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This chapter describes the preoperative work-up, operative planning, and the laparoscopic enucleation of esophageal leiomyoma.

13.1 Clinical History

The patient is a 38-year-old woman who started experiencing progressive dysphagia 6 months prior to her presentation. An endoscopy showed a submucosal mass in the distal

esophagus. The mucosa overlying the mass was normal. An endoscopic ultrasound confirmed the presence of the mass in the distal esophagus and showed a similar mass in the proximal stomach along the lesser curvature. A CT scan confirmed the finding.

It was decided to attempt a laparoscopic excision of both the gastric and the esophageal masses. The preoperative tests were not able to determine whether there were two separate tumors or only one tumor.

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13.2 Operation

13.2.1 Patient Positioning

The patient lies supine on the table over a bean bag (inflated to prevent sliding in reverse Trendelenburg position). The legs are extended on stirrups, and the knees are flexed at an angle of 20–30°.

The surgeon performs the procedure standing between patient's legs, with two assistants on the right and left sides of the operating table (Fig. 13.1).

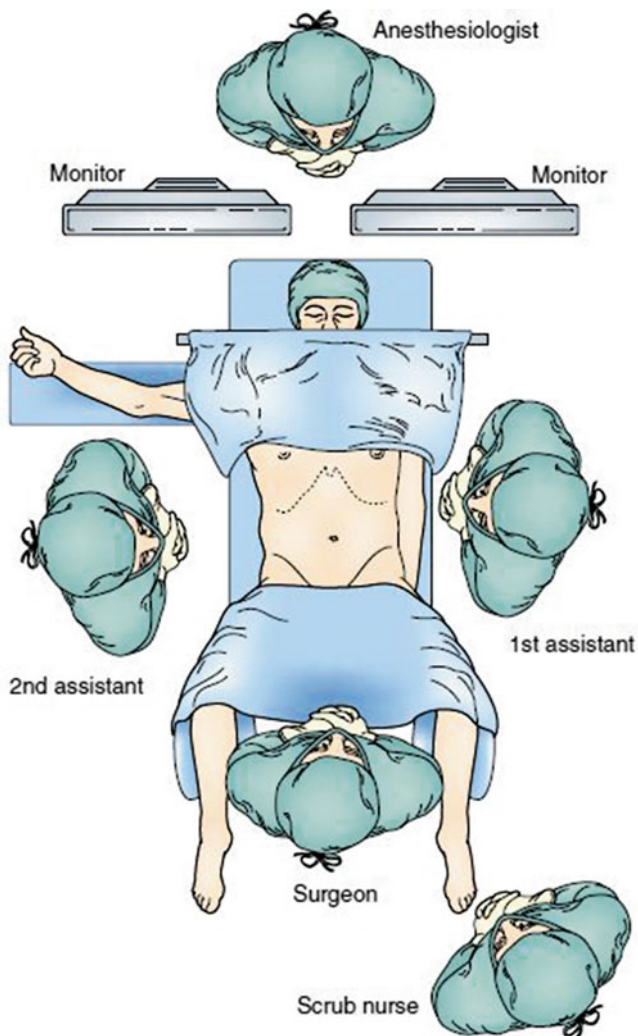


Fig. 13.1 Setup of the operating room

13.2.2 Ports and Instruments

Five trocars (Fig. 13.2) are used for the procedure:

- *Trocar 1*: Placed 14 cm inferior to the xiphoid process in the midline (or 1–2 cm to the left of the midline to be in line with the hiatus). It is used for a 30° camera.
- *Trocar 2*: Placed in the left mid clavicular line (at the same level as trocar 1). It is used for a Babcock clamp, a grasper to hold the Penrose drain, or an instrument used to divide the short gastric vessels.
- *Trocar 3*: Placed in the right mid-clavicular line (at the same level as the first two trocars). It is used for the insertion of a liver retractor.
- *Trocars 4 and 5*: Placed under the right and left costal margins. They are used for the suturing and dissecting instruments.

