

Foreign Body in Mediastinum: Multidisciplinary Resolution of a Critical Case

Desiderio Adrián^{1,2*}, Covello Gustavo³, Chiminela Fernando⁴, Musolino Andrés⁵, Pascale Milagros⁵ and Yardín Emilio⁵

¹Chair of Surgery, Faculty of Medicine, University of Buenos Aires, Argentina

²Department of Surgical Specialties, Hospital General de Agudos Durand, Argentina

³Department of Cardiovascular Surgery, Hospital General de Agudos Durand, Argentina

⁴Department of Hemodynamics, Hospital General de Agudos Durand, Argentina

⁵Department of Surgery, General Hospital for Acute Durand, Argentina

Abstract

The intake of foreign bodies is a frequent and daily situation. Most of the time he has the spontaneous resolution, but when the foreign body turns out to be a sharp element, it usually causes esophageal drilling with the consequent risk of mediastinitis and/or bleeding. A critical case derived from different care centers is presented where multidisciplinary management and treatment achieve a favorable result.

Keywords: Mediastinum; Foreign Body

***Correspondence to:** Desiderio Adrián, Chair of Surgery, Faculty of Medicine, University of Buenos Aires, Argentina

Citation: Adrián D, Gustavo C, Fernando C, et al. (2023) Foreign Body in Mediastinum: Multidisciplinary Resolution of a Critical Case. Prensa Med Argent, Volume 109:1. 389. DOI: <https://doi.org/10.47275/0032-745X-389>

Received: January 23, 2022; **Accepted:** February 17, 2023; **Published:** February 22, 2023

Introduction

The intake of foreign bodies can occur accidentally, but most records occur in patients with psychiatric pathology or prison community that ingest them intentionally to be treated within the hospital. The strange bodies ingested can fish thorns, pieces of crystals, metal fragments, needles, or pins, among others. Most of the time he has a spontaneous resolution, however, the presence of a stuffed foreign body can injure and/or pierce the esophagus, a situation that can trigger acute mediastinitis or affect an important glass and trigger a hemorrhage [1-5]. In some cases, it is necessary for an endoscopic invasive procedure, and in others, the situation culminates in more risky surgical interventions or even the death of the patient.

Our goal is to present a case that was resolved in a multidisciplinary form at the Carlos G Durand Hospital in the CABA.

Clinical Case

A 44-year-old patient, without a pathological history of relevance, smoking, with loss of dental pieces. Rural worker. He refers to initiate suddenly, after food intake (bread) with retroeternal pain, of intensity 7/10, exacerbated with the intake of solids and partial improvement with NSAIDs, by adopting the left lateral recumbency. The patient performs immediate consultation in a health center, where he enters with suspicion of the acute coronary syndrome. ECG is performed without changes and negative biomarkers, so after 24 hours it is external. It continues with pain, so 48 hours after the picture started, consult another health center. A new ECG is performed without changes and

negative biomarkers. Thorax tomography is performed, which rules out acute aortic pathology and is again externalized. At 96 hours later, consultation is done again in the health center for pain persistence, which is progressive. Review of all diagnostic procedures carried out so far, evidencing a linear image of 2 cm long, fine, which extends from the esophagus to relying on the vertebral level, of greater density to the bone and spiral looking that is interpreted as a foreign body impacted at the esophageal level with esophageal drilling (Figure 1). With this diagnosis, the patient is referred to a hospital with greater complexity. A high video endoscopy is performed, which does not evidence of a strange body or esophageal perforation, and a gastric esophagus serial that does not show loss of contrast or esophageal lesion (Figure 2). Subsequently, Angio TC is requested with 3D reconstruction where it is displayed in relation to the aortic wall, in its descending portion, an

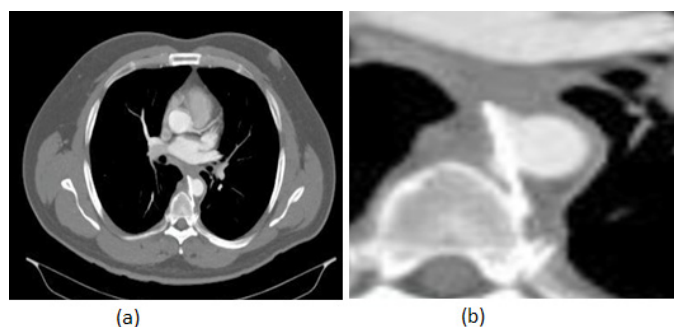


Figure 1: (a) Thorax TC that evidences the aortic contrast leakage and (b) the impact of the foreign body on the dorsal vertebra.

