Case Report

Esophageal foreign body perforation presenting as chronic thoracic pain

Katarina Ureña-Castro¹, Raquel Herrera-Rodríguez², Alfredo Mora-Guevara² and Gabriela Jiménez Arguedas²*

¹Department of Pediatrics, Hospital William Allen, Costa Rica
²Department of Gastroenterology and Clinical Nutrition, Hospital Nacional de Niños, Costa Rica

Abstract

Foreign body ingestion occurs frequently in children and may lead to severe complications and mortality. In this article, we present the case of a two year old who ingested a foreign body (FB) that lodged and developed a mass in the esophagus. She presented with chest pain. Imaging did not reveal the foreign body. She underwent surgery for resection of the mass and anastomosis. Pathology reported 2cm long, round, plastic and inert FB with important inflammatory reaction.

Introduction

Children of all ages may ingest a Foreign Body (FB), however the highest incidence is between the ages of 6 months and 3 years. Gastrointestinal tract obstruction or impaction by a FB depends on the physical properties of the object, including its size, shape and composition.

An esophageal diverticulum is a relatively rare disorder of the esophagus. It is an outpouching of the esophageal mucosa and is usually asymptomatic. Patients typically present when they have symptoms of regurgitation or dysphagia [1].

There are different ways to categorize esophageal diverticulum. Esophageal diverticula can be divided into true and false diverticula. True diverticula are outpouchings that include all layers of the esophageal wall while false diverticula only include the mucosa or submucosa [1].

We report the case of a 2 year 7 month old girl, who presented with history of progressive intermittent thoracic pain. After multiple tests were done, she was finally taken to the operating room, where a pseudo-diverticular mass, in the middle esophagus was resected and a FB was revealed.

Case summary

A 2 year 7 month old girl, presented to our hospital with a 6-month history of thoracic pain. She had no previous diseases nor treatments. Her pain was retrosternal, intermittent and progressive. She had no history of syncope, dyspnea, cough, salorrhea, emesis, dysphagia, fever or abdominal pain.

By the time she got to our consult, she had received a 2 weeks course of proton pump inhibitors (PPI) with good response, but after she finished treatment the symptoms returned. The chest X-ray was normal. She also had a normal echocardiogram and electrocardiogram. A contrast swallow study and upper gastrointestinal series showed a dilatation of the upper esophagus and an irregular and pseudo-diverticular aspect mass in the middle esophagus with grade II gastroesophageal reflux, the rest of the transit was reported normal (Figure 1). The upper endoscopy documented a solid mass obstructing and deviating the lumen with friable mucosa in the middle esophagus and a hiatal hernia. (Figure 2) Concomitant bronchoscopy using methylene blue was performed to rule out trachea-esophageal fistula, with no abnormal findings. The esophageal biopsy documented mild chronic esophagitis. The abdominal ultrasound was normal.

The chest CT scan with contrast reported: pseudo-diverticular image of the anterior middle third of the esophagus, with important inflammatory changes in this portion and immediately caudal, suggesting esophageal perforation as the...
first possibility, without being able to rule out other entities. (Figure 3).

With these new findings the parents were asked again about the possibility of foreign body ingestion and they remembered that a few months ago, she had an episode of cough while eating a fish soup. She was taken to the operation room with the preoperative diagnosis of pseudo-diverticular mass. A thoracotomy was performed and a 2x2 cm mass was resected with an end to end esophagus anastomosis.

The macroscopic examination of the resected lesion described a cylindric piece of esophagus with an outer layer of friable tissue and a perforation of 5 mm. The sample had a lumen and a saccular cavity with a diameter of 1 cm where a 2 cm plastic, round and inert FB was found (Figure 4). Histology documented esophageal epithelium that showed intercellular edema, presence of intraepithelial lymphocytes and few eosinophils (<5/HPF). Focally there are reactive changes in the basal layer. Suggesting an inflammatory reaction. No tumor lesion was observed.

