Laparoscopic Nissen Fundoplication

INDICATIONS
Symptomatic reflux esophagitis refractory to medical therapy
Barrett’s esophagus (consider mucosal ablation)

PREOPERATIVE PREPARATION
Pass a nasogastric tube to decompress the stomach.
See Chapter 15.

PITFALLS AND DANGER POINTS
Injury to the esophagus.
Tension pneumothorax due to unrecognized entry into the mediastinal pleura. Even a relatively small tear can allow CO\textsubscript{2} to enter the pleural space and compromise ventilation.
Injury to spleen or stomach.
Failure to create a sufficiently floppy wrap.

OPERATIVE STRATEGY
Several laparoscopic fundoplications have been devised. We prefer the laparoscopic Nissen fundoplication because it is intended to be virtually identical to a well established open procedure when completed. The steps in the dissection are necessarily a bit different from those for the open procedure, and several additional features should be noted.
First, the hiatus is accessed by elevating the left lobe of the liver without dividing its attachments. Second, the esophagus is exposed and mobilized by dissecting the crura with minimal manipulation of the esophagus. The resulting extensive mediastinal dissection that accompanies esophageal mobilization makes approximation of the crura mandatory. Postoperative herniation of the stomach or small intestine may complicate the laparoscopic procedure when this step is omitted. Finally, several short gastric vessels must be divided to ensure creating a floppy wrap.

OPERATIVE TECHNIQUE
Room Setup and Trocar Placement
Position the patient with the legs slightly spread and supported on padded stirrups (Fig. 16–1). Position the monitors at the head of the table. We place the primary monitor at the patient’s left shoulder, with a secondary monitor at the patient’s right, as shown. Some surgeons use a single monitor placed over the head of the operating table. We prefer to stand in
the usual position, at the patient's side, for the initial puncture and entry into the abdomen. During dissection and suturing, the surgeon should stand between the patient's legs, directly facing the hiatus (Fig. 16–2). When choosing an initial puncture site (to be used for the laparoscope) recall that the hiatus is quite high and deep. The normal umbilical port site may therefore be too low. A trocar pattern must be individualized according to the patient's body habitus. A 30° angled laparoscope is mandatory for easy visualization.

Exposure of the Hiatus

Pass a liver retractor through the right lateral port site. A variety of liver retractors are available, and which one is chosen is largely a matter of the surgeon's preference. We prefer a flexible retractor that becomes rigid and assumes the shape shown in Figure 16–3 when a screw is turned. The particular retractor shown is composed of many short segments with an internal cable. When the tension on the cable is released, the retractor becomes limp and may be straightened out to pass it through a trocar. Once the retractor is inside the abdomen, the cable is tightened by twisting a knob on the handle. Increasing tension on the internal cable forces the articulations to bend into the shape shown. The retractor is bent into shape by tightening the cable in the commodious right subphrenic space and is then passed underneath the liver.

The liver retractor is properly placed when stable exposure is obtained and the diaphragmatic surface is seen behind the left lobe of the liver. It may not be possible to distinguish the actual hiatus at this point. This exposure generally requires that the retractor be “toed in” so the part of the retractor closest to the hiatus has maximal lift applied. The laparoscope and instruments are then insinuated underneath the left lobe of the liver in the working space thus created.

Generally, the stomach and some omentum partially or completely obscure the hiatus even with the liver retracted. Therefore the second part of obtaining exposure entails placing an endoscopic Babcock clamp on the stomach and pulling toward the left lower quadrant (Fig. 16–4).

Dissecting the Hiatus

The esophagus is dissected by clearing the peritoneum off the hiatus and carefully exposing the