CASE REPORT

Aortoesophageal fistula from an ingested large hand needle in a nonverbal adult with autism

Jongbae Son, Dae Hyun Kim, Sang-Ho Cho

Department of Thoracic and Cardiovascular Surgery, Kyung Hee University Hospital at Gangdong, Kyung Hee University College of Medicine, Seoul-*Republic of Korea*

ABSTRACT

Aortoesophageal fistula (AEF) is a rare and life-threatening condition that can result from foreign body ingestion, particularly in vulnerable populations with impaired communication, where diagnosis may be delayed. A 26-year-old male with severe autism and limited expressive ability presented to the emergency department with a two-day history of fever and melena. Two hours prior to arrival, hematemesis occurred during an attempt at oral intake. Caregivers reported behavioral changes and a deterioration in his general condition over the preceding 10 days. Diagnostic imaging revealed a large, curved metallic foreign body that had perforated the esophageal wall, traversed the prevertebral space, and appeared to penetrate the thoracic aorta with its tip, leading to mediastinitis and AEF. Despite emergency surgery with cardiopulmonary bypass, the patient succumbed to sepsis and multi-organ failure within 24 hours postoperatively. This case highlights the importance of clinicians considering the possibility of an asymptomatic period following sharp metallic foreign body ingestion, which can lead to severe complications, particularly in patients with communication impairments. The asymptomatic interval can result in significant complications, including luminal erosion, rupture, or the development of a fistula with adjacent structures. Emergency physicians must suspect AEF, especially in patients with a history of foreign body ingestion, when gastrointestinal bleeding is accompanied by signs of severe infection. Timely use of computed tomography (CT) imaging is critical for confirming the diagnosis and determining the need for emergency surgical intervention. This case underscores the necessity of thorough evaluation in managing potentially life-threatening foreign body ingestion.

Keywords: Foreign body ingestion; aortoesophageal fistula; mediastinitis; autism.

INTRODUCTION

Aortoesophageal fistula (AEF) is a rare but life-threatening condition that typically results from esophageal perforation, often due to foreign body ingestion. Early recognition of foreign body ingestion is crucial to prevent progression to AEF and severe complications such as mediastinitis, sepsis, and multi-organ failure.[1,2] In patients suffering from dysphagia, chest pain, a history of problematic ingestion, and vomiting of a small amount of blood, AEF should be considered.[2] However, the clinical presentation of AEF can be subtle, especially in patients with communication impairments, where diagnosis may be delayed and the clinical course can deteriorate rapidly. This case report describes an adult patient with severe autism who ingested a sharp foreign body, leading to a delayed diagnosis of AEF and subsequent fatal sepsis despite emergency surgical intervention.

CASE REPORT

A 26-year-old male with severe autism and limited expressive capacity presented to the emergency department with a two-day history of fever and melena. Two hours prior to arrival, hematemesis occurred while attempting oral intake. Given his profound communication limitations, he was un-

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Address for correspondence: Sang-Ho Cho

Department of Thoracic and Cardiovascular Surgery, Kyung Hee University Hospital at Gangdong, Kyung Hee University College of Medicine, Seoul, Republic of Korea

E-mail: sinan75@naver.com

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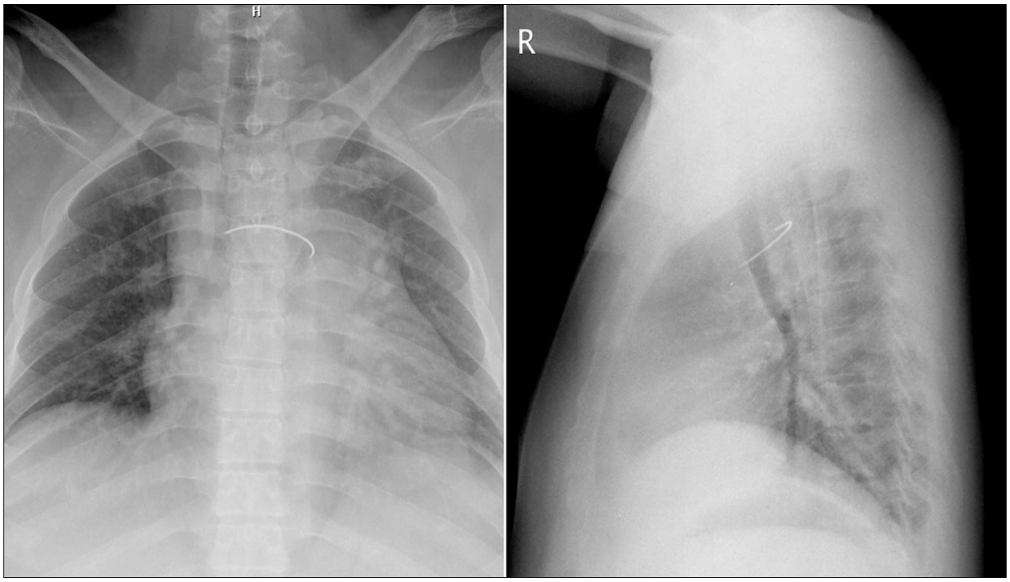

Figure 1. Chest radiograph showing a large semicircular metallic foreign body projected over the mid-thoracic region.