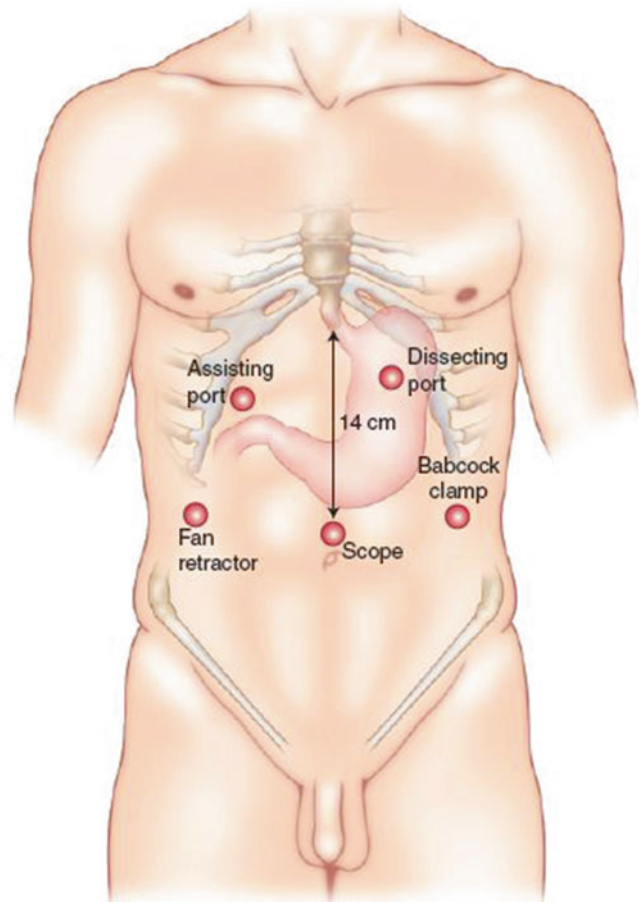


Fig. 13.2 The positions and functions of the five trocars

13.2.3 Operative Procedure

Step 1 Division of the gastrohepatic ligament, peritoneum, and phrenoesophageal membrane

The gastrohepatic ligament is divided, beginning above the caudate lobe of the liver (Figs. 13.3 and 13.4). The peritoneum and the phrenoesophageal membrane above the esophagus are transected with electrocautery, and the anterior vagus nerve is identified (Fig. 13.5). The left crus of the diaphragm is dissected downward toward the junction with the right crus (Fig. 13.6).

Step 2 Dissection of the gastric component

The gastric component of the tumor is identified (Figs. 13.7 and 13.8), and the short gastric vessels are divided with a bipolar instrument (Figs. 13.9 and 13.10).

The tumor is dissected using a combination of the electrocautery and the bipolar instrument (Figs. 13.11, 13.12, 13.13, 13.14, 13.15, 13.16, 13.17, 13.18, 13.19, and 13.20). It is possible to identify the characteristic “mother of pearl” appearance of the tumor capsule. Particular attention is given to avoiding a thermal or traction injury to the mucosa.

Step 3 Dissection of the esophageal component

The esophageal component of the tumor is carefully separated from the esophageal mucosa using a combination of blunt dissection, hook cautery, and a bipolar instrument

(Figs. 13.21, 13.22, 13.23, 13.24, 13.25, 13.26, 13.27, 13.28, 13.29, and 13.30).

The esophageal mucosa is carefully inspected (Figs. 13.31 and 13.32). An orogastric tube is then placed just proximal to the diaphragm, and methylene blue is injected to rule out a hole in the mucosa.

Step 4 Construct dor fundoplication

After the excision of the tumor, the edges of the muscle layers in this patient were far apart, so we did not try to approximate them over the mucosa for fear of significantly narrowing the esophageal lumen. We decided to cover the exposed mucosa with a Dor fundoplication, similar to what we do after a Heller myotomy for achalasia.

An anterior partial fundoplication (Dor fundoplication) is constructed using two rows of sutures. The first row of sutures is on the left and has three stitches. The first stitch (superior) is triangular, and incorporates the gastric fundus, the left side of the esophageal wall, and the left pillar of the crus (Fig. 13.33). The second stitch and the third stitches incorporate the esophageal and the gastric wall (Fig. 13.34). The second row of sutures is on the right side. Usually three stitches are used, which incorporate the right pillar of the crus and the gastric fundus (Fig. 13.35). Finally, two or three stitches are placed in the apical portion between the gastric fundus and the rim of the esophageal hiatus (Fig. 13.36). The Dor fundoplication then completely covers the exposed mucosa (Fig. 13.37).

