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Papers presented

Cause and treatment of epiphrenic diverticula

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Abstract

Background: Epiphrenic diverticula of the esophagus are often associated with a concomitant esophageal motor disorder, which is thought to be the cause of the diverticulum and some of the patient's symptoms. At one time diverticula were best removed via a left thoracotomy, but now the operation can be performed laparoscopically in most cases. We hypothesized that: (1) a motor disorder is the underlying cause of the diverticulum; and (2) optimal treatment consists of laparoscopic resection of the diverticulum, a Heller myotomy, and Dor fundoplication.

Methods: We performed a retrospective review of a prospectively collected database from a university hospital tertiary care center. Between June 1994 and December 2002, we evaluated 21 patients with epiphrenic diverticula. An associated motility disorder of the esophagus was found in 81% of patients (achalasia, 9%; diffuse esophageal spasm, 24%; nonspecific esophageal motility disorder, 24%; nutcracker esophagus, 24%). Seven (33%) of these patients, all with esophageal dysmotility, were referred for treatment. The laparoscopic operation entailed resection of the diverticulum (using an endoscopic stapler), a Heller myotomy, and a Dor fundoplication.

Results: All operations were completed laparoscopically. The postoperative course of 6 patients was uneventful and they left the hospital after 72 ± 21 hours. In 1 patient an acute paraesophageal hernia developed, which was repaired on the second postoperative day. Late follow-up (median 57 months) showed that all 7 patients were asymptomatic.

Conclusions: These data support the conclusions that: (1) a primary esophageal motility disorder is the underlying cause of most epiphrenic diverticula; and (2) laparoscopic treatment is successful and should be the method of choice. The diverticular neck can be exposed satisfactorily from the abdomen; a stapler inserted from this angle is better orientated to transect the neck than one inserted through a thoracoscopic approach. Furthermore, the myotomy and fundoplication are much more easily performed from the abdomen than from alternative approaches.

Keywords: Esophageal manometry; Primary esophageal motility disorders; Achalasia; Diffuse esophageal spasm; Nutcracker esophagus; Epiphrenic diverticulum; Laparoscopic Heller myotomy

Epiphrenic diverticula of the esophagus are often associated with a concomitant esophageal motor disorder, which is thought to be the cause of the diverticulum and at least some of the patient's symptoms [1–4]. In the past, epiphrenic diverticula were usually excised via a left thoracotomy [2–7], but the operation can now be performed laparoscopically [8–11].

We performed this study to determine: (1) if a motor disorder is often associated to a epiphrenic diverticulum; and (2) if laparoscopic resection of the diverticulum and a Heller myotomy and Dor fundoplication are effective.

Patients and Methods

Between June 1, 1994 and December 23, 2002, we evaluated 21 patients with epiphrenic diverticula. There were 15 men and 6 women, with a mean age of 64 years (range 31 to 86 years).

Symptoms

Symptoms were graded using a 5-point scale, ranging from 0 (no symptoms) to 4 (disabling symptoms). Swallowing status was graded as follows: excellent (no dysphagia), good (occasional dysphagia), fair (frequent dysphagia requiring dietary adjustments), and poor (severe dysphagia preventing the ingestion of solid food).

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Radiology

A barium esophagram was performed in all patients. The following were recorded: location of the diverticulum, maximal diameter of the pouch, and diameter of the diverticular neck. In addition, the appearance of the gastroesophageal junction (normal vs. narrowing) and the presence of tertiary contractions were documented.

Endoscopy

The endoscopist recorded findings of esophagitis or those suggestive of a motility disorder, such as distal esophageal narrowing (peptic and neoplastic strictures were excluded), esophageal body dilatation, or the presence of retained food. No attempt was made to enter the diverticulum once the neck was located in the distal esophagus.

Esophageal manometry

The patients were studied after an overnight fast as previously described [12]. Medications that might interfere with esophageal motor function were discontinued at least 48 hours before the study. The manometry catheter was positioned under fluoroscopic guidance in 16 patients (76%) and under endoscopy in 5 patients (24%). The disorders were diagnosed as achalasia, diffuse esophageal spasm, nutcracker esophagus, or nonspecific esophageal motility disorder based on the characteristic manometric findings [13].

Ambulatory pH monitoring

The test was performed as previously described [12]. Acid-suppressing medications were discontinued 3 days (H_2-blocking agents) to 14 days (proton pump inhibitors) before the study. During the study the patients consumed an unrestricted diet and took no medications that could interfere with the results.

Surgical treatment

Choice of treatment was based on the preference of the referring physician and the patient's, and the patient's eligibility for treatment at the University of California San Francisco. Some patients, in fact, belonged to a health maintenance organization and were referred to our Swallowing Center for evaluation only but not for treatment. Therefore, choice of therapy was independent from us and we were unable to obtain detailed follow-up in these patients. We advised surgery for every patient and the patients who were operated on in our center were similar in terms of age, duration of symptoms, type of motility disorder, and diverticulum to the patients who were treated elsewhere. Seven (33%) of the 21 patients underwent laparoscopic resection of the diverticulum, Heller myotomy, and Dor fundoplication. We were unable to obtain follow-up information on the patients who were treated elsewhere.

The position of the patient on the table and the number and position of the 5 trocars is similar to that of a laparoscopic fundoplication or Heller myotomy [14]. The steps are as follows: (1) dissect in the posterior mediastinum. The dissection is more difficult than for other laparoscopic procedures at the hiatus, for the diverticular pouch must be isolated from the surrounding structures, the neck of the diverticulum cleared, and the edges of the esophageal musculature through which the diverticulum emerges identified. (2) Transect the diverticular neck. A stapler with 2.5-mm staples (vascular cartridge) is used. The instrument is placed parallel to the axis of the esophagus. (3) Approximate the esophageal muscle layers over the stump of the diverticular neck using 2-0 silk interrupted sutures. (4) Perform a Heller myotomy and Dor fundoplication. The myotomy is performed on the side opposite the diverticulum. It should extend from the body of the esophagus to 1.5 to 2 cm onto the gastric wall. (5) Close the esophageal hiatus using interrupted 2-0 silk sutures [14].

Follow-up

All patients were seen in follow-up 2 and 8 weeks postoperatively. Subsequently they were seen again in the office or were interviewed by telephone at 4- to 6-month intervals.

Statistical analysis

The sign test was used for statistical evaluation of nonparametric data (symptom score). Differences were considered significant at $P < .05$.

Results

Symptoms

Seventeen patients (81%) complained of dysphagia, 17 patients (81%) of regurgitation, 13 patients (62%) of chest pain, and 12 (57%) of heartburn. In 10 patients (48%) the history was typical for intermittent episodes of aspiration, mostly during the night. The median duration of symptoms was 60 months.

Barium swallow

The barium study showed that the diverticulum was located on the right side of the esophagus in 16 patients (76%). The average size of the pouch was 7 cm. Findings suggestive of a primary esophageal motility disorder (distal esophageal narrowing, corkscrew esophagus) were present in 9 patients (43%) (Fig. 1). A hiatal hernia was present in 6 patients (29%). A Zenker's diverticulum was identified in 1 patient.