In the absence of esophageal scarring, good results can be anticipated from repair of the hiatal hernia. A review of the experience during the past 12 years in 91 patients treated surgically supports this concept. However, when stenosis exists, the outcome has been poor from this and other procedures. For this reason, in eight patients the stenotic esophagus was resected and a segment of colon was used to establish esophago-gastric continuity. It is the purpose of this paper to present our overall results in both of these groups and to emphasize that a colon transplant is a satisfactory method to ameliorate the symptoms due to severe destructive esophagitis from whatever etiologic agent.

Operative Indications and Diagnostic Procedures

Roentgenologic examination was useful in establishing a diagnosis of esophagitis only in the presence of spasm. However, when the disease was more advanced, esophageal ulcer, stricture and shortening of the terminal esophagus could be ascertained. In the main, the diagnosis of esophagitis had to be made by esophagoscopy and biopsy when possible (64 patients).

In the years 1950-1962, 91 patients with reflux esophagitis ranging in age from six to 76 have been treated surgically. Each of these had been on a prolonged medical regimen. Sixty-four had hiatus hernia with demonstrable inflammation or erosion of the lower esophagus. In the remainder, esophageal scarring and contractions were present. Five of the latter group had insufficient radiographic evidence to support a diagnosis of hiatus hernia. No patient suffering from achalasia, cancer or other lesions of the esophagus stomach or duodenum was included in this series.

Operative Procedures and Technique

According to the diagnosis and the patient's general condition, one of four surgical procedures was selected. These included repair of hiatus hernia, bouginage of demonstrated strictures, esophago-gastrectomy and cardioplasty and replacement of the distal esophagus with a segment of transverse colon.

1. Repair of Hiatus Hernia

Sixty-eight patients underwent transthoracic repair of their hiatus herniae. Two had a transabdominal procedure. All but six of these patients were free of demonstrable scarring.


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The operations were performed through the left thorax in the manner described by Allison. The left chest was opened by a long posterolateral incision in the eighth interspace. The distal esophagus was mobilized from the inferior pulmonary vein down to and including the upper end of the herniated stomach after division of the inferior pulmonary ligament and mediastinal pleura covering the esophagus. A counter incision was made in the diaphragm a few centimeters from the hiatus through which the index and middle fingers of the left hand were inserted from the abdomen into the hiatus. In this manner, the sac was delineated, dissected from the stomach and the phrenoesophageal ligaments identified. The stomach and lower esophagus were reduced beneath the diaphragm with the aid of a rubber tissue drain inserted around the cardioesophageal junction, the ends of which were passed through the hiatus and out the counter incision in the diaphragm. Traction upon the drain displaced the gastroesophageal junction into the abdomen.

The phrenoesophageal ligaments were sutured to the undersurface of the diaphragm anteriorly and laterally with interrupted mattress stitches of fine silk and the crura approximated behind the esophagus with mattress sutures of 1-0 silk. These two maneuvers restore the normal angle of His and retain the cardioesophageal junction within the abdomen.

In five patients with a shortened esophagus due to inflammation, it was necessary to create a new hiatus anterio-laterally on the dome of the diaphragm. To accomplish this, one crura was divided and the diaphragm incised outward from the hiatus. In this manner, the stomach was returned to the abdomen and a satisfactory repair of the diaphragm posterior to the cardioesophageal junction accomplished.

2. Esophago-gastrectomy and Cardioplasty

Two patients who had the lower end of the esophagus resected with reconstruction by an esophagogastrectomy and two patients who underwent a Heineke-Mikulicz cardioplasty were observed on the service and are included for comparative purposes.

3. Bouginage

Nine patients with esophagitis and severe scarring were treated with bouginage because existing ancillary pathology precluded major surgical intervention. This was performed with the Jackson-Plummet dilators over a string. In addition, three patients who had a persistent stenosis following hiatal hernia repair were similarly treated.

4. Resection of the Lower Esophagus and Reconstruction with a Segment of Colon

The technique for colon replacement of the esophagus has been previously described. In spite of this, resection of the lower esophagus for stenosis demands special consideration. As a rule, the entire operation can be performed quite satisfactorily through a left transthoracic transdiaphragmatic incision. However, when two operating teams were available, it was found expedient to utilize a separate upper midline abdominal incision together with the left chest incision. In this manner, the transverse colon was mobilized by the abdominal team concomitant with the resection of the esophagus by the thoracic team and the numerous anastomoses easily performed. Considerable operating time was conserved with this method. When this was not feasible, the entire operation was performed by one operating team through the left chest. After mobilization of the distal esophagus, the upper abdomen was entered by incising the diaphragm from the hiatus to the costal margin. The splenic flexure of colon was mobilized by dividing the gastro-colic omentum and the short gastric vessels. Following identification of a satisfactory nutrient artery and vein to the colon segment and assurance that the mesentery was of sufficient length to transpose the bowel into the thorax, the colon was transected proximally and distally on both sides.