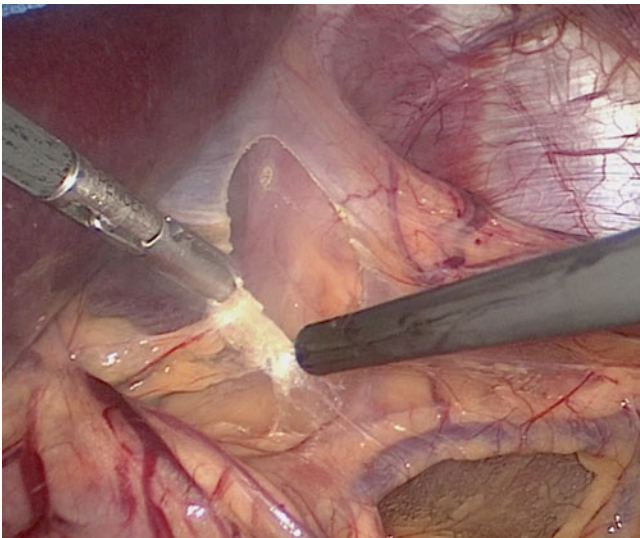


Fig. 13.3 Division of the gastrohepatic ligament

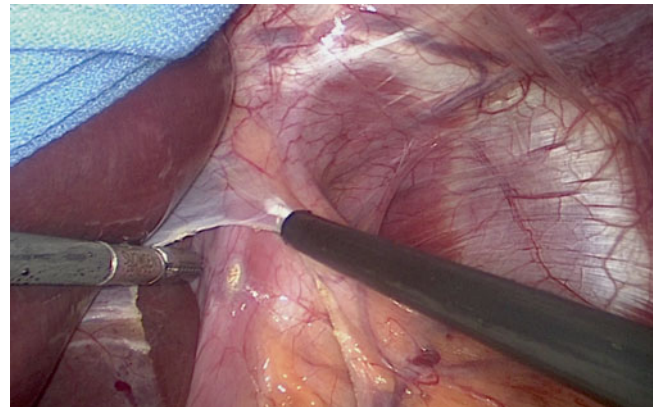


Fig. 13.4 Division of the gastrohepatic ligament

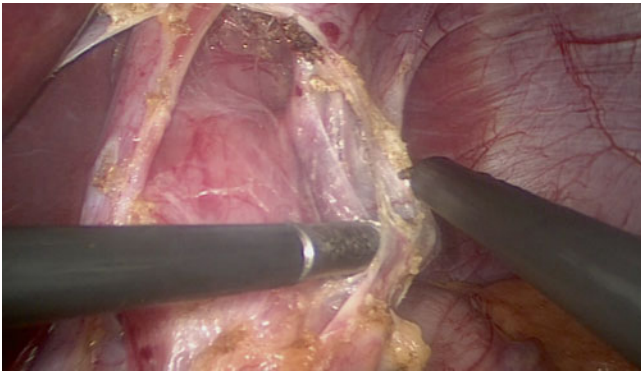


Fig. 13.5 Transection of the peritoneum and the phrenoesophageal membrane above the esophagus, using electrocautery

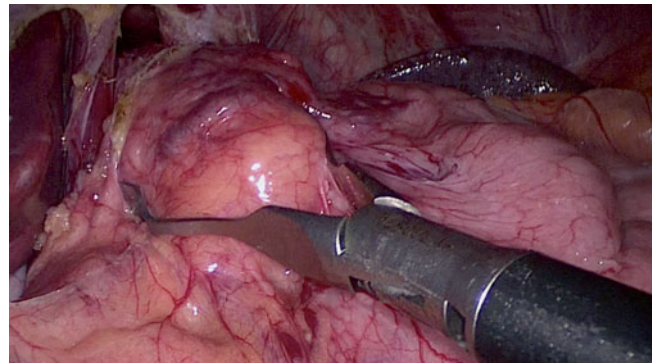


Fig. 13.8 Identification of the gastric component of the tumor

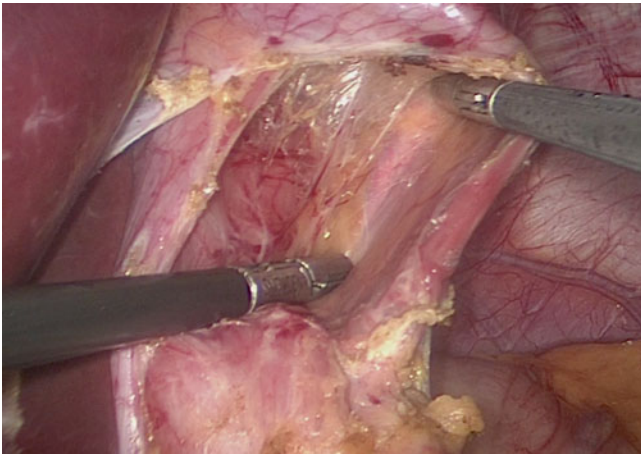


Fig. 13.6 The left crus of the diaphragm is dissected downward toward the junction with the right crus

