perforation and treatment. Even with early recognition and treatment, the mortality in esophageal perforation remains high, at over 20%, and it approaches 50% if the diagnosis is delayed longer than 24 hours because sepsis and multiorgan failure develop [5]. Surgical operation has traditionally been the treatment of choice, although it is now recognized that a nonoperative approach, with or without endoscopic placement of a stent, can be used successfully, depending on the degree of contamination [6]. Because of our patient’s long-standing treated acha-lasia, it was decided that a surgical approach would be more appropriate than stenting of a dysfunctional esophagus. Nonoperative management can be considered with small ruptures contained by the mediastinal pleura; however, this approach depends on a rapid, accurate initial assessment and a focused multidisciplinary management of any arising complications. Continuous reassessment is required with a low threshold for surgical intervention [6]. Surgical operation remains the mainstay of treatment for patients who present early with widespread pleural contamination. Some studies have shown that primary repair should be favored regardless of the interval period from presentation [7]. Lengthy delay in diagnosis increases the leak rate of a primary repair because of local sepsis and tissue edema [8]. Of equal importance to the type of repair are thorough lavage and debridement, and careful placement of mediastinal and pleural drains [6]. In the scenario of an extensive tear in an aperistaltic esophagus, and presentation within 24 hours of operation, the team here decided on resection and reconstruction rather than repair, and the outcome was successful.

References


Endovascular Repair in Penetrating Aortoesophageal Foreign Body Injury

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Foreign body ingestion in adults is not as common as in children. Sharp foreign body ingestion is even rarer; however, it may result in perforation, inflammation, or fistula formation at various gastrointestinal levels. In our case, the patient was unaware of the foreign body ingestion.

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and presented with retrosternal chest pain, odynophagia, and occasional choking. Endoscopy and computed tomography thorax scan revealed a piece of chicken bone penetrating the aorta through the esophageal wall. No signs of mediastinitis were found. The foreign body was retrieved endoscopically with simultaneous endovascular stent repair of the aorta. Postoperative recovery was uneventful. There is an associated high morbidity and mortality in such cases, mandating long-term follow-up.


Foreign body ingestion predominantly occurs at the extremes of age. Adults with gastrointestinal motility or structural disorders, mental retardation or psychiatric illnesses, alcoholics, and prisoners are at increased risk, whereas it occurs more commonly among children with tracheoesophageal fistula, stenotic lesions of the gut, or history of previous gastrointestinal surgery. Sharp metallic objects, dentures, fish bones, and poultry bones are notorious for esophageal perforation with or without penetration of adjacent viscerae. Pneumomediastinum, surgical soft tissue emphysema, mediastinitis, infection, paraesophageal or retroesophageal abscess, hemotherax, hemopericardium, cardiac tamponade, and massive upper gastrointestinal tract hemorrhage secondary to aortoesophageal or arterioesophageal fistula formation are some of the complications of foreign body ingestion.

A 63-year-old Chinese man was referred to us with 2 days of worsening retrosternal chest pain, odynophagia, and an occasional choking sensation. Although he had been experiencing these symptoms for approximately 50 days, he had ignored them. Clinical examination showed no change in voice, subcutaneous emphysema, or added sounds on chest and neck auscultation. Baseline investigations were within the normal range. Endoscopy (Fig 1A) and computed tomography scan (Fig 1B) showed a 2.7-cm long chicken bone penetrating the wall of the esophagus and into the aorta. The aortic defect was approximately 0.3 cm in diameter with a 0.8 cm bone inside the lumen. No active bleeding was noted. No paraesophageal collection or signs of mediastinitis were found.

We worked in liaison with a multidisciplinary team comprising gastroenterology, vascular, cardiovascular, and thoracic surgery. A joint plan was drafted for endoscopic bone removal by a gastroenterologist with simultaneous closure of the aortic defect using a minimally invasive interventional technique by the vascular surgeons, with cardiovascular and thoracic teams on standby, in case open surgery became necessary. Femoral access was achieved with meropenem prophylaxis to deliver a slightly oversized 32-mm non-bare expandable Hercules Terylene fabric stent (Microport Medical, Shanghai, China) in an aorta of 29 mm in diameter to seal the aortic wall defect. Intraoperative aortogram confirmed the position of the stent and confirmed no immediate postprocedure hemorrhage. The patient was converted to an oral antibiotics regimen the next day and continued for 1 week, during which he was kept under observation for signs of secondary or delayed hemorrhage or infection. Recovery was uneventful.