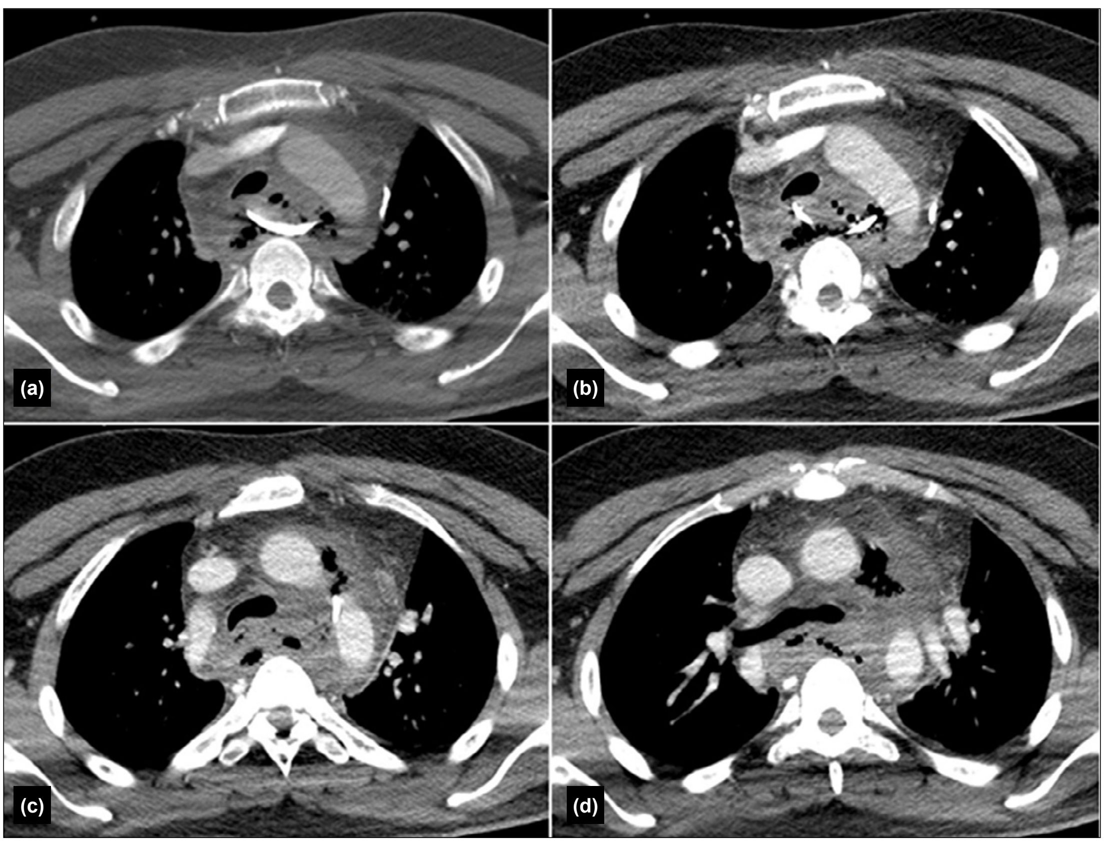

Figure 2. Contrast-enhanced chest computed tomography (CT) showing a large semicircular metallic foreign body perforating the esophageal wall and penetrating the posterior wall of the thoracic aorta, with surrounding mediastinal fluid accumulation and gas formation consistent with abscess formation.

able to clearly express pain or other symptoms in the days before presentation, but caregivers noted behavioral changes and deterioration in his general condition over the preceding 10 days. On presentation, his body temperature was 39.3°C, blood pressure was 100/60 mmHg, and heart rate was 110 beats per minute. His hemoglobin was 7.8 g/dL (previously 14 g/dL one year earlier), C-reactive protein was 22.08 mg/dL, and erythrocyte sedimentation rate was 52 mm/h. The white