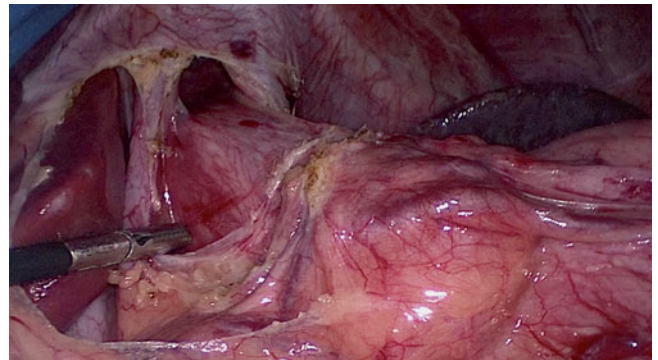


Fig. 13.9 Division of the short gastric vessels

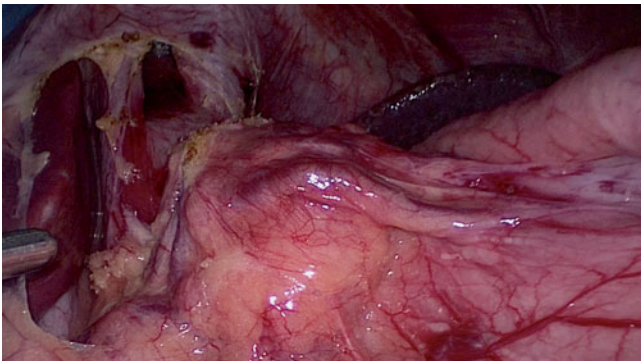


Fig. 13.7 Identification of the gastric component of the tumor

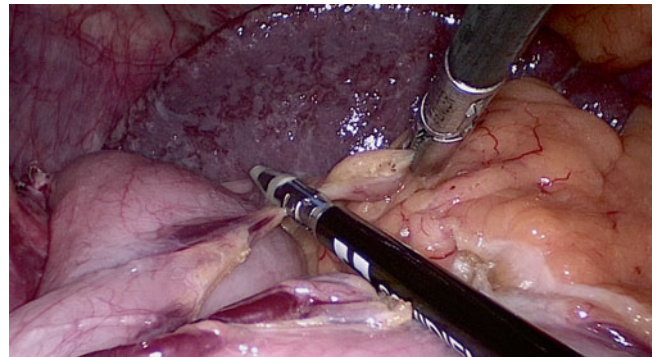


Fig. 13.10 Division of the short gastric vessels

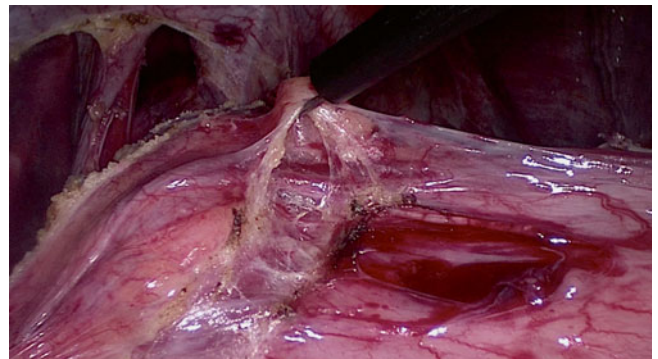


Fig. 13.11 Dissection of the gastric component of the tumor

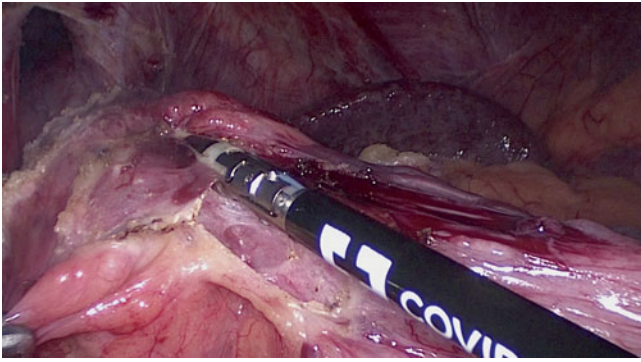


Fig. 13.12 Dissection of the gastric component of the tumor

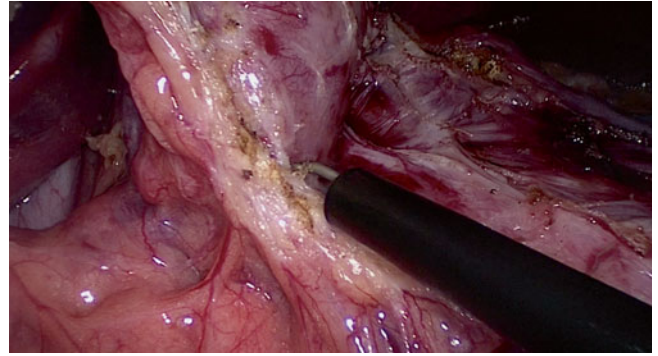


