

Uniportal video-assisted thoracic surgery Ivor Lewis esophagectomy

Sekhniaidze Dmitrii, Agasiev Malik

Department of Thoracic Surgery, Regional Clinic Hospital, Tyumen, Russia

Correspondence to: Sekhniaidze Dmitrii. Department of Thoracic Surgery, Regional Clinic Hospital, Tyumen, Russia. Email: skirrr@mail.ru.

Abstract: Esophageal cancer is one of the most debilitating diseases, and treatment of patients with this medical condition is considered to be one of the most complicated problems in clinical oncology. The up-to-date tendency of bringing minimally-invasive surgeries into more widespread use makes it necessary to invent new techniques to solve some or other tasks including those accompanying esophageal diseases. This article shows our innovation minimally-invasive technique of Ivor Lewis esophagectomy.

Keywords: Video-assisted thoracic surgery (VATS); uniportal; laparoscopy; esophagectomy; minimal invasive; thoracic surgery

Received: 01 August 2016; Accepted: 28 September 2016; Published: 20 October 2016.

doi: 10.21037/jovs.2016.10.01

View this article at: <http://dx.doi.org/10.21037/jovs.2016.10.01>

Introduction

Minimally-invasive esophagectomy (MIE) has been widely used over the last decade for esophageal cancer. There is some consistent data that this procedure could decrease the incidence of respiratory complications, the length of hospital-stay the blood loss (1,2).

This procedure includes a big mix of several techniques including hybrid techniques, full MIE and robotic surgery. Most publications demonstrate a multiport approach to the thoracic step (3). However, this step can be performed by only one incision.

Patient selection and workup

A 57-year-old male patient complained of dysphagia of 5 months' duration, lost 10 kg of weight. The patient's condition was satisfactory. His BMI was 23. The hemodynamic parameters were stable. Comorbidity: arterial hypertension.

Examined, underwent esophagogastroduodenofibrosocopy (EGDS) that revealed tumor at the distance of 35 cm from the incisor teeth in the lower thoracic esophagus obstructing ½ of the lumen. Biopsy was taken and pathologist reported a squamous cell cancer. CT scan chest showed a thickened wall of the lower thoracic esophagus, with the tumor length (size?) of 45 mm. The staging was performed after

postoperative pathological examination, the stage revealed pT3 N0 M0.

Pre-operative preparation

The patient was scheduled for the surgery which was planned as Uniportal VATS esophagectomy. Right before the surgery all the necessary monitoring lines were inserted. A double lumen endotracheal tube was used with general anesthesia. A nasogastric tube was inserted.

Equipment preference card

We used an endoscopic system with a 10 mm 30 degrees FullHD camera (KarlStorz®), a standard laparoscopic instrument set, double articulating long-shafted thoracoscopic instruments (Scanlan®). We utilized staplers (Endo GIA, NTLS), clip applicators, clips, harmonic energy device (Ethicon®).

Procedure (Figure 1)

The first step of the surgery is abdominal, performed using the laparoscopic technique. The patient was positioned supine. Four ports were created. The 10 mm camera port



Figure 1 The video illustrates the key steps performed during a minimally invasive Lewis procedure (4).

Available online: <http://www.asvide.com/articles/1204>

was placed in the left upper quadrant 6 to 8 cm from the umbilicus. The 10 mm liver retractor port was placed just inferior to the xiphoid process. Two 5 mm operating ports were placed in the epigastrium and a 10 mm retraction port was placed laterally in the left upper quadrant.

The abdomen cavity was explored to exclude any peritoneal implants of the tumor and associated pathology. There were not any contraindications revealed for the conduct of the surgery.

The stomach was mobilized. The omentum was divided from the greater curvature preserving the right gastroepiploic arcade. The left gastroepiploic vessels were divided. A liver retractor was placed to permit elevating the left liver lobe.

The gastrohepatic ligament was divided. In this patient's case there was an aberrant left hepatic artery found which was a branch of the left gastric artery. Mobilizing and dividing the left gastric artery branches were performed with the aberrant left hepatic artery being preserved.