The mesentery was divided to the base of the vascular pedicle of the transplant and the latter transposed into the chest.
Although we have felt that the bowel should be inserted in an isoperistaltic manner because of symptoms of nocturnal regurgitation and sour eructations in three of our earlier patients, recent cinefluorography studies support the concept that inherent colonic peristalsis is dissipated within time after transplantation. In any event, it is mandatory that the interposed colon lie in a comfortable position without tension or torsion of its pedicle, whether it is inserted iso- or antiperistaltic.

The diseased lower esophagus was resected and the opening in the stomach closed. The isolated colonic segment with an intact venous and arterial blood supply was then interpolated between the esophagus and a new opening on the anterior surface of the stomach. A three layer anastomosis with interrupted fine silk sutures has been employed to unite the esophagus and the segment of colon. After reconstituting the transverse colon, a new diaphragmatic hiatus was fashioned about the colonic segment to prevent herniation of the stomach and small bowel into the chest. A No. 20 Foley catheter was inserted into the stomach for postoperative gastric decompression and subsequent feeding. The end of this tube was brought out through a stab wound in the left upper quadrant before the diaphragm was completely closed.

### Results

The results of the operations were classified on the basis of the clinical status of the patient, the existence or nonexistence of spasm, ulceration or stenosis, and, finally, upon direct endoscopic observation when necessary. Each patient has been examined at intervals in the outpatient department of Cleveland Metropolitan Hospital or in the office by one of us and each had an x-ray examination of the esophagus and stomach at least once following operation. The average period of followup has been more than four months in every case and as long as 12 years in some. All patients have been seen in the past 18 months.

In order to be considered a good result, it was necessary that the patient maintain a satisfactory state of nutrition and be free of dysphagia, substernal pain or sour eructations. In addition, it was mandatory that patients with cicatrix and stenosis of the esophagus prior to operation be entirely asymptomatic. Further evidence of stenosis or regurgitation by x-ray was considered to be poor even if unaccompanied by acute symptoms. The presence of esophagitis by esophagoscopy in any patient caused the result to be classified as poor.

In Table 1 is depicted a summary of the results of 91 operations upon 88 patients. A repair of the hiatus hernia was performed upon 64 patients in whom cica-

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Table 1
Operative Results
tricial stenosis was not present. Fifty-three (80 per cent) have had a good result according to the standards previously described. They have been symptom-free without evidence of recurrence. Three have had demonstrable recurrence of the hernia, but are asymptomatic and do not have esophagitis or spasm by x-ray examination. In two of these patients, the repair was performed through the abdomen. They are classified as obtaining a fair result. Seven patients have been classified as obtaining a poor result. In two of these, stenosis progressed and upper gastrointestinal bleeding occurred following the hernia repair, necessitating a colon replacement. The others continue on a medical regimen. The only death in the group was due to a ruptured aortic aneurysm on the sixth postoperative day.

Twenty-seven operations were performed upon patients with evidence of scarring of the esophagus prior to the procedure. In six, a repair of the hiatal hernia was undertaken in an attempt to ameliorate the esophageal disease. In only one individual can the result be considered good. Three patients require intermittent endoscopic bouginage for relief of their recurrent dysphagia. Persistent dysphagia, ulceration and esophageal bleeding in two patients necessitated resection of the esophagus and colon interposition.

In nine patients on whom operation was deemed inadvisable, bouginage has been continued. Three have relief of dysphagia and pain from periodic dilatation while the remaining six individuals continue to lose weight. Tube feeding gastrostomy for dietary supplementation was done in two of the latter group.

Four persons have had revision operations either at the cardioesophageal junction or resection of the distal esophagus with esophagogastrostomy. A Heineke-Mikulicz type of procedure was carried out in two patients early in this series. Esophagitis promptly recurred requiring frequent bouginage for relief of obstruction. One of these patients died in the interim of intercurrent disease and the other was managed by resecting his esophagus and inserting a segment of colon to re-establish esophago-gastric continuity. The two individuals with an esophagogastrostomy are still undergoing periodic dilatations over a string for their stenosing esophagitis. Advanced age and heart disease prevent resection and a colon transplant.

