Surgical Considerations in the Management of Achalasia of the Esophagus

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SINCE THE classic paper of Barrett in 1949,[1] which reintroduced the Heller procedure, esophagocardiomyotomy has been widely used for the treatment of achalasia of the esophagus. At our institution the modified Heller procedure of anterior esophagocardiomyotomy has been utilized during the past 15 years as the procedure of choice. Sufficient time has now elapsed to evaluate long-term results. While the Heller myotomy has proven superior to other operations, not all patients have had good results. Poor results have been critically evaluated to determine the reason for failure of the operation.

Medical measures and periodic esophageal dilatation have been carried out in most of the patients prior to operation. Only nine have undergone operation without a previous trial of dilatation. A review of this management was made to ascertain if surgical procedures should be reserved for patients in whom dilatation failed or if they should be utilized as a primary method of therapy. It has been our impression that esophagocardiomyotomy has sufficiently corrected symptoms and that the indications for operation should be extended. This review justifies this impression.

Clinical Material

Seventy-three patients who were treated for achalasia of the esophagus at the Vanderbilt University and Nashville Metropolitan General Hospitals were reviewed. Diagnosis was made by symptomatology and roentgenographic findings. Criteria for the diagnosis of achalasia have been defined by Postlethwait and Sealy.[8]

As in other series [5] women were slightly more numerous than men. The youngest patient was 19 years old and the oldest was 85. Most patients were middle-aged; the average age was 50.

Major symptoms were those usually seen with achalasia (Fig. 1). Dysphagia was present in 97 per cent of patients. Seventy-six per cent complained of regurgitation. Weight loss was significant in 67 per cent; the average weight loss was 29 pounds, and one patient had lost 94 pounds. Pain was an infrequent initial symptom, occurring in only 13 patients (18%). When present, pain was burning and localized to the epigastrium or lower sternal area. The average duration of symptoms was 7½ years before initiation of treatment.

Patients Treated by Esophageal Dilatation. Esophageal dilatation was performed in 64 patients. The Browne-McHardy pneumatic bag dilator was used in the majority and is at present preferred. Results obtained from dilatation are seen in Table 1. One-third were failures and required subsequent surgical procedures. Forty-four per cent had a good result from dilatation, and 11 per cent had fair results. Twelve per cent have had poor results, but because of age, other physical abnormalities or re-

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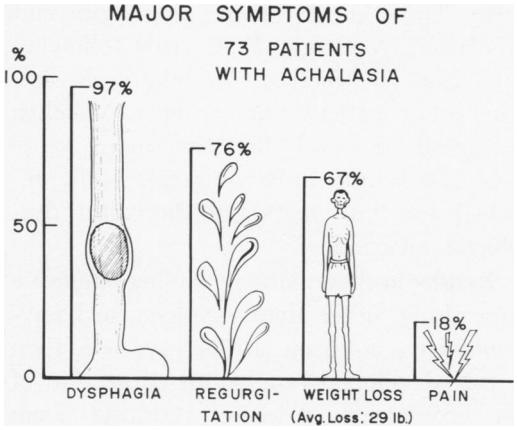

FIG. 1.

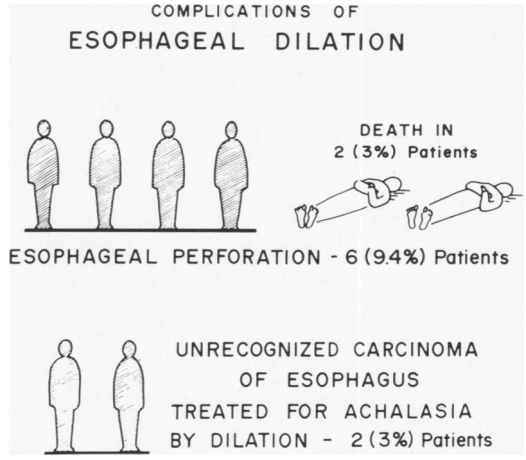

FIG. 2.

fusal of operation have not had surgical treatment.

Included in poor results or in those requiring operation are six patients who sustained perforations of the esophagus during dilatations. This group constitutes 9.4 per cent of the patients undergoing dilatation. These procedures have been carried out by experienced specialists,—an otorhinolaryngologist and a gastroenterologist, in more than 90 per cent of cases and in all six patients sustaining perforation. Two of the six patients died as a result of perforation, a 3 per cent mortality for the treatment of achalasia by dilatation (Fig. 2).

