How to avoid esophageal perforation while performing laparoscopic dissection of the hiatus

G. B. Cadière, J. Himpens, J. Bruyns

Department of Gastrointestinal Surgery, Saint-Pierre Hospital, 322 rue Haute, 1000 Brussels, Belgium

Received: 18 March 1994/Accepted: 14 October 1994

Abstract. An increasing number of surgeons attempt advanced laparoscopic procedures, involving the distal esophagus such as Nissen fundoplication, truncal vagotomy, and Heller's myotomy. At this time, there are probably as many techniques as there are surgeons. The authors have tried to provide a "ready to use" universal strategy that details how to approach the distal esophagus while avoiding the dangerous pitfalls of surgery in that area.

Key words: Laparoscopic Nissen fundoplication — Oesophageal perforation

Improved postoperative comfort, decreased parietal morbidity, and a shorter hospital stay are obvious advantages after laparoscopic procedures involving access to the esophageal hiatus [1, 3]. These improvements are thanks to the avoidance of a large laparotomy incision and of a sustained retraction of the costal arch. However there have been reports of dramatic complications [2] due to esophageal perforations, most likely caused by the use of very rigid and sharp instruments instead of the delicate fingers of a surgeon. A technique is proposed to avoid these perforations.

Technique

The patient is put under general anesthesia with endotracheal intubation. A nasogastric sump tube (Salem No. 18) is inserted. The operation table has a 20° reversed Trendelenburg tilt. The surgeon stands between the patient's legs. The second assistant on his right side. Five trocars (Ethicon, Inc., Somerville, MA) are needed for the operation (Fig. 1): a 10-mm trocar well above the umbilicus, a 5-mm trocar in the right subcostal area, a 5-mm trocar in the left subcostal area, a 10-mm trocar under the xiphoid appendix. They allow the introduction of a 30° laparoscope (Olympus optical, Tokyo, Japan), a liver retractor, a coagulation hook, and a second grasping forceps. The second assistant retracts the left hepatic lobe and thus exposes the esophageal hiatus. From here on, our strategy is (Fig. 2):

1. The lesser omentum is widely opened at the cost of extragastric vagal branches if necessary for exposure. The right pillar of the hiatus can now be seen.

2. The peritoneal sheet covering the phreno-esophageal ligament is incised. This ligament is not entirely transected, so as to escape the risks of damaging the anterior wall of the esophagus. Indeed, the correct plane of division between ligament and esophagus is not yet visible at this stage.

3. The incision is taken to the left where the phrenogastric ligament is reached and severed. This latter dissection is facilitated by the 30° angled laparoscope. Once this peritoneal layer has been incised, mobilization of the esophagus can be performed without further dissection of the immediate periesophageal surroundings.

4. The right pillar of the crus is dissected from top to bottom, until the lowermost part of the left pillar is reached. This, again, can only be done if the previously performed incision of the lesser omentum is wide enough. A forceps coming from the top trocar is now inserted in the angle between the right crus and the esophagus. The stomach is pulled caudally and laterally. By way of this maneuver, the left pillar is now dissectable. Localizing the left pillar is essential before any further dissection of the retro-
Fig. 1. Display of trocars and instruments for performing dissection of the esophageal hiatus.

Fig. 2. Suggested sequence of steps for optimal dissection of the esophageal hiatus.