A segment of transverse colon was utilized to replace the stenotic esophagus in eight patients. There has been no mortality either at operation or subsequently in this small group. In five persons in whom the colon was intercalated in isoperistaltic manner, the results have been good. However, one patient, five years after esophageal replacement with the colon, experienced acute dysphagia after eating an apple. Esophagoscopy yielded large pieces of apple impinging at the esophago-colon anastomosis. These were removed with relief of symptoms. It is of interest that the anastomosis was widely patent freely admitting a large Jesberg esophagoscope. There was no evidence of esophagitis or colitis. In addition, just prior to this episode, cinefluorographic studies had shown unimpeded flow of barium through the esophago-colon segment into the stomach. In view of the paucity of obstructive symptoms both prior and subsequent to this singular episode, it was assumed that the apple was not masticated properly.

All show normal esophageal function on x-ray examination. Three others have been esophagoscoped recently, the esophagus and colon mucosa appearing normal as far as visualized.

In three patients, the colon segment was placed in an antiperistaltic position between the esophagus and stomach because of failure to isolate a long enough segment proximal to the middle colic vessels. The results have to be classified as fair despite lack of pain or dysphagia, for each experiences nocturnal regurgitation of gastric secretions in the mouth. One required a revision of the anastomosis between the colon and
the stomach. It was believed that this was due to faulty technique at the original surgery. However, the microscopic sections of the gastric and colon mucosa demonstrated evidence of inflammation. Grossly this was not manifest and clinically there are no suggestive symptoms. All of these patients have maintained a reasonable dietary intake and have not lost weight. There is no evidence of esophagitis on x-ray film or esophagoscopy.

To illustrate certain of the results described, the following cases are given. All of the patients who underwent colonic interposition have been reported in detail elsewhere. Two will be represented here inasmuch as interval findings are germane to this presentation.

Case 1. (Fig. 1) Six Years' Follow-up in Colon Replacement of Lower Esophagus for Stricture

A six-year-old child was admitted to the hospital on October 19, 1953, following ingestion of muriatic acid. Severe respiratory distress necessitated a tracheostomy following which he was placed on cortisone and antibiotics. Barium swallow demonstrated a normal esophagus with evidence of pyloric obstruction and gastric reflux. A Billroth I gastric resection was performed to alleviate the persistent vomiting. After this procedure, he was relieved only temporarily, intermittent vomiting occurred and dysphagia supervened. X-ray examination revealed narrowing of the lower esophagus. Repetitive esophagus dilations were necessary in order for him to eat. Despite this, on several occasions an emergency esophagoscopy was necessary to remove a bolus of food in the lower end of the esophagus. In June, 1955, x-ray studies of the esophagus and stomach showed 90 per cent gastric retention at

Figure 1: Colon transplant six years following implantation for stricture.

Figure 2: Narrowing of the lower esophagus with an ulcer. Satisfactory amelioration of symptoms and healing of ulcer by transthoracic repair of the hiatus hernia.
the end of six hours. For this reason, a revision of the gastroduodenostomy was performed at St. Alexis Hospital. Although the lower end of the esophagus was narrowed, it was felt that with adequate drainage to the stomach, the pathologic process in the esophagus might abate.

However, intermittent vomiting and dysphagia persisted so that a resection of the esophagus was considered mandatory. On July 12, 1956, at Cleveland Metropolitan General Hospital, the lower end of the esophagus was removed and a segment of right transverse colon was used to reconstruct the esophagus.

He remained entirely asymptomatic, gaining 50 pounds in weight, until September 22, 1961. At this time, he was admitted to Fairview Hospital because of pain in the chest and inability to swallow even liquids. The symptoms began a few hours before admission after ingestion of an apple. Esophagoscopy yielded large pieces of apple which were impinged at the esophago-colon anastomosis. There was no evidence of inflammation in this area either in the esophagus or the colon segment. A large Jesberg esophagoscope was readily passed through the anastomosis which was easily discernible. He has remained asymptomatic since that time. It is of interest that cinefluorography a few months prior to this singular episode demonstrated an entirely normal esophagus, colon segment and stomach.