Two days after discharge, the girl presented chest pain and fever, they consulted the emergency department and a mediastinitis with right plural effusion was documented through radiological studies. She was taken to the operating room for a right lateral thoracotomy, pleural lavage and right lung decortication. She completed 14 days of antibiotic therapy. Patient’s clinical course was unremarkable so she was discharged and remained asymptomatic. The patient had three upper endoscopic studies after surgery, all within normal limits.

Discussion

In 1962, the first case of foreign body (FB) ingestion was reported, when 4 years old prince, “Frederick the Great” swallowed his shoe buckle [2]. Like our patient, FB ingestion tends to occur more commonly in toddlers (1-4 years) [3,4]. This is because of their explorative behavior, immature swallowing control and the absence of molars and premolars [2]. The most commonly ingested/aspirated FBs are coins and batteries [5,6].

Most of foreign bodies ingested pass through spontaneously (80%), however, sometimes they become lodged in physiological narrow sites. The esophagus is one of the most common sites where they localize. Our patient had it at the tracheal bifurcation (T6 level), one of the described locations [7-9]. The main complaint and the physical exam vary with the children’s age, the type of object ingested, the anatomical site, and the time passed after the ingestion [10]. Patients like ours with non-witnessed ingestion represent a diagnostic challenge. A delayed diagnosis in these patients tends to increment the risk of complications [8]. The retention of a foreign body in the esophagus can produce mucosal ulceration, inflammation as well as some potentially fatal complications such as paraesophageal or retropharyngeal abscess, mediastinitis, empyema or esophageal perforations [11].

According to some authors patient’s aged 2 years or younger, with a history of fever, cough or wheezing, and with physical examination findings of wheeze, stridor, rhonchi or fever, are associated with an unwitnessed ingestion of FB compared to those who were witnessed [10,12]. Our patient didn’t have history of fever or persistent cough and she had a normal physical exam.

The main symptom in our case was thoracic pain. Esophageal disorders are the most common causes of non-cardiac chest pain. Both the heart and the esophagus share some afferent neuronal pathways, so the pain perception from these organs can be similar. As a visceral pain, it tends to be diffuse and vague [13]. Also, the afferent somatic pathways coming from the thoracic wall join the visceral afferent pathways coming from the esophagus and the heart; this explains why a disorder in the esophagus can present as thoracic pain [14].
The prevalence of intestinal perforation after foreign body ingestion varies according to the characteristics of the ingested body, the anatomical localization and the time that has passed after the ingestion. Specifically the esophageal perforation prevalence varies according to different series, from 1–2% of cases [10,11]. Some groups have proposed systems to classify the resulting esophageal damage after foreign body ingestion. For example, Wei and colleagues developed a scale using multidetector computed tomography: Grade I, with non-penetrating esophageal injury (damage to mucosa and sub-mucosa only) and minimal hemorrhage or local infection. Grade II and III have an esophageal perforation and mild to severe mediastinitis, respectively, and Grade IV, when there is an aorta–esophageal fistula. This score has the purpose of preventing complications during the endoscopic examination of patients with a foreign body at the aortic level, because it may lead to iatrogenic injury. 15 Fortunately, for our patient, even though she had a perforation just below the tracheal bifurcation, it was localized at the anterior wall, and at this anatomic site, the Aorta is running posterior to the esophagus.

According to the reviewed literature, most case reports of retained esophageal foreign bodies presenting as a mass, have a chronic evolution in common [8,16,18]. The FB triggers the production of granulomatous tissue around the perforation or lesion, and complicates the diagnosis. Almost all of these cases end up needing surgery, although there are increasing reports of endoscopic approaches [7,19,20].

**Conclusions**

Given the high incidence of foreign body ingestions, and considering that 75% of cases are reported in children 5 years old or younger [3], this is a possibility that always needs to be considered in the differential diagnosis of a child presenting with the typical or even atypical symptoms. A delayed diagnosis is associated with greater complications and morbidity.

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