

Laparoscopic Management of Failed Antireflux Surgery

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Summary: Whether performed open or laparoscopically, antireflux procedures for gastroesophageal reflux disease sometimes fail and may require reoperation for optimal results. Between June 1992 and May 1995, eight patients presented with a failed antireflux procedure. Four patients had previously had a Belsey operation performed through the chest, two had had open Nissen funduplications, and two had Nissen funduplications performed via laparoscopy. Preoperative workup included cardiac, hematologic, and pulmonary evaluation as well as Esophagogastroduodenoscopy (EGD), esophageal manometry, and 24-h pH studies to document reflux as a cause of recurrent symptoms. Two patients had aspiration symptoms even on medication. All patients had severe esophagitis on biopsy. Six reoperations (75%) were completed laparoscopically. In two patients we converted to open procedures due to an inability to expose the esophageal hiatus secondary to adhesions between the left lobe of the liver and the stomach. Of the six patients completed laparoscopically, one had a Nissen fundoplication and the others had a 200° partial wrap. Two patients developed left pneumothorax, one patient required a single postoperative dilation, and one patient treated with open surgery developed pneumonia. The average hospitalization for laparoscopy was 2.2 days (range, 1-4 days), while those two who underwent open surgery stayed in the hospital 5 and 6 days. All patients were followed from 12 to 42 months and all are currently off medication and free of symptoms. Laparoscopic re-exploration for esophageal reflux disease can be safely performed with excellent results. **Key Words:** Laparoscopy—Gastroesophageal reflux—Nissen operation—Reoperation.

Surgical management of reflux esophagitis has followed the path of cholecystectomy, becoming minimally invasive over the past 5 years (1). Although not as widespread as laparoscopic cholecystectomy, series of laparoscopic antireflux procedures are being reported at an increasing rate (2-6).

Since no tissue is removed and the area of surgery is generally without acute inflammation, antireflux surgery lends itself to a minimally invasive approach. Laparoscopic treatment of gastroesophageal reflux disease has yielded excellent results and is enjoying an increasing popularity. Unfortunately, this operation sometimes fails, whether performed open or laparoscopically, and may

require reoperation for optimal results. Reoperations are more difficult due to obscuration of anatomic planes and adhesions from the previous surgery. The chances of organ injury, pneumothorax, diaphragm injury, vagal nerve injury, splenic trauma, and bleeding are all increased when a reoperation is undertaken (7,8).

This paper reports our experience with the laparoscopic management of failed antireflux surgery.

MATERIALS AND METHODS

Between June 1992 and May 1995, 188 patients who presented to our offices underwent laparoscopic treatment of gastroesophageal reflux disease. Eight patients had previously undergone an antireflux procedure. These eight cases are reviewed in this report.

Sex distribution was evenly divided. The average age was 47 years (range, 38-62) and average weight was 174 lb (range 118-215 lb).

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Four patients had previously had a Belsey operation performed through the chest, two had open Nissen funduplications, and two had Nissen funduplications previously performed via laparoscopy. Seven patients had been initially operated on at other institutions. One patient had undergone laparoscopic Nissen funduplications by the authors.

Preoperative workup included cardiac, hematologic, and pulmonary evaluation as well as EGD, esophageal manometry, and 24-h pH studies to document reflux as a cause of recurrent symptoms. Two patients also had gastric emptying studies. Two patients presented with preoperative dysphagia and were dilated to 50 F prior to surgery. Two patients had aspiration symptoms even on medication. All patients had severe esophagitis on biopsy.

RESULTS

Laparoscopic access was attempted on all patients. All Belsey repairs had come apart. Sutures could be seen, but they had obviously pulled through, allowing the repair to fail. Sutures had pulled through in two patients who had undergone Nissen repair. In the other two Nissen recipients, sutures were intact, but the repair was determined to be too tight by documenting on fluoroscopy that barium tablets would not pass through the repaired area and by the inability to pass a gastroscope through the repair.

Six reoperations (75%) were completed laparoscopically. In two patients, operations were converted to open procedures due to the inability to expose the esophageal hiatus secondary to adhesions between the left lobe of the liver and the stomach. One of these patients had previously had a combined laparoscopic Nissen operation and laparoscopic highly selective vagotomy. The other had had an open Nissen operation. Both of these patients underwent an open partial fundoplication. All patients were followed from 12 months to 42 months, and all are now off medication and free of symptoms. Postoperative pH monitoring was done to document absence of reflux.

Of the six patients in whom surgery was completed laparoscopically, one had a Nissen fundoplication and the others had a 200° partial wrap. There were no esophageal, splenic, or gastric injuries. There were no deaths in either group. Those who underwent laparoscopy were hospitalized an average of 2.2 days (range, 1–4 days) while those two who were treated with open surgery stayed in the hospital 5 and 6 days. All patients were eating a regular diet at discharge.

Two laparoscopically treated patients developed left pneumothorax which resolved over 24 h with observa-

tion. Both had previously undergone Nissen fundoplication and required a high esophageal dissection to identify proper anatomical planes. One patient undergoing laparoscopic treatment required a single postoperative dilation for treatment of persistent dysphagia. One open surgery patient developed right lower lobe pneumonia, which resolved with treatment.

