Transthoracic Gastroplasty (Collis) and Nissen Fundoplication

**INDICATIONS**

- Short esophagus due to reflux esophagitis
- Recurrent gastroesophageal reflux with stricture after an antireflux procedure
- Previous subtotal gastrectomy generally contraindicates a Collis-Nissen procedure

**PREOPERATIVE PREPARATION**

- Dilate the esophageal stricture up to 40F. It can generally be done with Maloney dilators.
- Insert a nasogastric tube down to the stricture.
- Assessment for colon interposition is prudent in difficult cases (see Chapter 14). Bowel preparation allows colon to be used as a conduit if needed.
- When esophagoscopy reveals severe acute ulcerative esophagitis with inflammation and bleeding, a 2- to 3-week period of preoperative intensive medical treatment with cimetidine, omeprazole, or both reduces inflammation and lessens the risk of intraoperative perforation of the esophagus.

**PITFALLS AND DANGER POINTS**

- Esophageal perforation
- Hemorrhage resulting from traumatizing or avulsing the accessory left hepatic artery, inferior phrenic artery, ascending branch of the left gastric artery, short gastric vessel, or inferior pulmonary vein
- Laceration of spleen
- Inadvertent vagotomy
- Inadequate suturing, permitting the fundoplication to slip postoperatively

**OPERATIVE STRATEGY**

**Performing an Adequate Gastroplasty**

The object of performing a gastroplasty is to lengthen a shortened esophagus for an extent sufficient to prevent tension from being exerted on the antireflux operation and hernia repair. This newly constructed esophagus (“neoesophagus”) consists of a tube made from the lesser curvature of the stomach. A 56F Maloney dilator is passed into the stomach, and the tube is constructed by applying an 80 mm linear cutting stapler precisely at the esophagogastric junction parallel to and snugly alongside the Maloney dilator. When the stapler is fired, the esophageal tube is lengthened by as much as 7 cm. If the stapler has been placed snugly against the esophagogastric junction, there are no irregularities or outpouchings at this point.

**Mobilizing the Esophagus and Stomach**

Not only is it important to mobilize the distal esophagus completely, at least as far up as the inferior pulmonary vein, but the proximal stomach must be entirely free of attachments, just as when a Nissen fundoplication is being performed through an abdominal approach. This operation can be accomplished without tension only with full mobilization. It requires dividing the phrenoesophageal and gastrophrenic ligaments, freeing the hiatus throughout its complete circumference from any attachments to the stomach or lower esophagus, and dividing an accessory left hepatic artery, which courses from the left gastric artery across the proximal gastrohepatic ligament to help supply the left lobe of the liver. After mobilization has been accomplished, the remaining maneuvers in the Collis-Nissen operation are not difficult.

If the esophagus is inadvertently perforated during the dissection, exercise careful judgment when deciding whether it is safe to suture the esophageal laceration or a resection and colon or jejunum interposition is necessary. If it is elected to suture the laceration, try to cover the suture line with a flap of parietal pleura (see Figs. 23-1 to 23-3).

**Avoiding Hemorrhage**

Avoiding unnecessary bleeding during any operation requires a careful dissection and a knowledge of...
vascular anatomy. This is especially important when mobilizing the stomach through a thoracic approach because losing control of the accessory left hepatic, short gastric, or inferior phrenic artery causes the proximal bleeding arterial stump to retract deep into the abdomen. Controlling these retracted vessels is difficult and may require laparotomy or at least a peripheral incision in the diaphragm. Preventing this complication is not difficult if the dissection is orderly and the surgeon is aware of the anatomic location of these vessels. Similarly, careful dissection and avoidance of traction along the greater curvature of the stomach helps prevent damaging the spleen.

Avoiding Esophageal Perforation

When the distal esophagus is baked into a fibrotic mediastinum, sharp scalpel dissection is safer than blunt dissection if injury to the esophagus and the vagus nerves is to be avoided. Sometimes the fibrosis terminates 8–9 cm above the diaphragm. If so, the esophagus and the vagus nerves can easily be encircled at this point, which provides a plane for subsequent dissection of the distal esophagus.

OPERATIVE TECHNIQUE

Incision

With the patient under one-lung anesthesia in the lateral position, left side up, make a skin incision in the sixth intercostal space from the costal margin to the tip of the scapula (Fig. 18–1). Then identify the latissimus dorsi muscle and insert the index finger underneath it. Transect this muscle with electrocautery; then divide the underlying anterior serratus muscle in similar fashion (Fig. 18–2). In both cases it is preferable to divide these muscles somewhat caudal to the skin incision, as it helps preserve muscle function. Then use electrocautery to divide the intercostal muscles along the upper border of the seventh rib (Fig. 18–3) and open the pleura. Complete this opening from the costal margin to the region of the lateral spinal muscles. Separate the periosteum and surrounding tissues from a 1 cm segment of the posterior portion of the seventh rib lateral to the spinal muscles. Excise a 1 cm segment of this rib (Fig. 18–4). Then divide the intercostal neurovascular bundle that runs along the inferior border of this rib (Fig. 18–5).