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Video-assisted thoracic surgery (VATS) hybrid esophagectomy after neoadjuvant treatment – case report

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Abstract

Esophageal cancer is an aggressive malignancy. It is 6th among the leading causes of cancer death and the 8th most common cancer type worldwide. Regarding gender distribution, esophageal cancer is about 2–4 times more frequent among males than females. There are two main histological types; esophageal squamous cell carcinoma is typically localized in the upper-middle esophagus being the most frequent histological type and adenocarcinoma subtype, usually localized in the lower esophagus. Over the past two decades, video-assisted thoracic sur-

gery (VATS) has revolutionized how thoracic surgeons diagnose and treat esophageal diseases. Because of the advancement of surgical laparoscopic and thoracoscopic procedures and endoscopic instrumentation, minimally invasive esophagectomy (MIE) is performed to enhance surgical outcomes and reduce surgical morbidity. Here, we present a case of, video-assisted thoracic surgery hybrid esophagectomy in a 63-year-old patient with esophageal cancer who had received neoadjuvant therapy. Surgical technique: the patient was first placed in the supine position under general anesthesia and double-lumen

intubation. An upper median laparotomy was performed to mobilize and tubulate the stomach conduit. Then we continued with a left lateral decubitus position; 4 cm incision was made in the 5th intercostal space to accommodate the thoracoscopic instruments. The dissection and mobilization of the esophagus were carried out from the esophageal hiatus to the upper thoracic inlet after opening the posterior mediastinal pleura. After this step, the stomach conduit was pulled-up through the esophageal hiatus and laterolateral esophagogastric anastomosis was done in the chest. The postoperative course ended without complications, and the patient was discharged home on the 5th postoperative day. The, video-assisted thoracic surgery hybrid approach is an excellent option for esophageal cancer management, offering a quick recovery and low morbidity.

Keywords: Video-assisted thoracic surgery (VATS), minimally invasive esophagectomy, Ivor Lewis esophagectomy, esophageal cancer

Introduction

Esophageal cancer is a highly aggressive cancer with a poor prognosis. Esophageal carcinoma is the eighth most frequent cancer in the world and the sixth most common cause of cancer-related death. It affects over 450 000 people worldwide, and the rate of occurrence is constantly rising.^{1,2} The 5-year survival rate is around 15–25%, and the best outcomes are associated with early detection of the disease.³ The most common type of esophageal carcinoma is squamous-cell carcinoma, followed by esophageal adenocarcinoma. Histological type squamous cell carcinoma is frequently seen in the upper-middle esophagus, unlike adenocarcinoma, which is commonly found in the lower esophagus. Melanoma, leiomyosarcoma, and small-cell carcinoma are less prevalent types of esophageal carcinoma.

Tobacco use is the most significant risk factor for esophageal cancer. Alcohol use increases the risk of esophageal squamous cell carcinoma, but not adenocarcinoma.^{4,5} Low socioeconomic status, poor oral hygiene, and dietary deficiencies are other key contributors. Symptomatic gastro-esophageal reflux disease (GORD), obesity, Barrett's esophagus, tobacco use, and a diet low in vegetables and fruit are all substantial risk factors for esophageal adenocarcinoma.^{6,7,8}

Surgery remains the first choice for the patients with esophageal cancer without distant metastasis. Despite

advances in chemotherapy and radiotherapy, surgical resection remains the most effective treatment. In operable patients with locally advanced esophageal cancer (T3-T4aN0M0), a multimodality approach consisting of preoperative chemoradiation followed by surgery is recommended.⁹ Esophagectomy is a relatively invasive procedure that may require two or three fields of access, depending on preoperative clinical staging and cancer location, and can result in a variety of postoperative complications. Due to the advancement of surgical laparoscopic and thoracoscopic procedures and endoscopic instruments, minimally invasive esophagectomy (MIE) has been used since the 1990s to improve surgical outcomes and reduce surgical morbidity.¹⁰ There have been several hybrid and minimally invasive surgical approaches established; the most commonly used technique is thoracoscopic esophageal mobilization (minimally invasive surgical technique that uses a video camera and specialized instruments inserted through small incisions in the chest to diagnose and treat conditions) followed by laparoscopy or upper median laparotomy and cervical anastomosis.¹¹

Case presentation

The patient was a 63-year-old woman, who had suffered from persistent dysphagia for the last six months, accompanied by weight loss. She was diagnosed with esophageal adenocarcinoma by biopsy samples during esophagoscopy. Computed tomography showed a mass in the lower part of the esophagus with retroperitoneal lymph node enlargement with clinical stage of T3N1M0. After four cycles of neoadjuvant chemotherapy - FLOT protocol (fluorouracil, leucovorin, oxaliplatin and docetaxel), she came to our department to re-evaluate her treatment. She had another diagnostic CT scan three days after induction therapy to confirm the size and location of the lesion. A positron emission tomography (PET) scan was also performed to rule out metastases, clinically there was no evidence of nodule involvement. All these factors pointed to the possibility of surgical resection of the case, and indicated that the patient would benefit from a VATS esophagectomy with an upper median laparotomy.