**CASE 2.** (Fig. 2) *Hiatal Hernia with Lower Esophageal Ulcer*

Mrs. H. S., a 48-year-old white woman was first seen at Polyclinic Hospital in February, 1962. Barium swallow demonstrated the presence of a moderate-sized hiatus hernia with a questionable ulcer in the lower esophagus. The latter was confirmed by esophagoscopy. On February 22, 1962, a transthoracic repair of the hiatal hernia was performed. A marked amount of inflammation existed between the lower esophagus and the aorta, but the wall of the esophagus was not rigid. For this reason, it was felt that a repair of the hernia should suffice. This was done without undue difficulty and except for early postoperative dysphagia, she has been entirely relieved of her prior lower chest pain.

**CASE 3. Carcinoma of the Esophagus Developing in Recurrent Stricture of the Esophagus 17 Years Following Esophagogastrectomy for Stricture of the Esophagus**

J. R., a 67-year-old white man, was seen at Polyclinic Hospital in February, 1962, complaining of difficulty in swallowing. He stated that he had been operated upon at Crile Veterans Hospital 17 years ago for a stricture of the lower esophagus. Since that time, he had undergone repeated esophageal dilations to alleviate a recurrent stricture. X-ray films of the upper gastrointestinal tract demonstrated a complete obstruction of the thoracic esophagus at level of the ninth thoracic vertebrae. At the end of two hours, no contrast medium had passed into the distal esophagus or stomach. His past history revealed that 18 years before, he had a resection of the lower esophagus for a benign stricture (leukoplakia) with an esophagogastrectomy. One year later, pyloric obstruction due to a duodenal ulcer necessitated a subtotal gastrectomy with a gastrojejunostomy at this time. A tube feeding gastrostomy or jejunostomy was deemed necessary. Under local anesthesia, a mushroom catheter was inserted into the efferent jejunum. Injection of contrast media through this tube confirmed the existence of a partial gastrectomy with majority of the fundus displaced into the thorax resultant from the previous esophagogastrectomy (Fig. 3). Further history revealed that the patient had undergone repeated esophageal dilatations in the ensuing years following his esophagogastrectomy for a recurrent stricture.

Esophagoscopy was performed on February 15, 1962, to delineate the pathologic process in the lower esophagus. The mucosa was markedly edematous, friable and bled easily. A biopsy was obtained which was reported as moderately well differentiated squamous cell carcinoma. His anemia, emaciation and cardiac abnormalities precluded surgical intervention. He was dis-
charged to Crile Veterans Hospital for irradiation and further care.

**Case 4. (Fig. 4) Narrowing of Cologastrostomy with Subsequent Revision.**

Mrs. V. H., a 63-year-old white woman, was admitted to the hospital on April 20, 1959. Previous x-ray films had disclosed in addition to cicatricial esophagitis an ulcer on the lesser curvature of the stomach in juxtaposition to the cardioesophageal junction. Prior extensive medical therapy for the preceding six weeks had failed to show healing. For this reason, it was felt that resection of the lower esophagus and upper portion of the stomach was mandatory. On April 27, a resection of the lower esophagus and upper portion of the stomach was performed through a left transthoracic, transdiaphragmatic incision. Because of the question of malignant changes in the gastric ulcer, the upper one-half of the stomach was removed. A segment of distal transverse colon was interposed in an antiperistaltic manner between the esophagus and distal stomach. In order to accommodate the aperture of the colon, a portion of the stomach was closed separately. A Foley catheter was inserted into the remains of the stomach and brought out through a stab wound in the left upper quadrant. The dia-

...phragm and chest were closed in the usual manner. Her postoperative convalescence was entirely uneventful and she was discharged on the 12th postoperative day. She was seen in the office periodically following surgery at which time she complained of a feeling of food "sticking" in the upper abdomen. On May 22, 1960, she was readmitted to the hospital where an upper gastrointestinal x-ray film demonstrated narrowing of the anastomosis between the colon and the stomach. Because of persistence of the above complaint, on August 31, 1960, a revision of this anastomosis was performed through an upper midline abdominal incision. Grossly both the colon transplant and the stomach looked entirely normal. Biopsy of the mucosa was reported as demonstrating evidence of gastritis and colitis. Her previous symptoms were alleviated by widening the anastomosis and to date she has remained asymptomatic.