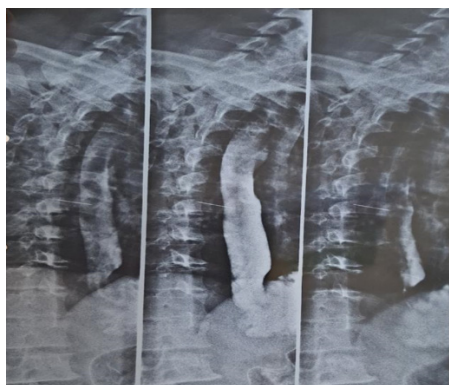


Figure 2: Gastric esophagus: there is no evidence of loss of contrast or esophageal lesion.



Figure 3: Angio TC with 3D reconstruction: Relationship between dorsal column, thoracic aorta, and foreign body.

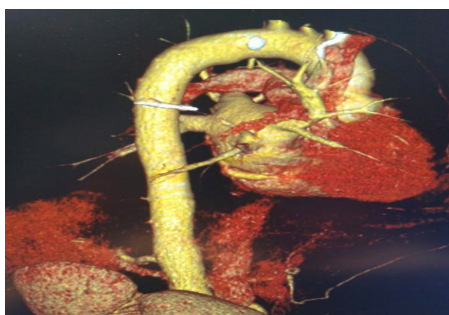


Figure 4: Angio TC with 3D reconstruction: Relationship between thoracic aorta, heart, and large vessels with the foreign body.

image of high density linked to a foreign body. The same also presents a relationship with the posterior wall of the esophagus. At the moment there are no signs of inflammation or adjacent infection. Endovenous contrast leakage is displayed in relation to aortic laceration (Figure 3 and Figure 4).

The picture is interpreted as a foreign body ingested with subsequent migration and esophageal wall drilling, staying over the dorsal vertebra that drills and/or penetrates the wall of the descending aorta, with a generation of 2 (two) aortic perforations. It cannot be specified if the strange object is inserted in the wall of the aorta out of true light; or if you are in contact with the true light with the drilling of the wall and at the same time the hole caused.

Meanwhile, the patient is stable without signs of infection or leukocytosis, in good general condition, and without evidence of bleeding or hematocrit decrease. Hemocultures are made and empirical treatment is initiated with amikacin, ceftriaxone, and metronidazole

before the suspicion of endovascular infection - mediastinitis at a digestive entrance door.

Diagnostic and Therapeutic Approach at the Durand Hospital

Multidisciplinary and Interhospital Athenaeum are performed in order to determine the best therapeutic behavior. It is decided, prioritizing patient safety, two steps treatment. The first, treat aortic lesions with a thoracic endoprosthesis. And the second is the extraction of the foreign body with Videocolposcopia with eventual open sky resolution. It remains admitted to cardiovascular recovery. Pre-surgical is completed, and image studies are updated.

First step

In the hemodynamics room, aortic MICORT Hercules 26 - 24 - 160 mm from the right femoral access is placed and implemented after the emergence of the left subclavian artery, without reaching the level of the diaphragm, thus covering the area where located the foreign body (Figure 5). The procedure was performed without complications, returning the patient to the intensive care unit, and cardiovascular recovery room [6].

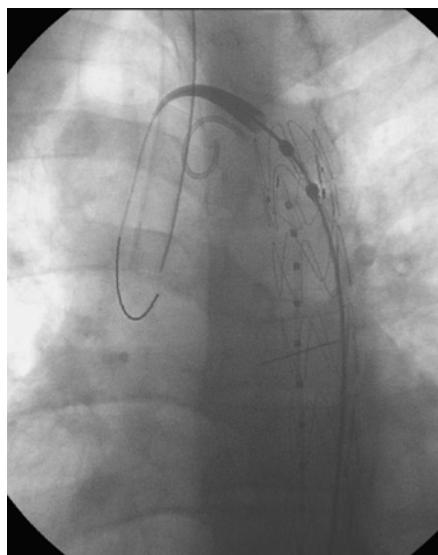


Figure 5: Image that illustrates the implant of the aortic endoprosthesis. Note the detail of the arrow, which points to the foreign body.

A new image is performed for evolutionary control of the esophageal lesion where thoracic endoprosthesis is evident, without pathological signs (Figure 6), the patient is hemodynamically stable, with good ventilatory mechanics and laboratory results without alterations [7].