Surgical technique

The patient was placed in the supine position first, under general anesthesia and double-lumen intubation. An upper median laparotomy was used for the

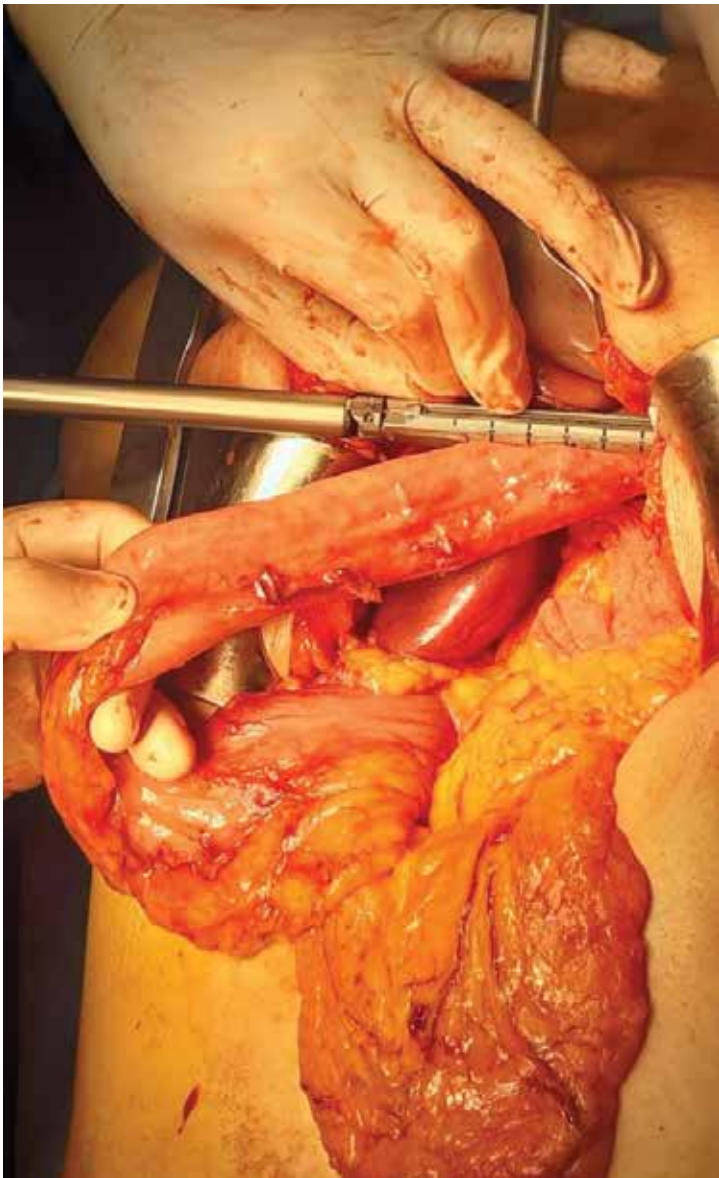


Figure 1

mobilization and tubulization of the stomach conduit. By cutting away the cardias and the lesser curvature

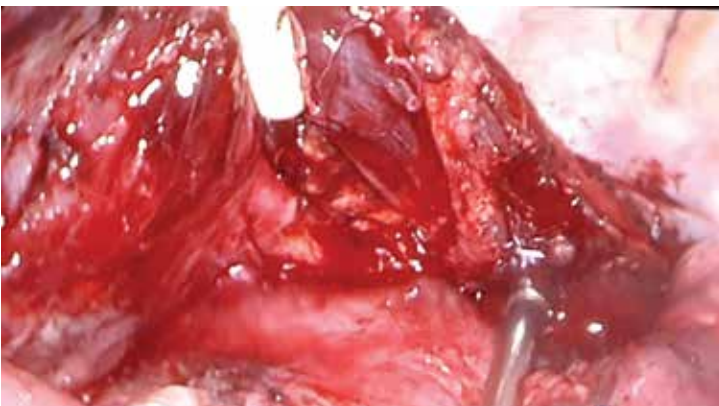


Figure 2: Mobilization of esophagus

with an Endo stapler, the right gastroepiploic vessels are preserved, and the stomach conduit is created along the greater curvature (Figure 1). A pyloroplasty was performed, as well as a total abdominal lymphadenectomy. After removing the esophagus, the stomach conduit was pulled up through the esophageal hiatus, along the posterior mediastinum, and anastomosed in the chest.

Then we continued with a left lateral decubitus position. The patient's vital signs were followed and recorded throughout the operation. A 4 cm incision was made in the 5th intercostal space to accommodate the thoracoscopic instruments. The second port was created in the eighth intercostal space to facilitate the manipulation of an endoscope and equipment, as well as the insertion of a chest tube at the conclusion of the procedure. After opening the posterior mediastinal pleura, the esophagus was dissected and mobilized from the esophageal hiatus to the upper thoracic inlet (Figure 2). An endoscopic stapler was used to dissect and divide the azygos vein (Figure 3). After this step, the stomach conduit was pulled-up through the esophageal hiatus and laterolateral esophagogastric anastomosis was done in the chest. In the end, we underwent a total mediastinal lymph node dissection.