It is well-known that achalasia may be associated with carcinoma of the esophagus. Despite this knowledge, two patients with achalasia were treated by dilatations while their symptoms were caused, at least in part, by esophageal carcinoma. Both died of widespread metastatic carcinoma which was unrecognized until autopsy in one case and until a few weeks before demise in the other. Ellis [2] reported a higher incidence of carcinoma of the esophagus in an unselected series of patients treated for achalasia.

TABLE 1. *Results of Esophageal Dilatation*

	No. Patients	%
Good	28	44
Fair	7	11
Poor	8	12
Failures (requiring surgery)	21	33
Total:	64	100%

Patients Treated by Surgical Procedures. Thirty patients had operations for achalasia. Twenty-two had a modified Heller procedure or anterior esophagocardiomyotomy. Eight were treated prior to 1949 and had operations other than myotomy. Twenty-one patients had previous esophageal dilatations, numbering from one to a high of 60 prior to operation. The usual management has been a trial of esophageal dilatation, and only those whose symptoms persist are referred for operation.

Results in eight patients having operations other than a Heller procedure are shown in Figure 3. Five patients had a Wendel cardioplasty. One, in whom vagotomy and gastroenterostomy were done also, has been followed for 15 years and has an excellent result. The vagotomy and drainage procedure may have protected against regurgitation and esophagitis in the latter patient as all the others who underwent cardioplasty have had poor results from complications of the operation; esophagitis with ulceration, hemorrhage, or stricture have developed. One patient had a resec-

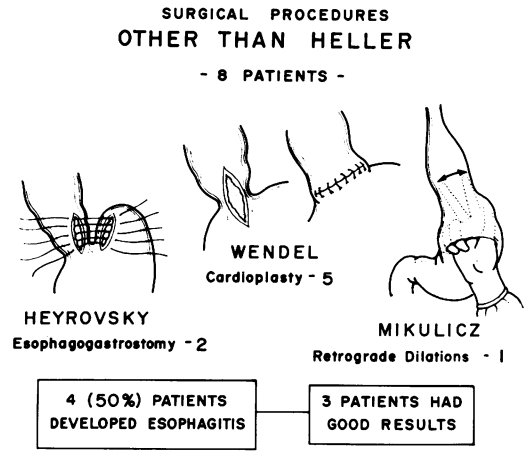

FIG. 3.

tion of an esophageal stricture, vagotomy and pyloroplasty performed seven years after cardioplasty and is now doing well. One patient had a 75 per cent distal subtotal gastrectomy and vagotomy ten years after cardioplasty, but failed to improve and bled again from esophagitis and ulceration. Resection of the esophageal stricture with jejunal interposition was performed in one patient who died. The fifth patient with a cardioplasty underwent resection of an esophageal stricture and interposition of a segment of colon. He also died in the early postoperative period.

Two patients were treated by a Heyrovsky side-to-side esophagogastrostomy. One patient has had a good result for 27 years. The other developed esophagitis and continued dysphagia. Four years following operation she died of Hodgkin's disease. The other patient underwent a Mikulicz retrograde forceful dilatation many years ago. His symptoms were satisfactorily relieved for four years but thereafter dysphagia recurred.

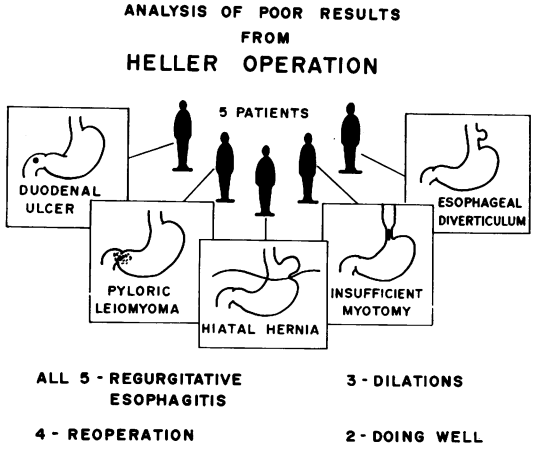

FIG. 4.

Results in these patients having operative procedures other than esophagocardiomyotomy have not been satisfactory; more than a half developed esophagitis. Resection of an esophageal stricture resulting from esophagitis was necessary in three patients, but two died following this procedure.

Results from Esophagocardiomyotomy. Twenty-two patients underwent a modified Heller procedure,[6] and anterior esophagocardiomyotomy. The results of operation are seen in Table 2.