Second step

A week later the foreign body is extracted, post-implant of the aortic endoprosthesis, in the operating room under general anesthesia and with right lung selective ventilation. With the Stand-by extracorporeal pump, the strange object is tried to be removed by video thoracoscopy, being impossible due to the existence of the aortic retro fibrous process that prevents its visualization. Open-pit conversion is decided, performing left lateral thoracotomy in the fifth intercostal space until reaching the foreign body. A video camera is placed for visual amplification and a 4.5 cm long sewing needle is extracted (Figure 7). The thorax is oot with two pleural drains. The patient returns to the recovery room. Finally, the patient is exterminated 7 days after the last intervention, returning to his daily life [8,9].



Figure 6: Angio TC for evolutionary control of esophageal lesion, relation to the foreign body and thoracic endoprosthesis.

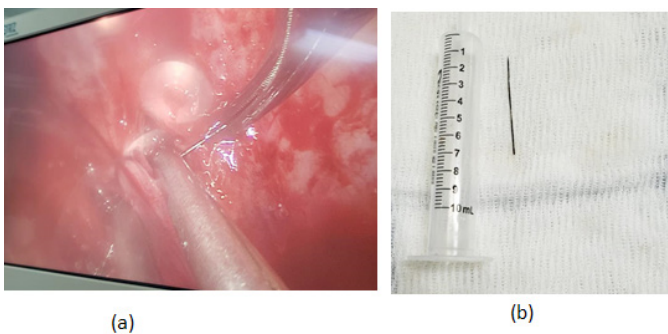


Figure 7: (a) After surgical dissection, the needle is taken with a Bertola clamp, and (b) A Centimeter syringe is next to the sewing needle.

Discussion

The intake of foreign bodies is a frequent and daily situation. Most of the time he has spontaneous resolution and elimination by the digestive tract, although in some cases an invasive procedure is necessary, and the situation culminates in risky interventions or even the death of the patient [10]. If the foreign body generates vascular commitment of large vessels, it puts the patient at risk of life, either because of the vascular lesion itself due to direct drilling, or by the bacterial contamination that occurs after transferring the wall of the digestive tract to the structures to the structure's neighbors, generating acute mediastinitis.

The symptoms associated with the intake of a foreign body are laryngeal discomfort (88%), odynophagia (30%), and hemoptysis (6.9%), with fish thorns being the most frequently found foreign body (84% of cases), followed by chicken and pork bones (5%). Foreign bodies most frequently involved in esophageal perforation and migration are fish thorns is not a minor fact, since the radiological characteristics of thorns make visualization very difficult through TC or other images, determining that their diagnosis is even post-mortem in pathological anatomy of unresolved mediastinitis. Perhaps the physical characteristics of the needle ingested by our patient

determined a relatively rapid diagnosis that avoided reaching extreme and unfortunate endings.

Although there are no randomized works or precise algorithms of diagnosis and treatment, there would be the formation of aortic pseudoaneurysms with subsequent fistulization to the esophagus and conformation of aorta-esophageal fistulas. Ingestion of foreign bodies happens more frequently in children or in older adults, being predisposing factors, for this reason, the use of dental prostheses, alcoholism, and mental or psychiatric disorders. According to a publication from the University of Barcelona, Spain, 80 - 90% of the ingested bodies migrate through the gastrointestinal tract and are expelled, 10 - 20% require endoscopic extraction, and less than 1% a surgical procedure [11]. It is necessary to highlight the differences that occur according to the geographical, cultural, or social characteristics according to where this situation occurs: in China, 80 - 90% of the foreign bodies are extracted by endoscopic methods, while in the USA that percentage does not exceed 20%. The explanation for this difference lies in the habit of fish intake, more frequent in eastern countries, which causes a large part of the foreign bodies ingested to be thorns of them; Thorns that due to their pointed characteristics are not expelled and nestled in viscera, with greater risk of complications and from there, the need to extract them. Currently, we should also consider the implant of rings or piercing in certain areas of the body as risk elements for esophageal drilling, depending on the social customs or age group prevailing in the society where the event occurs. Notorious is also the migration capacity of these objects: an observation made in a Tertiary hospital in Brazil collected information on 3000 foreign bodies ingested over 30 years. Of these, 2 drilled esophagus and migrated until they were housed in the aorta and cervical region, and another 2, the drilling site was the pharynx, being housed in the cervical region corresponding to zone II, maxillary height. It is clearly understood that those pointed objects, with edge or relative under profile are those that have the most risk of drilling and/or migrating, even if it is a situation of low prevalence. It is observed an unusual case of the intake of fish thorn with esophageal drilling and migration to the thoracic aorta in a patient who refused extraction and who after 6 years of follow-up, continued asymptomatic and without complications for the object. Considering cardiovascular pathology and its affection for the intake of foreign bodies, a Chinese publication collected 651 cases of intake of foreign bodies that occurred between 2013 and 2019. Of them, 12 presented cardiovascular commitment due to injury in all cases of the thoracic aorta. Of these, 1 case was treated with open surgery and the remaining 11 were treated with implantation of Thoracic endovascular aortic repair (TEVAR) and subsequent surgical/endoscopic removal of the foreign body. The 30-day survival was 100% of cases. There is a global tendency to endovascular treatment of aortic lesions as the first measure, and combined with this, surgical treatment for the eventual foreign body extraction or drainage of the infectious complication that could be generated. Endovascular treatment also avoids large surgical dissections and reduces the risk of paraplegia and infections associated with the procedure. In a few cases when the pathology is advanced or there are associated pathologies such as large collections, bronchial commitment, or the need to defunctionalize the digestive tract, it only remains to perform open-pit surgical treatment with eventual aortic-aortic protésic interposition or biological graft.