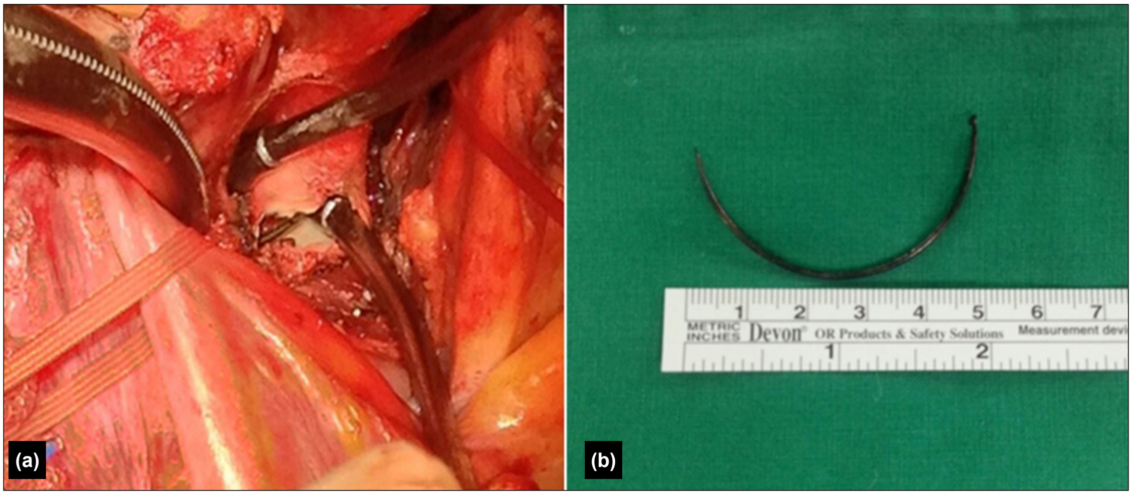

Figure 3. (a) Intraoperative image showing the tip of a large semicircular hand needle penetrating through the wall of the thoracic aorta. **(b)** The extracted semicircular hand needle measures approximately 5 cm in diameter.

blood cell count was 10,500/µL, with 88.4% neutrophils and 4.7% lymphocytes. A chest X-ray demonstrated a large semicircular metallic foreign body at the level of the carina (Fig. 1), and an axial contrast-enhanced computed tomography (CT) scan revealed gas collections and fluid accumulation within the prevertebral space, consistent with mediastinal infection or abscess formation. The inflammatory process extended superiorly to involve the aortopulmonary window and the region surrounding the aortic arch. The large, curved metallic foreign body had perforated the esophageal wall, traversed the prevertebral space, and appeared to penetrate the thoracic aorta with its tip (Fig. 2). The patient underwent emergency surgery under cardiopulmonary bypass and circulatory arrest. During surgical preparation following anesthesia induction, massive hematemesis occurred, prompting immediate establishment of cardiopulmonary bypass to maintain circulation. However, severe hemodynamic instability prior to resuscitation likely contributed to early multi-organ dysfunction. A large semicircular hand needle, approximately 5 cm in diameter, was found penetrating the thoracic aorta (Fig. 3). The foreign body was removed, and both the aortic and esophageal defects were repaired. Postoperatively, the patient remained hypotensive due to profound vasoplegia and ultimately died on postoperative day 1 as a result of progressive sepsis. Written informed consent was obtained from the patient's parent, who was the legal representative of the deceased patient.

DISCUSSION

Aortoesophageal fistula is an abnormal communication between the esophagus and the aorta. It is a rare and life-threatening condition, most commonly caused by thoracic aortic aneurysm. Other etiologies include esophageal malignancy, ingestion of foreign bodies, postoperative complications, and infection. The clinical course of AEF typically deteriorates abruptly into a life-threatening state at the onset of massive hematemesis, which is often characterized by bright red arterial bleeding.[1] Foreign body ingestion is the second most common cause of AEF. Most impacted foreign bodies are identified within 24 hours of ingestion, and with prompt recognition, nearly all can be successfully removed endoscopically without the need for surgical intervention.[2,3] However, when sharp or pointed metallic objects, fish bones, or clips are ingested—or when diagnosis is delayed—impaction or perforation can occur at sites of acute angulation or physiologic narrowing, most commonly within the esophagus, potentially progressing to AEF.[1,2] Once the diagnosis of AEF resulting from a foreign body is established, prompt surgical intervention is crucial to control hemorrhage and address both the foreign body and the fistula. Aortic repair is particularly challenging due to contamination of the surgical field by fistulous contents and the extensive inflammatory response surrounding the defect. Consequently, the mortality rate associated with the management of AEF remains significantly high.[2,4]

Accidental ingestion of foreign bodies occurs more frequently in vulnerable populations such as young children, the elderly with dental issues, and individuals with intellectual disabilities or psychiatric disorders.[1,5,6] In patients with impaired communication, diagnosis may be significantly delayed (especially when ingestion does not provoke acute discomfort) resulting in progression to AEF. The clinical progression of AEF is classically described by the Chiari triad, which includes mid-thoracic pain, a sentinel hemorrhage (a minor initial bleeding episode), and subsequent fatal exsanguination.[7] A notable feature of the Chiari triad is the presence of an asymptomatic interval between the initial pain or sentinel hemorrhage and the final catastrophic bleeding event, which can range from several hours to days or even weeks. In cases of AEF caused by foreign body ingestion, this asymptomatic window plays a particularly critical role in influencing clinical outcomes.[1] When accompanied by severe necrotizing mediastinitis due to delayed diagnosis, the clinical course becomes even more devastating. Surgical management is often challenging due to extensive infection and tissue destruction, and outcomes are poor despite aggressive intervention.[8]

CONCLUSION

Why Should an Emergency Physician Be Aware of This?

