



Thoracoscopic and laparoscopic oesophagectomy improves the quality of extended lymphadenectomy

G. B. Cadière, R. Torres, G. Dapri, E. Capelluto, B. Hainaux, J. Himpens

Department of Gastrointestinal Surgery, European School of Laparoscopic Surgery, Saint-Pierre University Hospital, Brussels, Belgium

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Abstract

Background: Oesophagectomy with extended lymphadenectomy carries considerable morbidity due to parietal trauma. It is also technically extremely demanding because the difficult access even through a large thoracotomy requires the use of long instruments to reach the deepest recess in the chest cavity. Since the first thoracoscopic oesophagectomy reported by Cuschieri et al. [1] in 1992, different minimally invasive approaches have been proposed [2–12]. The aim of this video is to show the accurate and relative ease of an entirely thoracoscopic and laparoscopic oesophagectomy with an extended lymph node dissection of mediastinum in prone position (thoracoscopically) and celiac trunk (laparoscopically).

Methods: Oesophagectomy by thoracoscopy, laparoscopy and cervicotomy was proposed in a 63-year-old man with a lower third oesophageal cancer. General anaesthesia was performed with a double-lumen endotracheal tube and the patient was placed in prone position. Surgeons were positioned at the right side of the patient. Only three trocars were needed. A 10 mm 30-degree angled scope was inserted in the 7th intercostal space on the posterior axillary line and the remaining two 5 mm trocars were inserted in the 5th and 9th intercostal spaces on the posterior axillary line. Prone position allows an excellent visibility of the operative field even in an only partially deflated lung. In order to achieve a good exposure, transitory pneumothorax with CO₂ (14 mmHg) was performed. The mediastinal pleura overlying the oesophagus was incised and the arch of azygos vein was isolated, ligated and divided. The oesophagus was circumferentially mobilized from the thoracic inlet down to oesophageal hiatus. Para oesophageal and subcarinal lymph nodes were dissected so as to remain in block with the surgical specimen. A 28 F chest tube was inserted in the 8th intercostal space on the anterior axillary line. In the second stage the patient was placed in supine position and pneumoperitoneum was established. Five trocars were placed along an ideal semicircular line, with the

concavity facing the subcostal margin and a 30-degree angled laparoscope was used. The lesser omentum was widely opened up the right pillar of the hiatus. Mobilization of the greater curvature of the stomach was performed preserving the right gastroepiploic artery. A wide Kocher maneuver was performed. Celiac lymphadenectomy started with skeletonization of the hepatic artery until the root of left gastric artery was reached. This artery and the left gastric vein were dissected, clipped and sectioned. All fatty tissue and lymph nodes along hepatic artery, left gastric artery and celiac trunk were resected in block with the surgical specimen. Multiple applications of a linear endoscopic stapler were used to create the gastric tube. Finally the distal oesophagus was dissected, until the thoracoscopic dissection field was joined. In the third stage a left lateral cervicotomy was performed and the cervical oesophagus was dissected down to the thoracoscopic dissection plane. Oesophagus and stomach were delivered through the cervical incision and an oesophagogastric anastomosis was created by a linear stapler technique. Cervical and abdominal drainages were installed.

Results: The total operative time was 271 minutes (thoracoscopy: 106 minutes, laparoscopy 120 minutes and cervicotomy 45 minutes) and blood loss was about 100 ml. Histological examination demonstrated a squamous cell carcinoma. Both margins of resection were free of tumour and 29 lymph nodes were retrieved. The final stage was IIA (pT3N0Mx).

Conclusions: Thoracoscopic and laparoscopic oesophagectomy with extended lymphadenectomy is technically feasible and safe. Thoracoscopic oesophagectomy in prone position improves the quality of dissection because:

- The oesophagus and aorto-pulmonary window are reached under excellent visibility, despite a partially deflated lung, which because of gravity will always remain out of harm's way. For the same reason small to moderate bleeding will not obscure the operative field.
- Dissection with the long endoscopic instruments is more accurate due to the support provided by the

entrance site at the parietal level and the ergonomic position of surgeon.

Key words: Oesophagectomy — Thoracoscopy — Laparoscopy — Lymphadenectomy — Oesophageal cancer

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