

A rare case of gastroesophageal adenocarcinoma in a 24-year-old male with achalasia complicated by postoperative aorto-esophageal fistula due to stent placement and early local recurrence

Vzácný případ gastroezofageálního karcinomu v 24letého muže s achalázií komplikovanou pooperační aortoezofageální píštělí v důsledku zavedení stentu a časně lokální rekurence

Ioannidis O., Malliora A., Mantzoros I., Loutzidou L., Pramateftakis M.G., Kotidis E., Ouzounidis N., Foutsitzis V., Angelopoulos S., Tsalis K.

Fourth Department of General Surgery, School of Medicine, Aristotle University of Thessaloniki, General Hospital of Thessaloniki "Georgios Papanikolaou", Thessaloniki, Greece

Summary

Background: Esophageal cancer is the 8th most common and 6th most deadly malignancy worldwide. It is an aggressive type of cancer with poor prognosis, despite advances in therapeutic methods including those in thoracoabdominal surgery, chemotherapy and radiotherapy. It rarely manifests in young patients, but occurs frequently in older people. It has been related with achalasia regarding mainly the squamous cell carcinoma rather than the adenocarcinoma. Infiltrating esophageal tumors and radiotherapy can lead to the development of aorto-esophageal fistula, a pathological communication between the aorta and the esophagus. **Case:** We present the case of a 24-year-old male patient with a known history of achalasia for almost 15 years with a history of heavy smoking and drinking that presented with advanced lower esophageal adenocarcinoma. The patient was submitted, as per to his will, directly to Ivor Lewis esophagogastrectomy. One month later, dysphagia was manifested due to stenosis of the anastomosis, without any signs of local recurrence, and an esophageal metallic stent was placed. In the 3rd postoperative month, upper gastrointestinal bleeding presented due to an aorto-esophageal fistula, caused by anastomotic dehiscence due to local recurrence and pressure from the stent, which was treated surgically. The patient, refusing chemotherapy at all stages, developed peritoneal carcinomatosis and died 6 months after surgery. **Conclusion:** Esophageal cancer is an aggressive type of cancer with a poor prognosis that is typically diagnosed in advanced stages. Despite the development of new therapeutic approaches, the high recurrence rate and the poor prognosis remain.

Key words

esophageal cancer – achalasia – aorto-esophageal fistula

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Orestis Ioannidis, MD, MSc, PhD
Fourth Department of General Surgery
School of Medicine
Aristotle University of Thessaloniki
Alexandrou Mihailidi 13
54640 Thessaloniki
Greece
e-mail: iorestis@auth.gr

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Souhrn

Východiska: Rakovina jícnu je osmou nejčastější malignitou na světě a šestou nečastější příčinou úmrtí na maligní onemocnění. Jedná se o agresivní typ rakoviny se špatnou prognózou, a to i přes pokroky v metodách léčby, kam patří torakoabdominální chirurgie, chemoterapie a radioterapie. U mladých lidí se vyskytuje vzácně, ale u starších lidí častěji. Bývá spojena s achalázií, pokud jde hlavně o dlaždicobuněčný karcinom spíše než o adenokarcinom. Infiltrující nádory jícnu a radioterapie mohou vést k rozvoji aortoezofageální píštěle, což je patologické spojení mezi aortou a jícnem. **Případ:** Prezentujeme případ 24letého muže s achalázií v anamnéze po dobu téměř 15 let, silného kuřáka s denní konzumací alkoholu, který přišel s pokročilým adenokarcinomem dolní části jícnu. V souladu s přáním pacienta byla přímo provedena ezofagogastrektomie podle Ivora Lewise. O měsíc později došlo k manifestaci dysfagie v důsledku stenózy anastomózy bez jakýchkoli známek lokální rekurence a byl zaveden ezofageální kovový stent. Třetí měsíc po operaci se projevilo krvácení v horní části gastrointestinálního traktu v důsledku aortoezofageální píštěle vyvolané dehiscencí anastomózy vlivem lokální rekurence a tlaku stentu, což bylo řešeno chirurgicky. U pacienta, který ve všech stadiích odmítl chemoterapii, došlo k rozvoji peritoneální karcinomatózy a pacient zemřel 6 měsíců po operaci. **Závěr:** Rakovina jícnu je agresivní typ nádorového onemocnění se špatnou prognózou a obvykle je diagnostikována v pokročilém stadiu. I přes vývoj nových léčebných postupů přetrvává vysoké procento rekurence a špatná prognóza.