Seventy-seven per cent had good results from operation, while five had poor results. Ellis [3] recently reported 78 per cent good or excellent results from an analysis of 96 patients undergoing esophagocardiomyotomy for achalasia at the Mayo Clinic.

There was no operative mortality. The follow up has been for more than ten years in one-fourth of the patients, and three-fourths of the patients have been followed more than five years.

Those patients who had poor results following a modified Heller operation have been analyzed to ascertain the cause of failure. Three had transabdominal operations and two thoracic. All five developed esophagitis following operation. The reasons for failure are shown in Figure 4. One patient had an associated duodenal ulcer with

TABLE 2. *Results from Esophagocardiomyotomy*

	No. Patients	%	Operative Mortality
Good	18	79	0
Unsatisfactory	5	21	0
Total:	23	100%	0%

achalasia. Following a Heller procedure, his dysphagia recurred within 8 months. Esophagocardiomyotomy was performed again with vagotomy and pyloroplasty, but esophageal stricture developed requiring periodic esophageal dilatations. Another patient had recurrent dysphagia two months after a modified Heller operation and developed an esophageal stricture. Reoperation was performed with resection of the stricture and interposition of a jejunal segment and pyloroplasty. Of interest was an unsuspected leiomyoma in the region of the pylorus. This probably caused gastric outlet obstruction and contributed to the esophagitis following the Heller procedure. Other reasons for failure after a Heller procedure have been hiatal hernia following operation, and failure to carry the myotomy cephalad on the esophagus when operating through the abdomen. One patient had a perforated esophagus at diagnostic esophagoscopy and underwent immediate thoracotomy. An extensive myotomy was done at this time, but the site of esophageal perforation was not found. This patient later developed a diverticulum in the lower one-third of the esophagus. Because of continued dysphagia and esophagitis the diverticulum was excised. She improved somewhat, but still requires an occasional esophageal dilatation.

Four of the five patients with poor results from modified Heller procedures have had reoperations. Two are now doing well. Each had resection of an esophageal stricture with vagotomy and pyloroplasty. Esophageal-gastric continuity was reestablished in one patient by an interposed jejunal segment, and the other patient had an esophagogastrostomy. The other two and the one who has not had a second operation still require periodic esophageal dilatations.

Discussion

The objective of the treatment of achalasia of the esophagus is to alleviate symptoms. The two effective forms of treatment are forceful dilatation and surgical operation. Neither method restores coordinated peristalsis in the esophagus.

Dilatation has been practiced since Thomas Willis[11] described the symptoms of achalasia and dilated his patient in 1674 by means of a whale bone. Browne and McHardy described the pneumatic bag with a mercury bougie in 1939. This has become the dilator generally used in this country and was used in most patients in this series. Results of dilatation have not always been impressive. In this review less than a half of the patients (44%) had good results. The risk of esophageal rupture is real and occurred in 9.4 per cent of 64 patients who underwent dilatation. There was a 3 per cent mortality as a result of perforations. In contrast, there were no deaths in patients undergoing a modified Heller operation.

Many surgical procedures have been used for patients in whom medical therapy or dilatation failed. An excellent description of these operations and an historical review has been written by Steichen, Heller and Ravitch.[9]

Only the modified Heller procedure or anterior myotomy is in general use at this time. Zaaijer[12] in 1923 was the first to utilize an anterior esophagocardiomyotomy. Fifty per cent of his patients who had cardioplasty or side-to-side esophagogastrostomy had poor results because of reflux esophagitis.

Anterior esophagocardiomyotomy has been successful in about 80 per cent of patients. Failures have been due to esophagitis developing after operation. Concomitant pyloroplasty has been advocated to prevent this complication. Two of our poor results might have been avoided by this additional procedure. Hiatal hernia after a Heller procedure has been incriminated by Frobese, Stein and Hawthorne[4] as a reason for postoperative esophagitis. This occurred in one of our patients and empha-

sizes the need to prevent injury to the esophageal hiatus at the time of myotomy and to reapproximate the diaphragmatic crus posterior to the esophagus.

Poor results from the Heller procedure may occur if the myotomy incision is not extended sufficiently upward onto the dilated esophagus. The myotomy needs to extend distally only far enough to expose gastric mucosa. Long distal incisions should be avoided as McVey, Schlegel and Ellis[7] have shown that radical incision on the gastric side does not lower the sphincteric pressure barrier any more than does a short esophagocardiomyotomy and does predispose to reflux esophagitis. There is a tendency to extend the myotomy too far onto the stomach when utilizing the abdominal approach. Unless there is an associated intraabdominal lesion which can be corrected at the same operation, the transthoracic approach is preferred.