Fig. 13.16 Dissection of the gastric component of the tumor

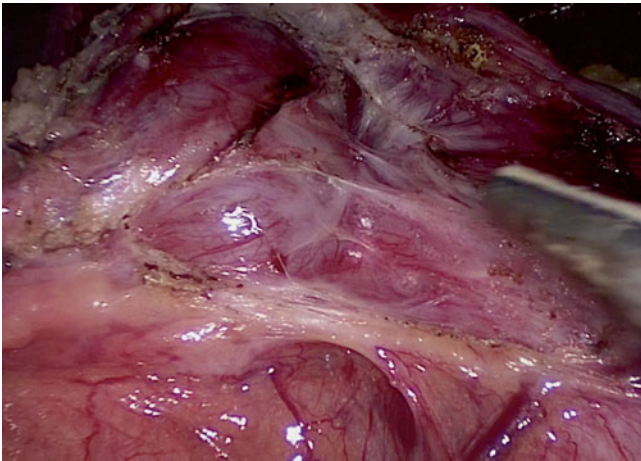


Fig. 13.13 Dissection of the gastric component of the tumor

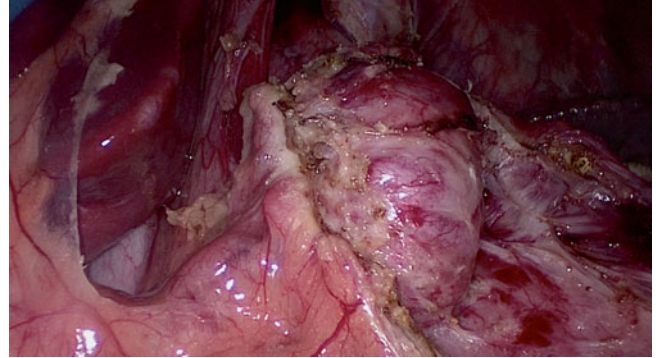


Fig. 13.17 Dissection of the gastric component of the tumor

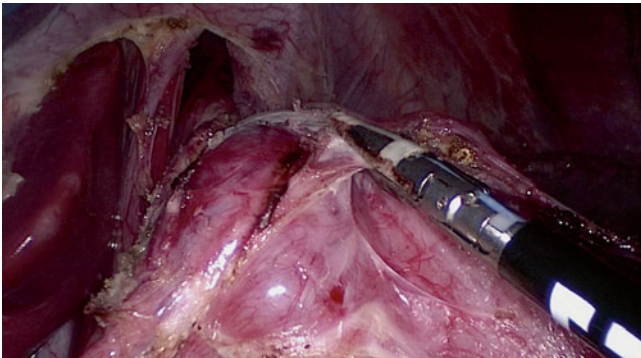


Fig. 13.14 Dissection of the gastric component of the tumor

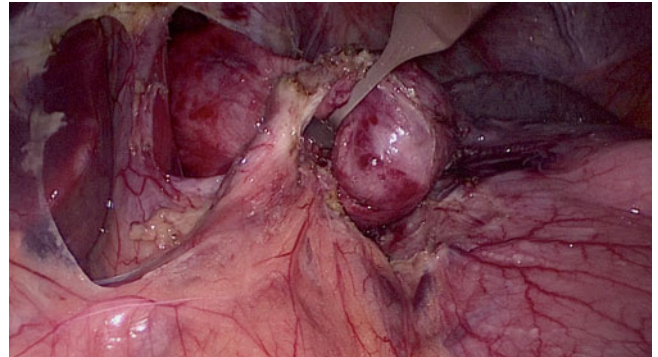


Fig. 13.18 Dissection of the gastric component of the tumor

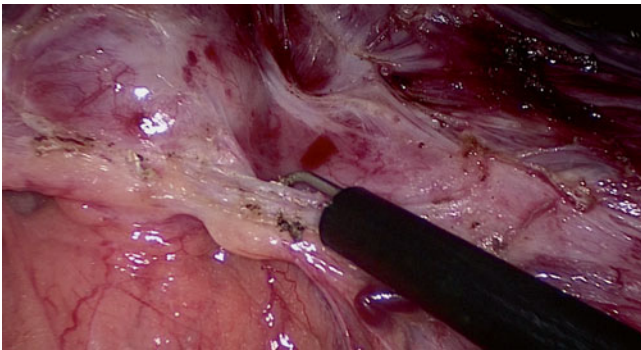


Fig. 13.15 Dissection of the gastric component of the tumor