Klíčová slova

ezofageálním karcinom – achalázie – aortoezofageální píštěl

Introduction

Esophageal cancer is the 8th most common and 6th most deadly malignancy worldwide [1]. Over the last 30 years, there has been a dramatic increase in esophageal and gastroesophageal adenocarcinomas compared to squamous cell carcinoma in Western countries [2]. It is an aggressive type of cancer with a poor prognosis that is typically diagnosed in

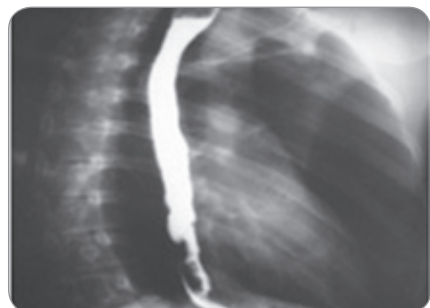


Fig. 1. An upper gastrointestinal barium X-ray showed a stenosis in the lower third of the esophagus and in the area of the gastroesophageal junction.



Fig. 2. Chest and abdominal CT revealed narrowing of the lumen of the lower esophagus, with esophageal wall thickening, as well as partial thickening of the gastric fundus.

advanced stages [3]. The 5-year survival rate ranges from 3 to 62% depending on the disease stage [4]. It rarely manifests in young patients, as it occurs frequently in older people [3]. We present a rare case of a 24-year-old male patient with gastroesophageal junction adenocarcinoma which developed due to esophageal achalasia. As a postoperative complication, he presented with anastomotic stenosis treated with a metallic stent placement, which lead, along with local recurrence, to aortoesophageal fistula development.

Case report

A 24-year-old male, from a rural area, presented to the hospital with inability to swallow solid food, nausea, vomiting and weight loss of 5 kg in the last 15 days. He had a known history of esophageal achalasia from the age of 10, high tobacco consumption of 30–40 cigarettes/day for 8 years and daily alcohol consumption (whiskey, brandy) for 5 years. Chronic dysphagia, regurgitations and vomiting, due to achalasia, affected his diet, which was deficient, as well as his weight.

An upper gastrointestinal (GI) barium X-ray showed a stenosis in the lower third of the esophagus and in the area of the gastroesophageal junction (Fig. 1). Chest and abdominal computer CT revealed narrowing of the lumen of the lower esophagus with esophageal wall thickening as well as partial thickening of the gastric fundus. No swollen mediastinal or subdiaphragmatic lymph

nodes were observed, nor metastatic foci in the chest or abdominal organs (Fig. 2). An upper GI endoscopy revealed a mass in the lower esophagus and the biopsies were positive for esophageal adenocarcinoma.

The preoperative examination showed no pathological findings from the cardiac, renal and pulmonary function, and the blood test was normal. Despite the multidisciplinary team proposal for neoadjuvant chemotherapy the patient's decision was to be submitted directly to surgery. The patient was submitted to Ivor Lewis esophagogastrectomy, with median laparotomy and right thoracotomy, esophagectomy of the lower third of the esophagus and gastrectomy of gastric fundus and body, esophagogastric anastomosis with a circular stapler and pyloroplasty and two-field lymphadenectomy in the lower mediastinum and the abdomen along the celiac artery axis. Frozen biopsy established that an R0 resection has been achieved.

Macroscopically, a solid mass was found in the cardioesophageal junction, consisted with a Siewert type II adenocarcinoma. The pathology report revealed a gastroesophageal junction adenocarcinoma of low differentiation, which infiltrated the entire wall of the esophagus and part of the gastric fundus, as well as an infiltration of lymph nodes, and staged as T3N1M0.

Postoperatively, the patient remained one day at the Intensive Care Unit. Anastomosis was tested one week