DISCUSSION

Gastroesophageal reflux disease can be treated successfully and safely with laparoscopic surgery. The benefits of the laparoscopic approach are the same as those of cholecystectomy, namely, less postoperative pain and therefore a quicker recovery. We have demonstrated in this small series that repeat surgeries in the area of the gastroesophageal junction can also be performed safely by surgeons with excellent laparoscopic skills and good surgical judgment. Our results compare favorably with those of Hill et al. (8) who reported good to excellent results in 22 of 24 patients who had failed Nissen operation and were subsequently reconstructed with an open operation. All repairs in that study were made with a posterior gastropexy and guided by intraoperative manometry.

As with laparoscopic cholecystectomy, conversion to an open procedure is always a prudent option when visualization is hindered by bleeding, distorted anatomy, or adhesion formation. We converted a laparoscopic procedure to an open one in 25% of our patients. This was considerably higher than the 4.2% conversion rate seen in primary laparoscopic operations for reflux disease (9). Theoretically, a surgeon with more familiarity with the area gained during routine cases should have a lower conversion percentage than the less experienced surgeon; however, each case poses its own difficulties, and the choice to open should not be based on, or judged by, percentages.

Since previous surgery is likely to cause intra-abdominal adhesions, blind puncture for insufflation and initial trocar insertion is discouraged. We routinely use an open technique adapted from Hasson (10) for our initial trocar insertion. We have not had an intestinal injury with this technique. All secondary trocars are inserted under laparoscopic guidance. Adhesions are taken down sharply with scissors or with the ultrasonic scalpel. Monopolar energy is never used to lyse adhesions due to its uncontrollability and increased chance of intestinal injury. Care should be taken to apply traction and countertraction to properly identify tissue planes between the intestine and other structures.

Liver adhesions to the diaphragm and stomach have caused the most difficult problems, accounting for both conversions to open surgery in this series. All adhesions to the liver capsule should be taken down sharply or with the harmonic scalpel because blunt dissection may cause a tear of the capsule and subsequent bleeding.

A very helpful maneuver when adhesions are encountered between the stomach and liver is to transect the triangular ligament between the left lobe of the liver and the diaphragm, leaving the liver attached to the stomach by adhesions. In most techniques of laparoscopic fundoplication, the triangular ligament is not transected; therefore, this is a virgin anatomic plane for dissection during the reoperation. Leaving the liver attached to the stomach decreases the chance of injury to either organ and decreases the blood loss and time of dissection. The left lobe of the liver can be retracted medially with a fan retractor or with a grasper placed on the triangular ligament.

Each crus should be identified where it joins anteriorly, and blunt dissection should be utilized to free crura from the esophagus and connective tissue. This will cause the least amount of bleeding. Blunt dissection should be carried out with two instruments juxtaposed to each other or with a laparoscopic Kittner. To limit the chance of injury to the esophagus, electrical cautery should not be used for dissection. Both vagal branches should be identified to decrease the chance of injury with subsequent decrease in gastric motility.

A dilator, lighted bougie, or endoscope may be used to aid in the identification of the esophagus. With greater experience, we have found this unnecessary most of the time, but it can be invaluable for a surgeon less experienced with this technique. The anesthesiologist should watch the video screen while passing a dilator through the esophagus to assure excessive force is not placed on the tube, causing perforation. The combination of a friable esophagus and an acute angle caused by traction can enhance the chance of perforation. Once the esophagus is identified, the dilator is removed. We feel that perforation is more likely with a thinned, distended esophagus than a less tense one.

The esophagus should never be grasped. Every grasping instrument we have used is traumatic enough to injure the esophagus, and due to the tube's friability and lack of a serosal layer, there is a small margin of safety for esophageal handling. It should be pushed gently from side to side until the lateral and medial planes are dissected. An O'Reilly retractor (Access Surgical, Plymouth, MA, U.S.A.) or other right-angle blunt retractor should be placed around the esophagus to free up the posterior aspect. Use of a sharp instrument in this phase

makes posterior esophageal wall injury a greater possibility.

Most of the time, the anatomy near the gastroesophageal junction is encased in scar tissue. It is safer to expose the hiatus and perform the initial dissection around the esophagus 5–10 cm cephalad in the posterior mediastinum. This can be facilitated somewhat by caudad traction on the stomach with a Babcock clamp. High dissection makes pneumothorax more likely, and a high index of suspicion should be maintained and signs of respiratory distress immediately evaluated and treated. In our experience, these pneumothoraces are small, cause minimal symptoms, and do not usually require a chest tube for resolution.

The choice of repair will vary with personal preference and anatomical and laboratory findings. Patients with poor motility studies (amplitudes less than 35 mm on manometry) may fare better with a partial wrap. A partial wrap also requires less dissection around the short gastric vessels and the spleen, making it somewhat easier in cases of severe adhesions to the splenic area. The partial wrap requires more posterior dissection, however, and may be less desirable in some cases. We have had excellent results with the partial wrap in primary cases and have chosen to use it as our primary repair in reoperations.

Using careful surgical technique, we have been able to laparoscopically reoperate and repair 75% of all failed antireflux procedures referred to us. Prior to attempting reoperations, surgeons should gain expertise and knowledge of the operative area by performing a large number of primary antireflux procedures through a laparoscopic approach. Very little time is lost by attempting a reoperation through a laparoscopic approach, and the experience a surgeon gains prior to converting a case is invaluable in future operations.

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