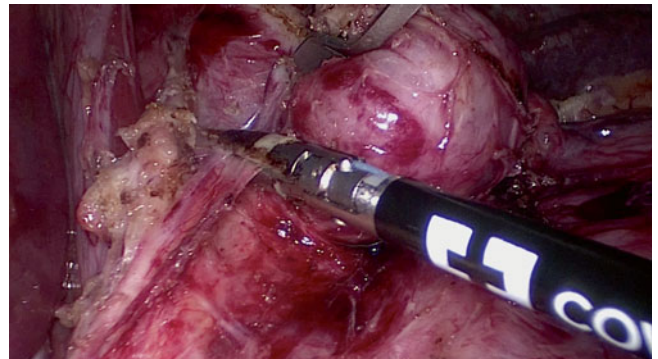


Fig. 13.19 Dissection of the gastric component of the tumor

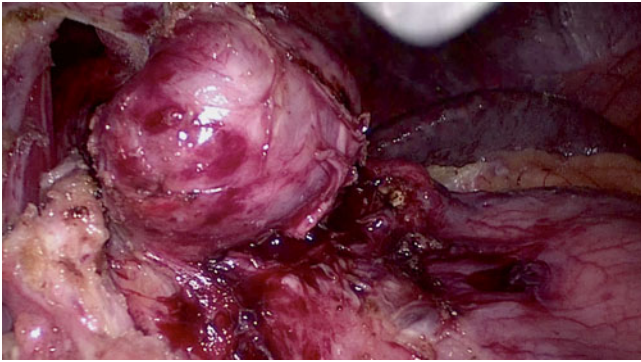


Fig. 13.20 Dissection of the gastric component of the tumor

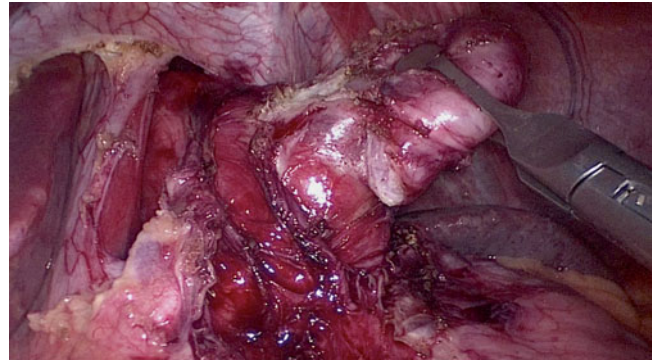


Fig. 13.23 Dissection of the esophageal component of the tumor

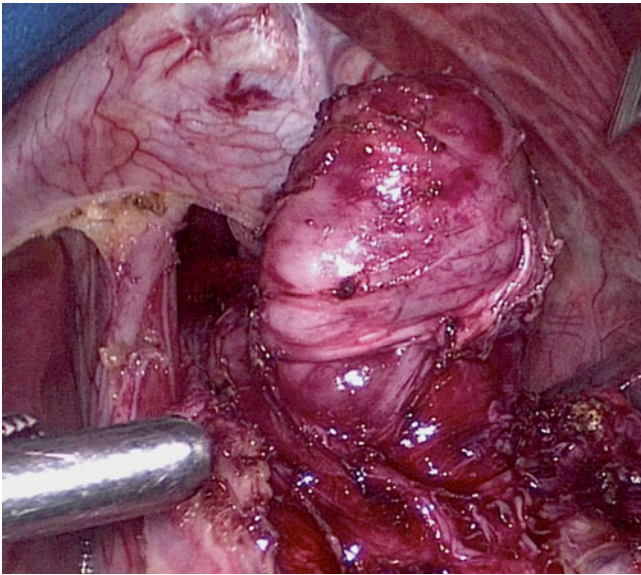


Fig. 13.21 Dissection of the esophageal component of the tumor

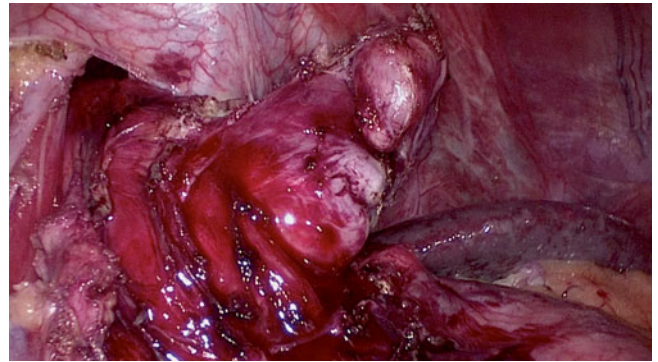


Fig. 13.24 Dissection of the esophageal component of the tumor