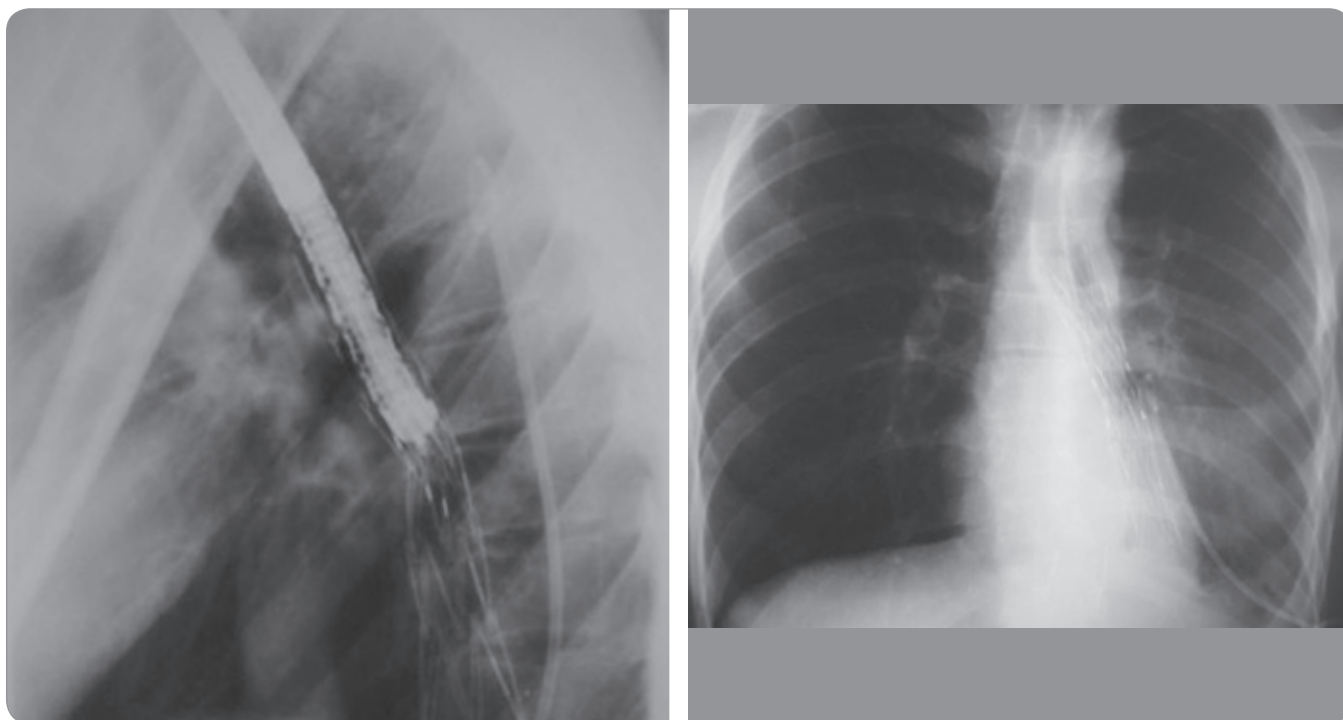


Fig. 3. Esophageal metallic stent successfully placed for the management of the esophagogastric stenosis.

after surgery with a series of upper GI X-rays revealing no anastomotic dehiscence neither stenosis and feeding was gradually started. The postoperative course was uneventful and the patient was discharged on the 25th day. Despite the need for chemotherapy the patient refused further treatment.

One month later, the patient had increasing dysphagia and an esophagoscopy revealed stenosis of the anastomosis but biopsies were negative for local recurrence. Thus, an esophageal metallic stent was placed, which was well tolerated, and the symptoms subsided (Fig. 3).

In the 3rd postoperative month, 2 months after the stent placement he was urgently admitted to the hospital with upper gastrointestinal bleeding and melena, but his vital signs were unaffected and his blood test revealed only a mild anemia. An emergency upper GI endoscopy revealed that the stent was in place but also the presence of clots and some active bleeding that could not be treated endoscopically. The thoracoabdominal CT angiography indicated a suspicion of aorto-esophageal fistula but no signs of local recurrence. So with the possible diagnosis of aorto-esophageal fistula due to the esophageal stent,

the patient was submitted to surgery. At the operation, an aorto-esophageal fistula was detected along with an anastomotic rupture by local tumor recurrence. The stent was removed, complementary esophagogastrectomy was performed with a new esophagogastric anastomosis, while the aorta was sutured as the fistula was small in diameter.

Five months after the first operation, the patient presented with generalized peritoneal carcinomatosis and ascites and died 1 month later.

Discussion

Esophageal cancer is the 8th most common and 6th most deadly malignancy worldwide [1]. In Western countries over the last 30 years, there has been a dramatic increase in esophageal and gastroesophageal adenocarcinomas compared to squamous cell carcinoma [2]. It rarely manifests in young patients but it occurs frequently in patients older than 65 years [3,5], so our 24-year-old patient is an exception. Its main symptoms are dysphagia and weight loss [6].