The peritoneum was divided along the right crus, anteriorly across the esophagus, and along the left crus. The retroperitoneal attachments to the stomach were divided. The short gastric vessels were divided.

The mobilization of the stomach as well as the standard two fields' lymphadenectomy with the dissection of proximal perigastric lymph nodes, including left gastric artery nodes and celiac axis nodes, were completed successfully.

Once mobilization of the stomach was completed, the abdominal part of esophagus was divided by endostapling.

After that 4 cm mini-laparotomy incision was made. The mobilized stomach was delivered. A standard gastric tube

was constructed by excising the lesser gastric curvature by the linear staplers. The staple line was covered by the second layer of absorbable sutures (Vikryl 3/0) with an atraumatic needle being used.

The constructed gastric tube was placed in the abdominal cavity, fixed to the esophagus stump. The laparotomy wound was closed.

The second step is thoracic, performed using the uniportal VATS approach.

The patient was put in left lateral decubitus position. 4 cm incision was created in the sixth intercostal space between posterior and middle axillary lines. Camera was placed in posterior part of the incision. The pulmonary ligament was divided. The lower and middle thirds of the esophagus were mobilized. The mediastinal pleura were divided posterior and anterior to the esophagus from the diaphragm to the azygos arch.

After an exploration has been completed, esophageal mobilization begins.

The azygos vein was clipped and divided. The esophagus was mobilized including paraesophageal soft tissue extending to the lung, pericardium, aorta, and opposite pleura.

Standard mediastinal lymphadenectomy was performed including dissection of paratracheal, subcarinal, paraesophageal lymph nodes.

The esophagus was resected with scissors above the azygos vein arch level. The gastric tube constructed before was drawn through the hiatus into the pleural cavity to create anastomosis.

In the proximal part of the stomach tube a 1 cm incision was made. The posterior part of the anastomosis made by the endostapler. Anterior part of the anastomosis performed by two layers. V-lock was used. The nasogastric tube was placed and delivered past the anastomosis zone by the anesthesiologist.

The pleural cavity was drained with a silicone tube (Blake 24 Fr).

Post-operative management

The patient was extubated in the Intensive Care Unit after 3 hours after surgery. The chest tube was removed on postoperative day 2. Parenteral nutrition was given for 4 days after operation. The gastric tube was extracted on day 4 after negative swallow probe. Liquid diet was followed the next day after extraction of gastric tube. Semi-liquid diet

was followed on day 7 and the abdominal cavity drainage tubes were extracted. The patient was discharged on day 9.

Tips, tricks and pitfalls

During the mobilization the esophagus was divided above the vena azygos and pulled down to be delivered from the left mediastinum. It is a useful trick to make the mobilization easier mobilization.

Acknowledgements

None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

doi: 10.21037/jovs.2016.10.01

Cite this article as: Dmitrii S, Malik A. Uniportal video-assisted thoracic surgery Ivor Lewis esophagectomy. Endogastric resection of gastrointestinal stromal tumor. J Vis Surg 2016;2:163.

References

1. Biere SS, van Berge Henegouwen MI, Maas KW, et al. Minimally invasive versus open oesophagectomy for patients with oesophageal cancer: a multicentre, open-label, randomised controlled trial. *Lancet* 2012;379:1887-92.
2. Maas KW, Cuesta MA, van Berge Henegouwen MI, et al. Quality of Life and Late Complications After Minimally Invasive Compared to Open Esophagectomy: Results of a Randomized Trial. *World J Surg* 2015;39:1986-93.
3. Luketich JD, Pennathur A, Awais O, et al. Outcomes after minimally invasive esophagectomy: review of over 1000 patients. *Ann Surg* 2012;256:95-103.
4. Dmitrii S, Malik A. The video illustrates the key steps performed during a minimally invasive Lewis procedure. *Asvide* 2016;3:432. Available online: <http://www.asvide.com/articles/1204>