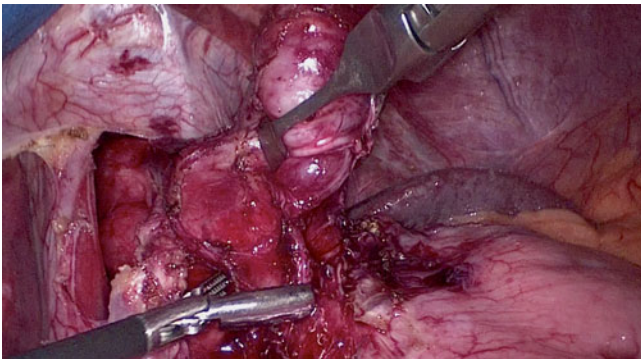


Fig. 13.22 Dissection of the esophageal component of the tumor

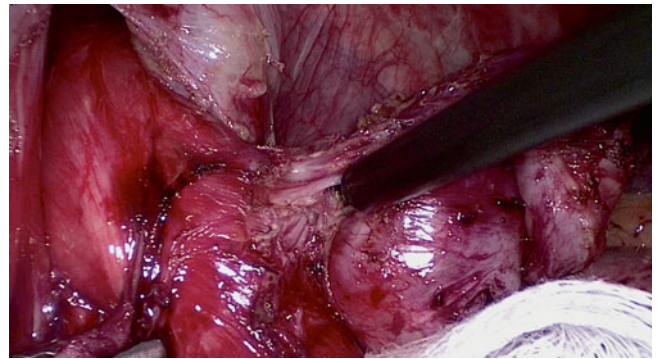


Fig. 13.25 Dissection of the esophageal component of the tumor

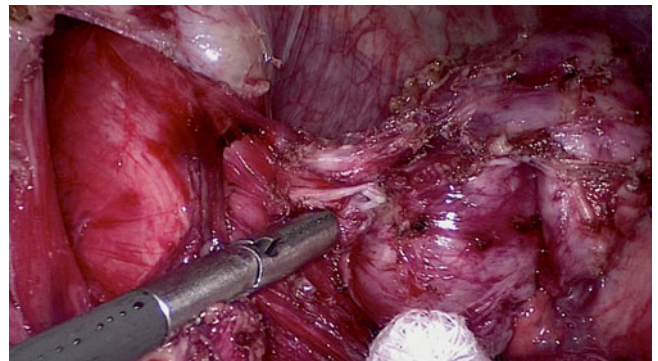


Fig. 13.26 Dissection of the esophageal component of the tumor

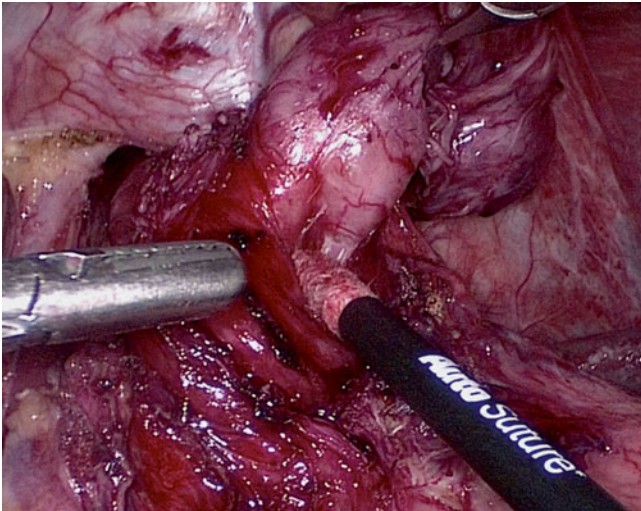


Fig. 13.27 Dissection of the esophageal component of the tumor

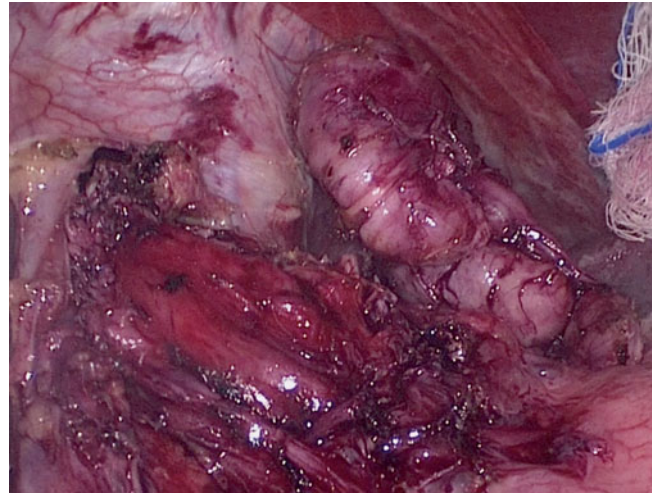


Fig. 13.30 Dissection of the esophageal component of the tumor. The submucosa is exposed completely