**Comment.**

The aim of therapy in the management of patients with reflux esophagitis is prevention of acid-peptic juices from damaging the susceptible esophageal mucosa. That this can be accomplished by a regimen of diet, antacids and weight reduction is undeniable. However, when symptoms persist, surgical intervention should be considered. Over 80 per cent of our patients without scarring or stenosis wherein medical treatment was a failure, have had good results from repair of the hiatal hernia. This is not an argument for repairing all hernias, but it points up what can be accomplished surgically by preventing the gastric juices from reaching the esophagus. The eventual outcome in those who developed ulceration, fibrosis and contracture is different. Some of these people were not only failures of conservative therapy, but undue persistence made their management more complicated.

The persistence of esophageal stricture following repair of the hiatus hernia and the prompt return of esophagitis in patients undergoing esophago-gastrectomy, have prompted abandonment of these procedures. Admittedly, in certain individuals the esophageal stenosis may recede, but this is almost impossible to determine prior to hiatal hernia repair. The fact that only one patient in this series obtained a good
result and in two others a subsequent colon transplant was necessary because of bleeding and persistent dysphagia, would lend support to the concept that a repair of the hernia in itself does not permit regression of the cicatrix in the advanced stages of the disease. The solution of severe cicatrizing esophagitis is not simple. This is attested to by the numerous operative procedures which have been promulgated for its cure. In general, these have been aimed at reducing the acidity in the stomach or reconstituting some sort of valve mechanism to prevent regurgitation. At the present time, sufficient experimental and clinical evidence is available to support the feasibility of interposing a segment of viable bowel between the esophagus and stomach following resection of the diseased segment. From our own results, both in the laboratory and in patients observed up to eight years following colon reconstruction of the esophagus, we believe that the large intestine can serve better as an esophageal substitute than the small bowel. The colonic mucosa is apparently more resistant to acid than is the lining of the jejunum. Although an isolated instance of colonic ulceration with perforation and death following a colon transplant has been reported, our own necropsy examination of the implanted colon in a number of patients for whom the operation was performed for esophageal carcinoma, has shown no evidence of inflammation. However, chronic colitis and gastritis were seen microscopically in one patient in whom a revision of the colo-gastrostomy was performed for partial obstruction. Upon inspection, the mucosa of the colon segment and stomach appeared normal, the foregoing was reported from a biopsy. In addition to frequent clinical observations, cine-fluorographic studies have been performed upon several patients with a colon esophageal substitute. Although free regurgitation of gastric contents from the stomach into the lower end of the colon segment can be observed when the patient is in the Trendelenburg position, these individuals are entirely asymptomatic. There is no question that the esophagus is protected from the injurious gastric juices. Reflux cannot be demonstrated into the esophagus even when the colon has been interpolated in an antiperistaltic fashion. In addition, esophagoscopy in these three patients has shown no evidence of esophagitis, even though they experience intermittent nocturnal regurgitation and sour eructations.

In five patients in whom the transverse colon was implanted isoperistaltically, the results have been good. Except for the singular episode of acute dysphagia in one patient necessitating removal of large pieces of unmasticated apple impinging at the esophagocolon anastomosis, the results have been good. In all, the esophagitis was cured and function has been restored. From these satisfactory results obtained in this small series of patients, one is led to the conclusion that the use of the transverse colon to restore alimentary continuity in patients suffering from obliterative esophagitis may be the procedure of choice.

**Summary**

Patients requiring surgical intervention for unremitting esophagitis due to cardioesophageal incompetence fall into two groups. Good results can be anticipated from repair of the hiatus hernia alone wherein superficial edema and ulceration exist in the lower esophagus. In this group, satisfactory relief of symptoms was obtained in 56 of 64 patients during the past 12 years. By contrast, only one patient obtained a good result when stenosis of the lower esophagus existed at the time of the hernia repair. In five other patients, repetitive esophageal dilatation is necessary to alleviate dysphagia.

Twenty-seven patients known to have cicatricial obliteration of the esophageal lumen were treated. Nine were managed with bouginage because definitive operation was refused or intercurrent disease precluded major surgery, with only three being benefited. The remainder are maintained on an uncomfortable regimen of semisolids.
and intermittent bouginage. All four patients in whom the diseased esophagus was either resected with esophago-gastric anastomosis or a plastic procedure performed at the cardioesophageal junction, the esophagitis promptly recurred. In eight patients, the cicatrix was resected and a viable segment of transverse colon interposed between the esophagus and stomach. There was no mortality in this small group, and all have had relief of esophageal symptoms. Six of the eight were esophagoscoped and each has radiographic studies without evidence of esophagitis, colitis or gastritis.