We report an extremely rare case of AEF and mediastinitis resulting from delayed recognition of an ingested large semi-circular hand needle in a nonverbal adult with autism. This case highlights the importance of clinicians recognizing the potential for an asymptomatic period following sharp metallic foreign body ingestion, which can lead to severe complications, including the formation of a fistula with adjacent structures, particularly in nonverbal adults with intellectual disabilities or pediatric patients with communication impairments. Although this condition is extremely rare, it may be easily overlooked as a typical foreign body case, as a radiopaque metallic foreign body is readily identifiable on the routine initial chest X-ray commonly performed in the emergency department. Moreover, in this patient, where melena was the primary complaint upon presentation to the Emergency Room (ER), it could have been misinterpreted as a simple esophageal injury rather than a more serious condition such as AEF. In such situations, there is a risk of prematurely performing endoscopic removal, which may not be appropriate and could potentially induce life-threatening bleeding. The prolonged asymptomatic interval following foreign body ingestion may lead to progressive complications such as luminal erosion, rupture, or even the development of AEF. Emergency physicians must maintain a high index of suspicion for AEF, especially in patients with foreign body ingestion who present with gastrointestinal bleeding accompanied by signs of severe infection. Timely use of CT imaging is critical for confirming the diagnosis and determining the need for emergency surgical intervention. This case underscores the necessity of thorough evaluation in managing potentially life-threatening foreign body ingestion.

Peer-review: Written informed consent was obtained from the patient's parent, who was the legal representative of the deceased patient.

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OLGU SUNUMU - *ÖZ*

Otizmli, konuşamayan bir yetişkinde yutulan büyük el iğnesinden kaynaklanan aortoesofageal fistül

Aortoesofageal fistül (AEF), yabancı cisim yutulması sonucu ortaya çıkabilen, özellikle iletişim bozukluğu olan savunmasız popülasyonlarda tanı gecikmesine neden olabilen, nadir görülen ve yaşamı tehdit eden bir durumdur. Şiddetli otizm ve sınırlı ifade yeteneği olan 26 yaşındaki bir erkek hasta, iki gündür süren ateş ve melena şikayetiyle acil servise başvurdu. Hastanın acil servise gelmesinden iki saat önce, ağızdan beslenme denemesi sırasında hematemezis meydana geldi. Bakıcılar, son 10 gün içinde hastanın davranışlarında değişiklikler ve genel durumunda kötüleşme olduğunu bildirdi. Tanı amaçlı görüntüleme, özofagus duvarını delip prevertebral boşluğu geçen ve ucu torasik aortu delmiş gibi görünen büyük, kavisli metalik bir yabancı cisim ortaya çıkardı. Bu durum mediastinit ve AEF'ye yol açtı. Kardiyopulmoner baypas ile acil cerrahi müdahaleye rağmen, hasta ameliyat sonrası 24 saat içinde sepsis ve çoklu organ yetmezliği nedeniyle hayatını kaybetti. Bu vaka, özellikle iletişim bozukluğu olan hastalarda ciddi komplikasyonlara yol açabilen keskin metalik yabancı cisim yutulmasının ardından asemptomatik bir dönem olasılığını klinisyenlerin dikkate almasının önemini vurgulamaktadır. Asemptomatik dönem, lümen erozyonu, rüptür veya komşu yapılarla fistül gelişimi gibi önemli komplikasyonlara yol açabilir. Acil tıp hekimleri, özellikle yabancı cisim yutma öyküsü olan hastalarda, gastrointestinal kanamaya şiddetli enfeksiyon belirtileri eşlik ettiğinde AEF'yi şüphelenmelidir. Tanı teyit etmek ve acil cerrahi müdahale ihtiyacını belirlemek için bilgisayarlı tomografi (BT) görüntülemesinin zamanında kullanılması çok önemlidir. Bu vaka, potansiyel olarak yaşamı tehdit eden yabancı cisim yutulmasının tedavisinde kapsamlı değerlendirmenin gerekliliğini vurgulamaktadır.

Anahtar sözcükler: Aortoesofageal fistül; mediastinit; otizm; yabancı cisim yutulması.

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