CASE REPORT - GENERAL AND SPECIALISTIC SURGERY

Minimally invasive esophagectomy for caustic ingestion after 73 years and over 200 endoscopic dilations: is it just a matter of time?

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Summary. Refractory esophageal strictures are a common sequela of caustic ingestion. If endoscopic dilation becomes ineffective, esophagectomy represents the only therapeutic option. The minimally invasive approach, specifically the thoracoscopic access in prone position, may allow postoperative morbidity to be reduced. We present the first case described in the Literature of minimally invasive esophagectomy in prone position for a long-term failure of endoscopic dilation after caustic ingestion. (www.actabiomedica.it)

Key words: minimally invasive esophagectomy, caustic ingestion, stricture, endoscopic dilation

Introduction

The ingestion of corrosive liquids shows a bimodal pattern (1): the first peek occurs in children aged 1 to 5 years, for the most part due to accidental ingestion, though toxic ingestion is a form of child abuse reported in the literature (1-3). The other peek age is seen among adults aged 21 years and older due to an intentional suicide attempt (1-3).

Caustic ingestion may cause injury to oral cavity, pharynx and the upper airway, injury and perforations of upper digestive tract and death (4). The most serious long-term complications occur to the esophagus: esophageal stricture and increased lifetime risk of esophageal carcinoma (5).

The first step in the management of benign esophageal strictures is endoscopic dilation (6, 7); the major complications of this approach are perforation (0,1-0,4%) (8), bleeding and bacteremia (9). The surgical approach is an option when endoscopic treatment fails or when a malignancy cannot be excluded.

Minimally invasive esophagectomy (MIE) performing thoracoscopic esophageal mobilization with the patient in prone position (MIEPP) is emerging as a suitable alternative to the open technique, allowing better postoperative recovery without compromising pathologic or oncologic outcomes (10-12).

We report the case of MIEPP for long-term refractory esophageal strictures due to caustic ingestion, to our knowledge described for the first time in the recent Literature.

Case Report

This is a case of chronic esophageal stricture in a 76 years old man, which had been going on since the age of 35 due to accidental caustic ingestion at the age of 3. Initially the patient was approached with gastrostomy kept in place until refeeding. After 32 years with no problems, he developed an esophageal stricture that was treated with over 200 endoscopic dilations. In the
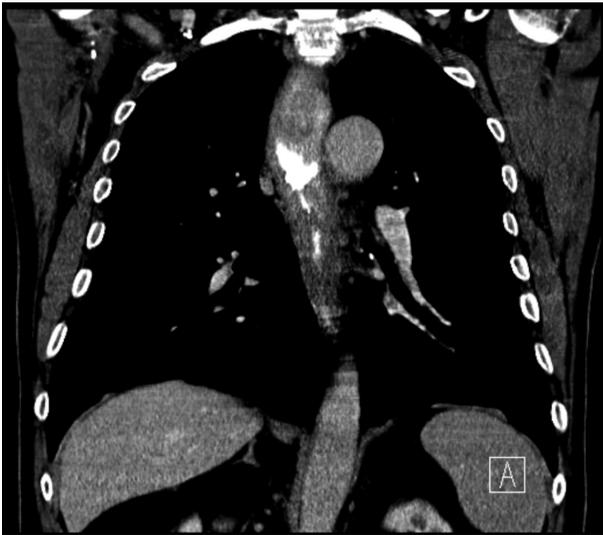
Figure 1. CT image of the stricture

last years, endoscopic dilations became ineffective and the patient developed severe dysphagia and weight loss, which amounted to indication for surgery.

The preoperative neoplastic markers were normal; a bronchoscopy was negative for stenosis/infiltration; pulmonary function tests were normal; an upper gastrointestinal series showed esophageal stenosis of the middle third with dilation in the upper portion; an esophagogastroscopy showed esophageal candida with stricture crossable by the instrument (biopsy: epithelial dysplasia); a thoraco-abdominal CT showed no clear cleavage between esophagus and right bronchus (Figure 1), and there was an esophageal uptake contrast in the total body PET.

In spite of the advanced age and according to the patient's expectations, we decides to perform a MIEPP rather than a safer feeding jejunostomy, taking into consideration also the chance of undiagnosed carcinoma.