Conclusion

Faced with the suspicion of foreign body intake injury, it is important for the evolution and survival of the patient not to minimize the overlapping clinical picture that occurs at the beginning. Take



into account the age group, the food customs, the work activity of the individual, the pathological history, and their addictions. Since this pathology, it evolves in seemingly slow stages, which must be diagnosed and treated in time, because the outcome can be sudden and unfavorable when large vessels are lacerated.

It is a priority to make a precise topographic diagnosis of the lesion, if possible, to identify what type of foreign body the patient (its physical and radiographic characteristics) presents that the therapeutic decisions are really multidisciplinary, coordinated, and consecutive with each other.

The endovascular treatment of the great vessels puts a waiting compass in the evolution of this pathology, safeguards the patient's life as the first measure, and allows to make interdisciplinary decisions since, once the endoprosthesis is placed, the extraction of the foreign body subtractions according to local infection, systemic repercussion, and the corresponding surgical repair.

References

1. Vieitez JHS, Clemente IJ, Compta XG () Cuerpos Extraños en el Esófago. In *Laringe Y Patología Cérvico-Facial*.
2. Mamede RCM, Amaral FD, Raimundo DG, Freitas LCCD, Ricz H, et al. (2009) Corpos estranhos caminham pelo corpo em direção ao coração? *Braz J Otorhinolaryngol* 75: 195-199. [https://doi.org/10.1016/s1808-8694\(15\)30778-3](https://doi.org/10.1016/s1808-8694(15)30778-3)
3. Ruan WS, Lu YQ (2020) The life-saving emergency thoracic endovascular aorta repair management on suspected aorto-esophageal foreign body injury. *W J Emerg Med* 11: 152-156. <https://doi.org/10.5847/wjem.j.1920-8642.2020.03.004>
4. Ahmed MN, Nabir S, Ahmed Z, Al Hilli SAA, Ravikumar V, et al. (2017) Aortic pseudoaneurysm caused by ingested foreign body. *Appl Radiol* 46: 32-34.
5. Lai ATY, Chow TL, Lee DTY, Kwok SPY (2003) Risk factors predicting the development of complications after foreign body ingestion. *Br J Surg* 90: 1531-1535. <https://doi.org/10.1002/bj.s.4356>
6. Zeng L, Shu W, Ma H, Hu J (2020) Aortic injury caused by esophageal foreign body-case reports of 3 patients and literature review. *Medicine* 99: e20849. <https://doi.org/10.1097/MD.00000000000020849>
7. Ko SF, Lu HI, Ng SH, Kung CT (2013) Fishbone penetration of the thoracic esophagus with prolonged asymptomatic impaction within the aorta. *J Vasc Surg* 57: 518-520. <https://doi.org/10.1016/j.jvs.2012.08.067>
8. Rawala MS, Badami V, Rizvi SB, Nanjundappa A (2018) Aorto-esophageal fistula: a fatal complication of thoracic endovascular aortic stent-graft placement. *Am J Case Rep* 19: 1258. <https://doi.org/10.12659/AJCR.911441>
9. Ghosh SK, Rahman FZ, Bown S, Harris P, Fong K, et al. (2011) Survival following treatment of aorto-esophageal fistula with dual esophageal and aortic intervention. *Case Rep Gastroenterol* 5: 40-44. <https://doi.org/10.1159/000323700>
10. Hanif MZ, Li D, Jabeen S, Fan Q (2013). Endovascular repair in penetrating aorto-esophageal foreign body injury. *Ann Thorac Surg* 96: 1457-1459. <https://doi.org/10.1016/j.athoracsur.2012.12.046>
11. Canaud L, Ozdemir BA, Bee WW, Bahia S, Holt P, et al. (2014) Thoracic endovascular aortic repair in management of aorto-esophageal fistulas. *J Vasc Surg* 59: 248-254. <https://doi.org/10.1016/j.jvs.2013.07.117>