

Laparoscopic Esophageal Mucosal Resection for High-Grade Dysplasia

The videos associated with this chapter are listed in the Video Contents and can be found on the accompanying DVDs and on Expertconsult.com.

Barrett esophagus is defined as the metaplastic replacement of the normal squamous epithelium of the distal esophagus by columnar epithelium. Three histopathologic subtypes of metaplastic columnar epithelium have been described: two gastric phenotypes and one intestinal type. Because the intestinal type has the greatest risk for malignant transformation, the 2008 guidelines of the American College of Gastroenterology specify that the term *Barrett esophagus* should be restricted to columnar epithelium containing intestinal metaplasia. Estimates of the frequency of Barrett esophagus in the general population have ranged from 0.9% to 4.5%. Gastroesophageal reflux disease is the only known risk factor associated with the development of Barrett esophagus. A recent review of 15 epidemiologic studies in patients with gastroesophageal reflux disease (defined by at least weekly heartburn or acid regurgitation) identified a Barrett esophagus prevalence of 10% to 20% in the West and about 5% in Asia. Barrett esophagus with high-grade dysplasia is considered a premalignant condition. In patients with known Barrett esophagus, the annual risk for developing adenocarcinoma ranges from 0.2% to 2.0%.

The current gold standard for the treatment of Barrett esophagus with high-grade dysplasia is esophagectomy because of the perceived prevalence of invasive carcinoma in such specimens after esophagectomy. Recently, however, a meta-analysis of esophagectomy for high-grade dysplasia revealed invasive adenocarcinoma in only 12.7% of specimens. These data, along with inability or unwillingness to undergo esophagectomy, have further encouraged some patients to pursue more conservative treatment options for high-grade dysplasia. Other treatment options include endoscopic thermal therapy, photodynamic therapy, radiofrequency ablation, and laser ablation. Endoscopic mucosal resection has also been described as successful in treating high-grade dysplasia. One of the drawbacks of endoscopic mucosal resection for high-grade dysplasia or early esophageal cancer in Barrett esophagus has been the high rate of recurrent or metachronous lesions during follow-up in recent series (11% to 30%). Another drawback of endoscopic mucosal resection is that Barrett esophagus affecting segments longer than 2 cm is difficult to treat with endoscopic mucosal resection because piecemeal resection is often necessary. This usually requires a higher level of endoscopic expertise, multiple sessions, and an increased risk for complications. Additionally, it is difficult to be conclusive about the completeness of the resection at the lateral margins. This chapter presents a surgical alternative to esophagectomy and endoscopic management for

high-grade dysplasia of the distal esophagus. The senior author (CTF) and colleagues previously published the success of laparoscopic transgastric esophageal mucosal resection; this chapter and the recording on the accompanying DVD (as well as on Expert Consult) are a follow-up to those published reports.

OPERATIVE INDICATIONS

Barrett esophagus with high-grade dysplasia on endoscopic biopsy is an indication for esophageal mucosal resection. A segment of Barrett esophagus longer than 5 cm may require a combined endoscopic and laparoscopic approach.

PREOPERATIVE EVALUATION

The objectives of the preoperative evaluation include (1) confirming the diagnosis of Barrett esophagus with high-grade dysplasia, (2) evaluating for hiatal hernia, (3) evaluating for neoplasm or dysmotility, and (4) determining the patient's suitability for the operation.

A chest radiograph may demonstrate a hiatal hernia and provide information about its size and contents. Concomitant lung disease can be identified as well.

An upper gastrointestinal contrast study will provide information on the anatomy of the esophagus and stomach, which is especially helpful when there is an associated hiatal hernia. In addition, an upper gastrointestinal study can provide direct evidence of the extent of gastroesophageal reflux disease. In the hands of an experienced radiologist, the study can also provide information on the patient's esophageal motility.

An esophagogastroduodenoscopy (EGD) permits direct evaluation of the esophagogastric mucosa. Biopsies of the mucosa can confirm the presence of Barrett esophagus with high-grade dysplasia as well as the presence or absence of cancer. The EGD can also verify the presence of a hiatal hernia.

If the patient has a large hiatal hernia, then a computed tomography scan of the chest is helpful in delineating the anatomy and contents of the hernia sac, including the presence of organs other than the stomach.

POSITIONING AND PLACEMENT OF TROCARS

The patient is placed in a modified French lithotomy position with 30-degree reverse Trendelenburg (see Fig. 5-1 in Chapter