Minimally Invasive Esophagectomy by Video-Assisted Thoracoscopic Approach for Esophageal Carcinoma. A Case Report

Géza Molnár¹, Nadim Al Hajjar¹, Irén Géczi Toth², Nicoleta Nicolescu³, Cornel Iancu³

¹) 3rd Surgical Clinic, Clinical Hospital. ²) Department of Anesthesia and Intensive Care and ³) 3rd Surgical Clinic, University of Medicine and Pharmacy, Cluj Napoca

Abstract

Esophageal carcinoma represents a pathological entity with a bad prognosis even if adequate multimodal treatment is applied. Because of the high operative morbidity and mortality, due especially to respiratory and infectious complications, the tendency nowadays is to mobilize the thoracic esophagus and to perform esophagectomy and mediastinal lymphadenectomy by thoracoscopy instead of thoracotomy. We present the case of a 55-year-old male patient who was diagnosed with a mediastinal esophageal spinocellular carcinoma, in whom we successfully performed subtotal esophagectomy by cervico-thoraco-abdominal approach, the dissection of the thoracic esophagus being performed entirely by thoracoscopy.

Key words

Esophageal carcinoma - thoracoscopic esophagectomy - good postoperative evolution

Introduction

Esophageal cancer is the 7th most frequent among solid cancers in the world, epidermoid or squamos cell carcinoma being the most common histological type. Incidence is the highest in the 6th and 7th decade and it is more frequent in males then in females.

Surgery is the therapy of choice in resectable cases, while neoadjuvant and adjuvant chemo-radiotherapy seems to have smaller impact on survival and local recurrence. Thoracoscopy and laparoscopy are yet important techniques in the correct staging of this malignancy and tend to be the methods of choice for the resection of tumoral esophagus.

Case report

A 55-year-old male patient was admitted to the 3rd Surgical Clinic of Cluj in February 2006. He presented progressive dysphagia grade 2 and weight loss of about 8 kg in 6 weeks. Upper digestive endoscopy showed a tumoral obstruction 30 cm below the dental arch, which could not be passed by the endoscope. Biopsies evidenced squamous cell carcinoma.

The patient had been a heavy smoker and alcohol consumer, without other significant pathology. He presented a slight pallor, reduced subcutaneous tissue and difficulty in the deglutition of solid food. Laboratory examinations evidenced a mild anemia and hypoalbuminemia.

Transparietal conventional ultrasonography did not evidence intraabdominal adenopathy or liver metastasis. The patient had been a heavy smoker and alcohol consumer, without other significant pathology. He presented a slight pallor, reduced subcutaneous tissue and difficulty in the deglutition of solid food. Laboratory examinations evidenced a mild anemia and hypoalbuminemia.

Transparietal conventional ultrasonography did not evidence intraabdominal adenopathy or liver metastasis. The patient had been a heavy smoker and alcohol consumer, without other significant pathology. He presented a slight pallor, reduced subcutaneous tissue and difficulty in the deglutition of solid food. Laboratory examinations evidenced a mild anemia and hypoalbuminemia.

Radiography with oral barium meal evidenced an asymmetric mediastinal esophageal stenosis 3-4 cm in length, with a slight proximal dilatation (Fig. 1).

Endoscopic ultrasonography was not possible to perform because of the tight stenosis. Computed tomographic examination revealed a tumoral stenosis which started at the level of the tracheo-bronchial bifurcation on a distance of 3 cm. The tumoral mass was in contact with the...
A prophylactic parenteral antibiotic therapy was performed for five days and a feeding jejunostomy was put in place through a median supraumbilical incision. On this occasion we also explored the peritoneal cavity, but we did not find any macroscopic pathological modification.

Enteral feeding was started and oral food intake was entirely stopped. After 10 days of enteral nutrition, albuminemia increased from 3.3g/dl to 4.5g/dl and the patient had gained 2.5 kg in weight.

We decided to perform a thoracoscopic exploration and, if the tumour was considered resectable, to carry out subtotal esophagectomy with thoracoscopic dissection of the tumoral thoracic esophagus.