Patients in whom results are poor after operation frequently develop esophageal stricture secondary to reflux esophagitis. Neither repeated esophageal dilatations nor repeated esophagocardiomyotomy are effective in these difficult cases because of mucosal scarring. Our best results have been from resection of the strictured terminal esophagus with esophagogastrostomy accompanied by vagotomy and pyloroplasty. An interposition operation may also be effective, but has a higher mortality and morbidity rate and is not necessary in most patients. We have not used the fundic patch esophagocardioplasty recently described by Thal,[10] but believe that this procedure may have merit.

Most patients who had esophagocardiomyotomy were failures after forceful esophageal dilatation. Surgical treatment was seldom primary. Good results from the modified Heller procedure with no mortality have, however, made us believe that the indications for surgical management should be reevaluated. Esophageal perforation from forceful dilation in 9.4 per cent of patients with a 3 per cent mortality and only 44 per cent good results do not compare favorably with results from operation. Patients with pulmonary symptoms from aspiration, associated lesions of the esophagus as hiatal hernia, diverticula, suspected carcinoma and those with gastric hypersecretion and peptic ulcer disease should have primary surgical treatment. Dilatation of a huge, sigmoid-shaped esophagus is dangerous, and operation is preferred. While the decision regarding treatment must be made for each patient individually esophagocardiomyotomy should be considered as a primary treatment.

Summary

The time-honored management of achalasia of the esophagus has been forceful dilatation. Surgical procedures are usually reserved for patients failing to respond to dilatation. A review of results of dilatation in our institution shows that only 44 per cent of patients had good results. Esophageal perforation during dilatation occurred in 9.4 per cent with a 3 per cent mortality. On the other hand, surgical management by esophagocardiomyotomy (modified Heller procedure) had good results in almost 80 per cent of patients with no operative mortality.

Patients who had unsatisfactory results after esophagocardiomyotomy have been analyzed to ascertain the reasons for failure. Technical errors, development of postoperative hiatal hernia, and partial gastric outlet obstruction leading to reflux esophagitis were contributing factors. Treatment of these failures has been difficult. Resection of esophageal strictures with esophagogastrostomy, vagotomy and pyloroplasty may be necessary.

Esophagocardiomyotomy is effective and should have wider application as initial treatment for selected patients with achalasia.

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Discussion

Dr. Osler A. Abbott (Atlanta): Dr. Noer, Dr. Yeager, ladies and gentlemen. I had the privilege of reading Dr. Sawyers' and Dr. Foster's manuscript and I certainly agree that patients with achalasia of the esophagus must be significantly individualized in regard to treatment.

It is our basic premise that significant symptoms in conjunction with objective evidence of a serious degree of obstruction on x-ray and classical abnormality on esophageal motility studies, when seen in the youngster of 12 to 18 years, should not be subjected to repetitive dilatation. Such individuals should be treated initially by permanent surgical correction.

In a similar manner, patients with massive esophageal dilatation and redundant sigmoid curve deformity in the lower portion of the esophagus are high-risk patients for dilatation. We would prefer, in these cases, to mobilize the esophagus, bring the redundant portion down under the diaphragm, excise some of the excess length and perform a subdiaphragmatic esophagogastrostomy with pyloroplasty.

Certainly Ellis's contributions in regard to the value of esophageal motility studies as an indication as to the optimal height of myotomy have been well substantiated in our experience.

I would make a strong plea that dilatation should be performed by people who do esophageal surgery. In 1946 we were fortunate to obtain control of this aspect of management of esophageal obstruction in our institution. Thus we believe we have eliminated potential competition of therapeutic methods. Furthermore, those who employ dilatation can recognize any complication somewhat earlier and are in a position to institute corrective measures with minimal delay. The complications of medical instrumentation and delayed recognition of perforation are only too well known.

I would again like to compliment Dr. Sawyers on his contribution and reemphasize his concept that individualization is fundamental for proper management of achalasia.

Dr. John L. Sawyers (Closing): I certainly want to thank Dr. Abbott for his remarks. We only wish that we could gain control of dilatation of the esophagus from our gastroenterologists. However, we feel that the good results from the Heller procedure in most of these patients will probably lead us to use primary surgical therapy in a majority of the patients, even if we did have control of esophageal dilation. Thank you.