Surgical procedure

The patient was placed in prone position after intubation with single-lumen endotracheal tube (in contrast to single-lung ventilation required in case of left lateral decubitus position). A right posterior thoracoscopic access was performed and only three trocars were placed, instead of the four trocars as required in

case of lateral decubitus position (13). A transitory pneumothorax at a pressure of 7-8 mmHg was performed allowing the ventilation of both lungs. Furthermore, the prone position of the patient allowed reduced lung injury because lung retraction was avoided. After the division of pulmonary ligament and the mediastinal pleura, the azygos vein was isolated and divided at the level of the arc; then the dissection of the esophagus with periesophageal tissue was performed from the diaphragmatic hiatus up to the pleural dome. Lymphadenectomy was performed *en bloc* with the esophagus and a chest tube drain was placed.

The patient was then placed in supine position for the abdominal part of the procedure, which was performed with a laparotomic approach. After Kocher's maneuver, the stomach was mobilized, preserving the right vessels. Through a left cervicotomy, the upper esophagus was isolated and divided. A gastric tube was introduced and fixed to the stump of the esophagus which was brought down to the abdomen. The esophagectomy was concluded with a polar gastric resection. A gastric tubulization was completed using a linear stapler. Afterward, thus the gastric tube was brought up to the neck using a tube as a guide. The cervical esophagogastric anastomosis was performed using a 25 mm circular stapler.

Postoperative course was complicated by a candida endocarditis; the patient was discharged on postoperative day 30. Histological examination showed a T2 N0 G1 squamous cell carcinoma (Figure 2). No adjuvant therapy was indicated and the patient was well at 1 year follow-up, with complete recovery of oral intake .

Figure 2. Esophagectomy specimen

Discussion

While in emergency, esophageal removal may represent a life-saving procedure in case of full thickness necrosis and perforation (14), the role of esophagectomy in the treatment of caustic ingestion sequelae is still under debate.

Endoscopic dilation remains the treatment of choice for esophageal strictures and dysphagia, in association with medical therapy (steroids) (9, 15). Unfortunately, strictures following caustic ingestion are usually difficult to treat and have a tendency to be refractory or to recur despite dilation therapy (9). Many additional endoscopic treatments, such as steroid injection (16), needle knife incision (17) or stent placement (18) have been proposed in order to manage refractory strictures, but long-term results are discouraging (9).

When facing an endoscopic dilation failure, many factors are to be taken into account to decide the proper surgical procedure. When age is advanced or general conditions are compromised, a feeding jejunostomy could represent a safe palliative alternative (19). Total esophagectomy is a high-risk surgical procedure, to be performed by experienced teams (20), but it is the only treatment able to restore effective oral intake and to prevent possible progression to carcinoma (21).

Traditional total esophagectomy usually requires three open surgical accesses (abdominal, thoracic and cervical), implying a heavy surgical burden for the patient with high postoperative mortality and morbidity (20). In recent years, minimally invasive approaches have been routinely adapted in many fields of abdominal surgery (22, 23) and have been performed with increasing frequency also for the treatment of esophageal cancer because they seem to produce better outcomes then those reported in most open series (24, 25). Specifically, in MIEPP, thoracoscopy is performed with the patient in prone position, entailing considerable advantages for the pulmonary function (no lung compression), a better operative field exposure, as well as improved surgeon ergonomics (10) (Figure 3). Moreover, reduced organ manipulation, typical of minimally invasive dissection, could reduce cancer cells seeding, which has been already advocated as a possible recurrence factor in colorectal tumors (26). The abdominal part of the procedure can be performed either lapa-

Figure 3. Operative field during thoracoscopy

roscopically or through a small laparotomy. The laparotomic approach doesn't seem to compromise postoperative recovery (10), even if it's associated with a higher risk of incisional ventral hernia (27). Just few reports of MIE for caustic ingestion have been published, mainly referring to emergency procedures and/or pediatric patients (28, 29).

Although never reported, we believe that long-term failure of endoscopic dilation can represent a proper indication for MIEPP, minimizing the impact of a high risk procedure for a benign condition. The peri-esophageal fibrosis, produced by the caustic ingestion and the multiple dilations, imposes careful isolation of the structures, which is however safe and feasible with a thoracoscopic approach.

Moreover, in our patient, in addition to a complete restoration of oral intake, MIEPP allowed radical treatment of a hidden esophageal carcinoma.

Conclusion

MIEPP represents a feasible and reasonable option for the treatment of refractory esophageal strictures due to caustic ingestion, after failure of endoscopic dilations.

Patient age, life expectancy, general conditions and the possibility of a progression to carcinoma are additional criteria to evaluate to set a proper indication to MIEEP.

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