**Surgical intervention**

The patient was positioned on the operating table in a left decubitus after he was intubated with selective left lung ventilation. A 10 mm scopic trocar was placed in the 7th intercostal space on the middle axillary line and another three 10 and 12 mm trocars were placed under visual control in the 4th and 6th intercostal spaces, on the anterior axillary line and in the 5th intercostal spaces respectively on the posterior axillary line (Fig.4). A 30 degree video optic was used. A lavage cytology was performed without evidencing malignant cellularity.

The intervention started with the dissection and the section of the azygos vein arch between clips (Figs.5,6), and continued with the section of the mediastinal pleura on both sides of the esophagus (Fig.7). An esophageal tumor of approximately 3 cm was found with its superior pole situated 3-4 cm below the azygos arch (Fig.8). The tumour invaded the adventitia and the peri-esophageal tissues, but it was delimited from the other organs, therefore we performed the peritumoural dissection in very good conditions with the monopolar electrocautery hook and scissor (Figs. 9,10). The entire dissection of the thoracic esophagus was carried out thoracoscopically without any events or intraoperative complications (Fig.11). At the end of this part of the intervention, two 24Fr siliconic drains were put in place in the mediastinum.

The cervical esophagus was prepared and sectioned through a left pre-sternocleidomastoidian incision, a supraumbilical laparotomy was performed in order to mobilize the stomach and the esophagoplasty was performed with gastric pull-up and an end-to-side eso-gastro anastomosis with the whole denervated stomach, at the neck. We did not perform a pyloroplasty.

**Evolution**

The patient had a good postoperative evolution. He did not require ventilatory support. Enteral feeding was restarted 12 hours after the intervention, there were no signs of infection.
An eso-gastric passage with hydrosoluble contrast material was performed on the 6th postoperative day, which did not evidence anastomotic leakage, therefore oral nutrition was started on the 8th postoperative day. Jejunostoma was suppressed on the 14th day.
Gastric motility disturbances were present in the first 10 postoperative days, erythromycin in oral administration facilitated gastric emptying, so after that period gastric motility returned to normal. Histopathology showed a moderately differentiated esophageal squamous cell carcinoma with big keratinized cells, which invaded the whole esophageal wall. Circumferential margins were invaded by the tumour, without invasion in longitudinal margins. There was an intense lymphoid defense reaction and there was no evidence of vascular invasion. The peri-esophageal lymph nodes were not invaded, but three of four examined paracardial nodes were affected by the tumour, while one was free.

Consequently we evaluated the tumour in stage III, pT3pN1aM0. The patient was submitted to adjuvant radiotherapy, which was well tolerated.

**Discussion**

In our country most of the esophageal tumours are T3 and T4 at the time of diagnosis, with positive lymph nodes and in many situations with metastatic spread (1).

For the surgeon it is very important to have a good preoperative staging because in stages 0, I, and IIa, the treatment is exclusively surgical. In stages IIb and III chemo-radiation in neo adjuvant or adjuvant manner is mandatory, while in stage IV surgery should just complement other palliation methods (2,3).

Preoperative staging is possible by using computed tomography in association with endoscopic ultrasonography and fine needle aspiration, or, better but more costly, by using positron emission tomography instead of computed tomography (4,5).

Minimally invasive methods such as thoracoscopy and laparoscopy are very good staging methods (6,7), but they should be used not only for preoperative staging but also for radical esophagectomy.

Thoracoscopic esophagectomy is technically feasible and safe in experienced hands (8,9). The completeness of mediastinal lymphadenectomy is comparable to that of the open technique but with less significant pulmonary decline compared to the thoracotomy (10). Perioperative morbidity and mortality seem to be also lower for the minimally invasive technique and the social reinsertion with return to normal activities is shortened.

Our patient was understaged because of the impossibility to perform endoscopic ultrasonography in the presence of a tight stenosis, but the indication of surgery was correct. The diagnostic thoracoscopy followed by thoracoscopic esophagectomy was carried out without any intraoperative events and accidents. The patient had a good postoperative course.

Presence of paracardial lymph nodes indicated the necessity of adjuvant radiotherapy.

The particularity of this case consists mainly in the minimally invasive approach for this pathology. Thoracoscopic esophagectomy should be taken into consideration when possible, though it does not substitute the open technique, even in the best esophageal surgery centers in the world.

**References**