**Resumen**

Los enfermos que requieren tratamiento quirúrgico debido a esofagitis indomable causada por incompetencia cardioesofágica entran en dos grupos. Se pueden esperar buenos resultados de la reparación de la hernia hiatal solamente cuando hay ahí edema superficial y exacerbar en el esófago inferior. En este grupo, se obtuvo alivio satisfactorio de los síntomas en 56 de 64 enfermos en los últimos 12 años. Contrariamente sólo en un enfermo se obtuvo buen resultado cuando existía estenosis del esófago inferior al hacer la reparación de la hernia.

En otros 5 enfermos se necesitó de la reiterada dilatación del esófago para aliviar la disfagia.

Se trataron 27 enfermos con obliteration del lumen esofágico de naturaleza cicatrizal. Nueve se trataron con bouginas porque la operación fue rehusada y existía una enfermedad intercurrente que hacía inadecuada una operación mayor. Se beneficiaron sólo tres.

El resto se mantienen bajo un régimen inómodo de semisólidos y con dilataciones intermitentes. En los cuatro enfermos en quienes se hizo resección del esófago con anastomosis esofagogástrica y se hizo un procedimiento plástico en la unión esofagogástrica, hubo recurrencia de la esofagitis prontamente. En ocho enfermos la cicatriz se resecó y se interpuso un segmento viable de colon entre el esófago y el estómago. No ha habido mortalidad en este pequeño grupo y todos se han aliviado de sus síntomas de esofagitis. Seis de los ocho de este pequeño grupo se sometieron a esofagoscopy y tienen estudios radiográficos sin encontrar esofagitis, gastritis o colitis.

**Résumé**

Des malades pour qui il était nécessaire de pratiquer une intervention chirurgicale pour oesophagite incurable liée à une insuffisance cardioesophagienne furent répartis en deux groupes.

On peut attender de bons résultats du traitement de la hernia hiatal seule dans laquelle existent un oedème et une ulcération superficielle dans la partie inférieure de l'oesophage. Pour ce groupe, un soulagement satisfaisant des symptômes fut obtenu pour 56 malades sur 64 pendant les douze années passées. Au contraire, un seul malade seulement donna un bon résultat, lorsqu'il existait une sténose de l'oesophage inférieur au moment du traitement de la hernie. Pour cinq autres malades, il fallut des séances répétées de dilatation oesophagienne afin de soulever la dysphagie.

27 malades connus opur avoir une obliteration cicatricielle de la lumière oesophagienne furent traités. Neuf d'entre eux furent soumis à des simples dilatations parce qu'ils avaient refusé l'opération définitive ou qu'une affection intercurrente avait exclu toute intervention chirurgicale importante: trois malades seulement en tirèrent bénéfice. Le reste des malades fut maintenu à un régime inconfortable d'aliiments semi-solides et de séances intermittentes de dilatation. Chez les autres malades pour lesquels l'oesophage atteint fut soit enlevé avec anastomose oesophagogastrique ou une prothèse plastique pratiquée à la jonction cardio-oesophagienne l'oesophagite disparut rapidement. Chez huit malades, la cicatrice fut enlevée et un segment viable du colon transverse mis en place entre l'oesophage et l'estomac. Il n'y eut aucune mort pour ce petit groupe, et tous les malades ont eu un soulagement des symptômes oesophagiens. Sur les huit malades, six furent soumis à l'oesophagoscopy et chacun fut coumis à une surveillance radiographique sans qu'on mette en évidence une oesophagite, une colite ou une gastrite.

**Zusammenfassung**


Es wurden 27 Kranke mit narbiger Obliteration der Oesophagus-Lichtung behandelt. In 9 Fällen wurde mit Bouginierung vorgangen, weil ein entscheidender Eingriff verweigert wurde, oder interkurrente Erkrankung einen größeren

REFERENCES


VALVE REPLACEMENT

An original left atrial approach to the aortic valve has been devised and an operative technique for combined replacement of the aortic and mitral valves has been developed. In their first clinical trial of the method, survival of the patient with excellent early hemodynamic results was obtained. Caged-ball valves provide a relatively simple and indestructible replacement for the aortic and mitral valves. Their effectiveness in the aortic area, however, may be limited by the alteration in blood flow which occurs due to the interposition of a sphere in the fluid stream. The cage of the aortic ball-valve prosthesis has been designed to reduce the danger of thrombus formation. Prosthetic valve replacement remains in the investigative stage and should be reserved for patients with lesions which are not amenable to satisfactory palliative plastic procedures.