Comment
Foreign body ingestion is a common occurrence and becomes clinically significant only when impaction or complications occur. Areas of anatomic narrowing are frequent sites of impaction. Most commonly, the foreign bodies are food—particularly fish and chicken bones. Foreign bodies lodged in the gastrointestinal tract may have little or no effect. Only 2% of patients require surgical
intervention for their retrieval. Foreign body ingestion injuries account for 12% of total esophageal injuries [1]. The incidence of esophageal penetrating injuries due to foreign body is 1% to 4% [2] whereas perforation is 0.14% to 0.8%. Esophageal perforation is associated with an approximately 22% mortality rate.

Foreign bodies can become impacted, then dislodge and migrate. Initial impaction in the wall of esophagus leads to inflammation, abscess formation, ulceration, scarring, or erosion. The esophagus lacks serosa and is surrounded by loose areolar connective tissue, rendering it vulnerable to spread of inflammation and infection. Thus, erosion of the esophagus may lead to mediastinitis with aortic perforation, creating an aortoesophageal fistula.

Sharp objects cause devastating injuries and often result in esophageal perforation and penetration into adjacent structures. Migration of the foreign body to great vessels, heart, lung, liver, inferior pulmonary ligament, and subcutaneous tissue of neck and thyroid is well documented in the literature. It could endanger great vessels, especially the descending aorta, left subclavian, and carotid arteries owing to their close proximity. In rare instances, arterioesophageal fistula formation in an aberrant right subclavian has also been reported. Hemothorax, hemopericardium, cardiac tamponade, and other complications are also associated with esophageal injuries. Aortoesophageal fistula is a rare complication of foreign body ingestion. Fish bone has been reported in more than 100 cases as a cause of aortoesophageal fistula.

Clinical presentations of esophageal injuries include sense of discomfort, odynophagia, dysphagia, hematemesis, or melena. Perforation may present with chest pain, dyspnea, tachycardia, and tachypnea.

Esophagoscopy is a highly recommended investigation because of added therapeutic benefits, although contrast swallow and CT scan are warranted before any maneuvering. In cases of aortoesophageal fistula and aortic injuries, CT angiography depicts subtle details. Intraoperative conventional angiography is the gold standard so as to establish the integrity of the graft and rule out hemorrhage.

Management options depend upon the type of foreign body, site and size, extent of injury, and patient’s age and overall health status. The goals of treatment include prevention of further contamination from esophageal perforation, elimination of infection, restoration of esophageal continuity, and containment of associated complications. Esophageal perforation may require primary suturing or tissue reinforcements. In aortoesophageal fistula, interval surgery is suggested to repair the esophagus where part of it is replaced using gastric or jejunal pull through [3]. Surgical repair of the aortic defect has been undertaken with variable success rates; primary suturing remained mostly unsuccessful, and patients died of secondary hemorrhage. In 1987, an intercostal muscles flap was used to close the aortic defect; the patient died on the 29th postoperative day. In one case, the graft was reinforced with omental wrapping. Left thoracotomy was advocated in preference to right thoracotomy. Endovascular repair was not so popular because of lack of expertise and availability of appropriate caliber grafts. Until now, only a few cases of endovascular treatment for penetrating injury of the aorta have been reported in the English literature. However, it is the treatment of choice for blunt trauma [4]. Previously, endovascular repair was reserved either for cases with associated complications like pulmonary embolism or for patients unfit for open surgery, owing to the presence of other risk factors. Hybrid procedures were favored in cases where aortic repair required concomitant surgical toilet of mediastinal abscesses.

Endovascular grafting is relatively new treatment modality, first published in 1994 [5]. It is a simple, safe, minimally invasive, and effective intervention in restoring the integrity of the aorta. Our case was unique because there had been significant esophageal and aortic penetration injury due to migration and retention of a foreign body without any signs of inflammation or fistula formation. There was no active bleeding, hematemesis, or melena, and the patient’s hemoglobin was well within normal range. The age of the patient was another factor in favor of endovascular repair. Although enough data are not available on long-term outcomes of endovascular grafting, we still advocate the routine use of minimally invasive stent placement in patients with penetrating aortic injuries who do not exhibit cardiovascular compromise or widespread inflammation, to avoid the invasiveness of open surgical repair and long-term follow-up.

References

Temporary Clamping of Branch Pulmonary Artery for Pulmonary Hemorrhage After Endarterectomy
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A 49-year-old man underwent pulmonary thromboendarterectomy for chronic thromboembolic pulmonary hypertension. A massive pulmonary hemorrhage developed,