The postoperative course was without complication. The chest tube was removed on postoperative day 5, and the patient was discharged on the same day.

Discussion

When compared to open esophagectomy, minimally invasive esophagectomy surgical procedures showed oncological results per stage that were comparable to open esophagectomy and could offer less pain, shorter hospital stays, and enhanced quality of life.¹² Using VATS in patients with advanced cancer, especially after



Figure 3: VATS dissection



Figure 4: Surgical specimen of esophagus *en-bloc* with cardias and upper gastric pole.

neoadjuvant treatment, is more challenging for surgeons.

A minimally invasive method appears to be preferable in terms of perioperative outcomes in patients with esophageal adenocarcinoma following neoadjuvant chemotherapy, allowing faster physical recovery for patients. The oncological efficacy of such procedures is comparable to open surgery in terms of overall survival and disease-free survival.¹³ The UK Medical Research Council Esophageal Cancer Working Group research, one of the largest randomized trials to date, indicated that chemotherapy before surgery significantly improved 3-year survival compared to surgery alone.¹⁴ Endoscopic treatments in esophagectomy represent a valid therapeutic option in patients with locally advanced neoplastic disease after neoadjuvant chemotherapy, result of technological developments in minimally invasive surgery.

REFERENCES

1. Jemal A, Siegel R, Ward E, Hao Y, Xu J, Thun MJ. Cancer statistics, 2009. *CA: A Cancer Journal for Clinicians*. 2009;59(4):225-249. doi:10.3322/caac.20006
2. Enzinger PC, Mayer RJ. Esophageal cancer. *N Engl J Med*. 2003;349(23):2241-2252. doi: 10.1056/nejmra035010.
3. Pennathur A, Gibson MK, Jobe BA, et al. Oesophageal carcinoma. *The Lancet*. 2013;381:400-12. doi: 10.1016/S0140-6736(12)60643-6.

4. Gammon MD, Ahsan H, Schoenberg JB, et al. Tobacco, Alcohol, and Socioeconomic Status and Adenocarcinomas of the Esophagus and Gastric Cardia. *JNCI: Journal of the National Cancer Institute*. 1997;89(17):1277-1284. doi: 10.1093/jnci/89.17.1277
5. Lee CH, Wu DC, Lee JM, et al. Carcinogenetic impact of alcohol intake on squamous cell carcinoma risk of the oesophagus in relation to tobacco smoking. *European Journal of Cancer*. 2007;43(7):1188-1199. doi:10.1016/j.ejca.2007.01.039
6. Lagergren J. Association between Medications That Relax the Lower Esophageal Sphincter and Risk for Esophageal Adenocarcinoma. *Annals of Internal Medicine*. 2000;133(3):165. doi:10.7326/0003-4819-133-3-200008010-00007
7. Poynton AR, Walsh TN, O'Sullivan G, Hennessy TP. Carcinoma arising in familial Barrett's esophagus. *The American Journal of Gastroenterology*. 1996;91(9):1855-1856.
8. Anderson LA. Risk factors for Barrett's oesophagus and oesophageal adenocarcinoma: Results from the FINBAR study. *World Journal of Gastroenterology*. 2007;13(10):1585. doi: 10.3748/wjg.v13.i10.1585
9. Kuwano H, Nishimura Y, Oyama T, et al. Guidelines for Diagnosis and Treatment of Carcinoma of the Esophagus April 2012 edited by the Japan Esophageal Society. *Esophagus*. 2015;12:1-30. doi: 10.1007/s10388-014-0465-1
10. Cuschieri A, Shimi S, Banting S. Endoscopic oesophagectomy through a right thoracoscopic approach. *J R Coll Surg Edinb*. 1992;37:7-11.
11. Luketich JD, Alvelo-Rivera M, Buenaventura PO, et al. Minimally invasive esophagectomy: outcomes in 222 patients. *Ann Surg*. 2003;238:486-94. doi: 10.1097/01.sla.0000089858.40725.68
12. JD Luketich, A Pennathur, O Awais, et al. Outcomes after minimally invasive esophagectomy: review of over 1000 patients. *Ann Surg*. 2012; 256(1):95-103. doi: 10.1097/SLA.0b013e3182590603
13. Berger AC, Bloomenthal A, Weksler B, Evans N, Chojnacki KA, Yeo CJ, Rosato EL, Oncologic efficacy is not compromised, and may be improved with minimally invasive esophagectomy. *J Am Coll Surg*. 2011;212(4):560-566. doi:10.1016/j.jamcollsurg.2010.12.042
14. Medical Research Council Oesophageal Cancer Working Group. Surgical resection with or without preoperative chemotherapy in oesophageal cancer: a randomised controlled trial. *The Lancet*. 2002; 359 (9319): 1727-1733. doi: 10.1016/s0140-6736(02)08651-8