Repair of Complete Longitudinal Esophageal Rupture With Preservation of Esophageal Motility

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There is no consensus on the ideal treatment for esophageal perforation and on the maximal extent of esophageal disruption amenable to primary repair. The effect of extensive esophageal injury on postoperative esophageal motility is also unknown. We report the case of a longitudinal iatrogenic esophageal laceration extending from the hypopharynx to the cardia in a morbidly obese patient treated with primary repair. The patient exhibited no postoperative esophageal leak or stricture and maintained a preserved esophageal peristalsis on manometry at 3 months. An extensively lacerated esophagus can be repaired primarily while maintaining a normal postoperative function.


Different types of esophageal perforation treatment have been proposed during the years, ranging from simple observation to esophagectomy and including endoscopic approaches such as clipping and stent placement [1]. Early diagnosis and prompt treatment have been associated with a better outcome [2, 3]. When surgery is indicated, primary repair is often preferred instead of resection, and its indications have become wider to include patients presenting later with more significant degrees of esophageal damage. However, the maximal extent of esophageal injury amenable to primary repair with adequate postoperative function has never been clearly documented. We report a case of complete longitudinal esophageal laceration repaired primarily.

Technique

Patient
A morbidly obese 30-year-old woman (body mass index, 47.4 kg/m²) underwent a bariatric experimental treatment involving the endoscopic insertion of a proximal gastric implantable device. During the initial 12 months, the patient went from a weight of 121.4 kg to 90.3 kg. After this initial success, the patient noticed an increase of appetite and started to regain weight. A partial failure of the device was noted during endoscopy, and the decision to remove the intragastric implant was made. The procedure was performed on this patient, who was in good preoperative condition and fasted overnight. The insertion of a 60F flexible over-tube was necessary, during which some degree of resistance was noted. It was possible to remove the device relatively easily, but the postremoval endoscopy revealed an extensive transmural esophageal laceration, with exposed mediastinal fat. Only a minimal degree of bleeding was documented, and the patient never presented any sign of hemodynamic instability.

Technique

After insertion of large-bore intravenous catheters and intubation with a double-lumen catheter, a right video-assisted thoracic surgery (VATS) was planned immediately to evaluate the extent of the laceration and the possibility of performing a primary repair. Also, if an esophagectomy had been needed, the dissection of the thoracic esophagus would have been possible through the VATS approach, allowing the prevention of a thoracotomy in a morbidly obese patient. The mediastinal pleura was opened, and the azygos vein was divided. The findings of the mediastinal exploration included a complete, well-delineated, longitudinal transection of the esophagus on its entire thoracic portion, without any significant pleural or mediastinal spillage, contamination, or bleeding. Although completely disrupted, the esophagus was not presenting any sign of necrosis or devitalization. Because of the healthy aspect of the esophagus at the transection margins and because the rupture was immediately recognized without being associated with any major mediastinal contamination, the decision to attempt a primary esophageal repair was made. A posterolateral thoracotomy in the fifth intercostal space was necessary to perform a two-layer repair of the thoracic esophagus with monofilament resorbable sutures. Two neuromuscular flaps taken from the fifth and sixth intercostal spaces were used to cover the esophageal repair. During the thoracic esophageal mobilization, it became evident that the disruption was extending to the cervical and abdominal portions of the esophagus, and a left cervical incision and laparotomy were undertaken to complete the esophageal closure. During thoracotomy, to...
facilitate the repair a 32F chest tube was inserted into the esophageal lumen up to the cervical esophagus, and the other end was brought into the stomach. A nasogastric tube was inserted into the chest tube lumen at the time of chest tube insertion (Fig 1). Later, at laparotomy, a small gastrotomy incision was created to remove the chest tube while maintaining the nasogastric catheter in good position. A feeding jejunostomy catheter was inserted. The cervical exploration documented a laceration extending up to the hypopharynx, and the primary repair could be completed at this level.

Postoperatively, the patient did well overall but experienced an intrathoracic abscess caused by Escherichia coli that was drained percutaneously under computed tomography guidance. A barium swallow performed on the 11th postoperative day revealed no evidence of esophageal leak (Fig 2). The patient was discharged home on postoperative day 21. Three months after the repair, the patient had no symptoms of dysphagia, pyrosis, odynophagia, or regurgitation. An esophageal manometry performed at that time revealed preserved esophageal peristalsis waves (Fig 3).

Comment

Perforation of the esophagus has been associated with significant mortality rates, and there is no global consensus on the most appropriate way to handle these patients. It is generally accepted that the treatment of this condition must be tailored to each patient according to the site of perforation, its cause, and clinical details such as delay between perforation and treatment, degree of mediastinitis, extent of esophageal injury, concurrent medical conditions, and hemodynamic stability [4]. If surgery is indicated, primary repair has been recommended even for patients presenting more than 24 hours after the injury [2]. Resection with or without immediate reconstruction has been suggested for patients presenting with perforations associated with a malignant or benign stricture and for patients presenting late with a significant degree of mediastinitis.

It has been proposed that esophagectomy should be undertaken in cases of extensive esophageal laceration [5]. More specifically, the length of esophageal laceration has been described as an indicator for the need of esophagectomy [6, 7]. This case, which is the most
extensive esophageal laceration primarily repaired reported to date, gives arguments against esophagectomy when then injury is recognized promptly, without associated significant mediastinitis or esophageal necrosis. This case is also an example that esophageal function can be maintained postoperatively even in cases of extensive injury.

In this case, the esophageal trauma was repaired over a 32F chest tube that was removed through a small gastrotomy incision. It has been suggested to perform the esophageal repair over a bougie [8]. The advantage of using a chest tube is that a nasogastric catheter could be inserted through its lumen and can remain in adequate position after its withdrawal, avoiding blind maneuvers in a freshly repaired esophagus.

In conclusion, it is possible to repair an extensive esophageal injury and maintain a normal postoperative esophageal function if the tissue quality is adequate and if no significant mediastinitis is present. Accordingly, the plan of treatment should be adapted to each clinical situation.

References