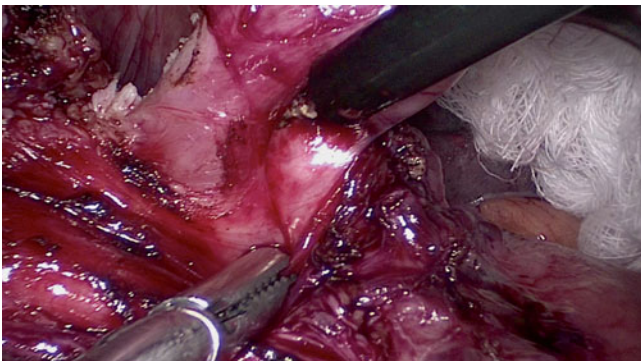


Fig. 13.28 Dissection of the esophageal component of the tumor



Fig. 13.31 Inspection of the esophageal submucosa

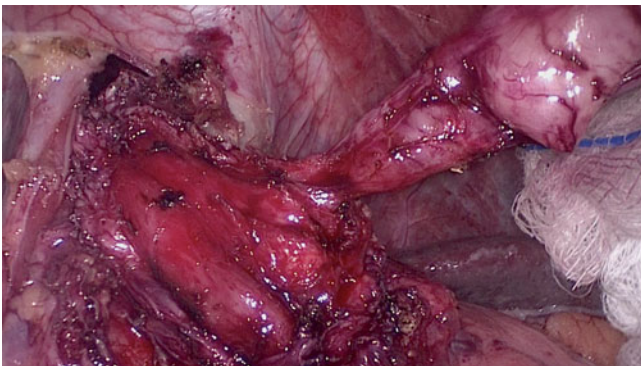


Fig. 13.29 Dissection of the esophageal component of the tumor

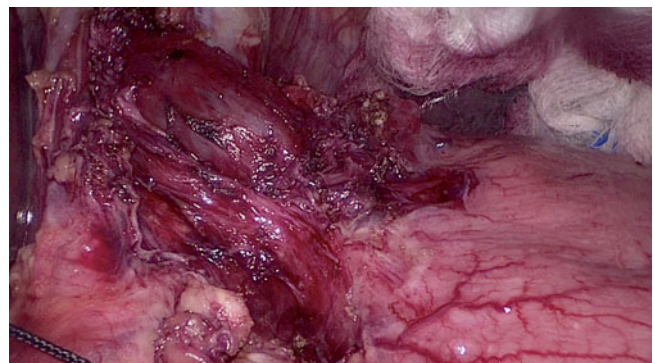


Fig. 13.32 Inspection of the esophageal mucosa

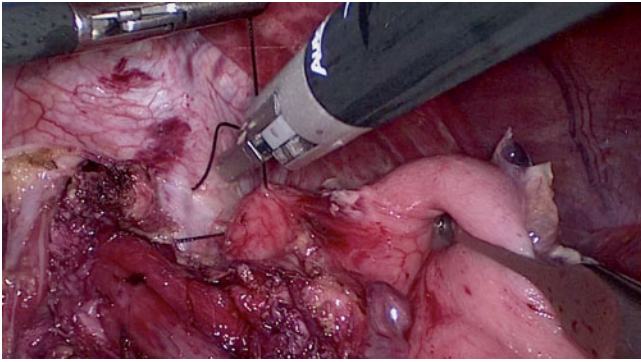


Fig. 13.33 Creation of an anterior partial fundoplication (Dor fundoplication). Left row of sutures

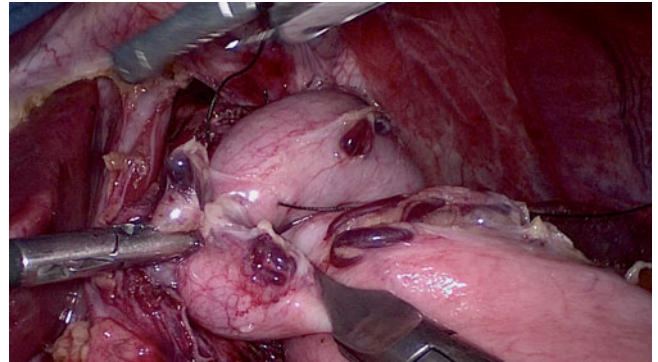


Fig. 13.36 Creation of an anterior partial fundoplication (Dor fundoplication). Right row of sutures

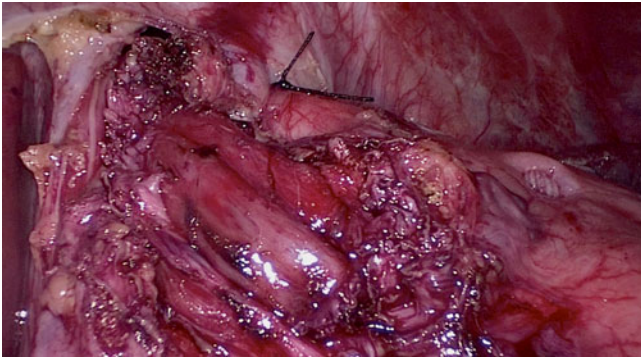


Fig. 13.34 Creation of an anterior partial fundoplication (Dor fundoplication). Left row of sutures

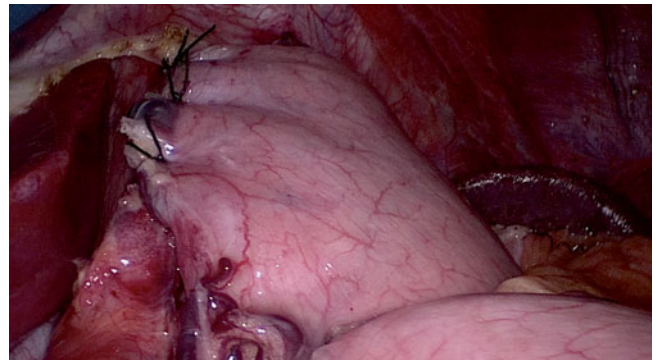


Fig. 13.37 Creation of an anterior partial fundoplication (Dor fundoplication). Right row of sutures

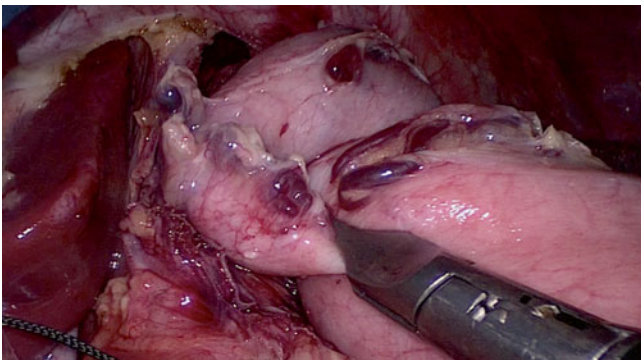


Fig. 13.35 Creation of an anterior partial fundoplication (Dor fundoplication). The fundus of the stomach is folded over the submucosa

13.3 Postoperative Course

The patient was extubated in the operating room and admitted to a surgical unit. She had liquids for breakfast on the first postoperative day. She tolerated a soft diet for lunch and dinner, and she was discharged home the morning of postoperative day 2. Pathology showed a leiomyoma.

The patient has been doing well for 2 years since the operation, with no evidence of recurrence of the tumor, heartburn, or dysphagia.

Acknowledgement Images taken with SPIES system. Courtesy of Storz.

Selected Reading

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