Obesity, gastroesophageal reflux disease and Barrett's esophagus, smoking, chronic alcohol consumption, male sex, white race, preciously treated ach-

alasia with anti-reflux therapy and genetic predisposition are related to an increase risk of gastroesophageal adenocarcinoma [2,7]. Particularly, obesity has been reported to lead to the manifestation of gastroesophageal cancer at a younger age [8]. Achalasia, a rare disorder (1/100,000 per year in Western countries) [9] of unknown etiology, is also a predisposing factor mainly for squamous cell carcinoma of esophagus, but it has been reported to lead to adenocarcinoma as well [10]. More specifically, it is characterized by aperistalsis in the distal esophagus that prevents the passage of solid and liquid foods to the stomach. Consequently, chronic inflammation, dysplasia and probably esophageal or gastroesophageal cancer occur due to food stasis. Long-standing achalasia increases esophageal and gastroesophageal cancer risk 14–40× compared to the population that does not suffer from this disorder [11]. Specifically, achalasia predisposes more to the development of esophageal squamous cell carcinoma with the prevalence being 26 per 1,000 patients, rather than to esophageal adenocarcinoma with the prevalence being only 4 per 1,000 patients. The incidence of esophageal ad-

enocarcinoma in patients with achalasia has been found to be 21.3 cases per 100,000 patient-years at risk [7]. Our patient had more than one predisposing factors and his reluctance to receive treatment and change his lifestyle have led to adenocarcinoma development in such a young age.

Conventional endoscopy with biopsy sampling is the basic diagnostic method, while high-resolution spiral CT, endoscopy ultrasound (EUS) including EUS guided fine needle aspiration and PET or PET-CT are used to assess the extent of the malignancy. Although EUS accuracy in assessing T3 has been estimated to proximately 90 and 75% for evaluating lymph node involvement, it misclassifies disease extent in 15% of the cases. PET has added diagnostic value to the diagnosis of distant metastases non-visible by conventional methods. Despite advances in diagnostic methods, gastroesophageal cancer is still being diagnosed at an advanced stage. Eighty percent of patients have stage T3/T4 at the time of diagnosis, such as our patient, while 80% among them have infiltrated lymph nodes and 50% distant metastases [6].

The treatment of choice for gastroesophageal adenocarcinoma early stages is surgical [2], while surgery following neoadjuvant chemoradiotherapy is thought to be the most effective treatment in locally advanced stages [12]. Chemotherapy is also used for advanced cancer [4]. Nowadays, intensive research is being conducted in order to find new treatments for aggressive tumors. The focus is on molecular biology of cancer and more specifically on macromolecules such as the receptor tyrosine kinases, epidermal growth factor receptor, human epidermal growth factor receptor 2 (HER-2) and the vascular endothelial growth factor [13]. Despite advances in therapeutic methods including those in thoracoabdominal surgery, chemotherapy, radiotherapy, and more recently the anti-HER2 agent trastuzumab, the prognosis remains poor [14]. The five-year survival rate ranges from 3 to 62% depending on the disease stage [4]. Gastroesophageal cancer has high rates of recurrence after primary treatment

and death occurs soon after, as it happened in our case that the patient died only 1 month after being presented with generalized peritoneal carcinomatosis.

Aorto-esophageal fistula rarely occurs as a result of aortic aneurysm, foreign bodies, infiltrating tumors, and radiotherapy, but it can be fatal, as it causes severe upper gastrointestinal bleeding. It has been reported to manifest as a complication of esophageal cancer associated with infiltrating tumor, radiotherapy, chemotherapy and esophageal stent placement [15,16]. In our patient, the local recurrence of the esophageal cancer and the esophageal metallic stent-associated trauma contributed to the development of the aorto-esophageal fistula. This type of fistula is typically presented with the Chiari triad, mid-thoracic chest pain and sentinel arterial hemorrhage followed by exsanguination. It can be diagnosed with CT angiogram, MRI or emergent upper endoscopy. Plethora of therapeutic methods have been proposed, such as extra-anatomic bypass, in situ repair and thoracic endovascular aortic repair [15,17]. In our case repair was feasible only by suturing the aorta as the deficit of the thoracic aorta was small.

Conclusion

Taking the increased incidence of gastroesophageal cancer into consideration, and also its causative relation with achalasia, the possibility of esophageal adenocarcinoma development should not be overlooked even in young patients, especially in those with a long history of untreated achalasia and a lot of predisposing factors. The poor prognosis of esophageal cancer has improved over the years with the addition of neoadjuvant chemotherapy or chemoradiotherapy, but local recurrence following surgery alone can cause a lot of complications such as stenosis or aorto-esophageal fistula, which can also be caused by the therapeutic management of stenosis with stent placement; therefore, general surgeons should be alert for the possibility of such life-threatening complications.

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