

Embedded esophageal foreign body

A diagnostic challenge

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ABSTRACT

معظم حالات ابتلاع الأجسام الغريبة تحدث عند الأطفال خاصة في الذين تتراوح أعمارهم ما بين 1-3 أعوام. وفي معظم هذه الحالات يمر الجسم الغريب من خلال المريء دون أي مشاكل إلى المعدة، ولكن إذا كان محيط الجسم الغريب أكبر من محيط المريء أو له أطراف حادة فإنه يعلق وأحياناً يخترق الغشاء المخاطي مما يؤدي إلى ثقب في المريء أو ضيق في تجويفه. المريض المصاب دوماً يشكو من صعوبة في بلع الطعام فيلجأ حينها إلى الاستشارة الطبية. طرق التشخيص عديدة وتشمل التقييم التقليدي في التصوير الإشعاعي، المنظار، والأشعة المقطعية. نستعرض في هذا التقرير حالة طفلة تبلغ من العمر 21 شهراً رفضت تناول غذائها لأكثر من 6 أشهر، وفي الأسابيع الأخيرة أصبحت تتقيأ بشكل متكرر وازدادت حالتها سوءاً. الفحوصات المبدئية مثل أشعة الصدر، الأشعة الملونة للمريء، والمنظار لم تشخص الحالة ولكن الأشعة المقطعية كان لها الدور الفعال في الوصول إلى التشخيص. تم استخراج الجسم الغريب جراحياً من مريء الطفلة بعدما فشلت محاولات استخراجه عن طريق المنظار.

Esophageal foreign body (EFB) ingestion is of ubiquitous occurrence in pediatric population. Diagnosis and precise localization of non-radio opaque FB poses considerable challenge. Delayed presentation, poor history, and inconclusive esophagoscopy findings often lead to diagnostic delay. Multidetector computed tomography (MDCT) could be a great option in these situations. We present a case of EFB in a child who presented with failure to thrive, had negative fiberoptic endoscopy, ultimately diagnosed conclusively on MDCT examination.

Saudi Med J 2009; Vol. 30 (3): 433-435

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Received 21st July 2008. Accepted 12th January 2009.

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Esophageal foreign body (EFB) ingestion is of ubiquitous occurrence in pediatric population.¹ Most of the FB are passed eventually without complications. Rate of complication is related to the nature of the foreign body (FB). Sharp ones often embedding themselves within the mucosa or penetrating the lumen resulting in perforation or obstructive symptoms. These lesions are symptomatic drawing immediate attention to the lesion. Diagnostic methods in the assessment include conventional radiography, fiberoptic endoscopy, rigid esophagoscopy and occasionally computed tomography. We report a case of retained esophageal FB, which was clinically unnoticed and detected in routine assessment for esophageal symptoms. Role of multidetector computed tomography (MDCT) is highlighted.

Case Report. Twenty-one-month-old female child presented to pediatric emergency center with repeated vomiting of 2 weeks duration. Patient was not taking solid food for the last 6 months. Two weeks before the presentation, she was not even drinking fluids. On examination, vital signs were stable. Temperature was 36.7°C, heart rate 130 beats per minute, respiratory rate 30 breaths per minute, blood pressure 92/68 mm Hg. The patient was emaciated, not drooling. Growth charts showed delay in milestones. Laboratory investigations revealed normal complete blood count. Gliadin specific IgA and IgG were normal. Immunoglobulin E was 16.9 Ku/l (normal: 0-13). Esophageal manometry and pH examinations were also normal. Initial fiberoptic endoscopy was reported normal. Biopsy of stomach and upper intestine revealed moderate *Helicobacter pylori* positive gastritis, and chronic inflammatory cells in lamina propria. Further patient underwent chest radiography, which was unremarkable (**Figure 1a**). Subsequent barium esophagography through a catheter revealed an area of narrowing of esophagus at D3-4 level. There was no extraluminal extravagation of contrast (**Figure 1b**). Distal esophagus was well specified and appeared normal. Since location of the stricture

was unusual, with initial negative esophagoscopy, MDCT exam was considered. Computed tomography examination demonstrated a metallic FB embedded in to the posterior esophageal wall, resulting in wall thickening and luminal narrowing. Multiplanar reconstructions and 3D rendering of the area of interest showed the likely nature of the FB to be a metallic foil of a beverage can (Figures 2a & 2b). Endoscopic examination was repeated, showed partially embedded metallic FB 11 cms from incisor (Figure 2c). Attempt to recover the FB through endoscopy failed both by fiberoptic and rigid endoscopes. Finally, the patient underwent

esophagotomy, through left sided cervico-thoracic approach. The esophagus was opened by longitudinal incision at the level of aortic arch and FB was located, separated from the esophageal wall and removed (Figure 2d). She had an unremarkable postoperative course in the hospital and was discharged. Post FB removal barium study was essentially normal apart from demonstration minimal irregularity of esophageal lumen at the site of FB. Patient remained asymptomatic and 6 months later, she gained weight.

Discussion. Esophageal FB are of common occurrence and several large series are reported in the literature.¹⁻³ Most of the EFB present in acute setting leading to immediate attention and prompt management. Balci et al² observed in their large series of 1116 patients that, 83.2% were admitted within the first 12 hours, 9.1% within 12-24 hours and 7.1% later than 24 hours. Six patients (0.5%) were admitted to hospital after 3 days. Delayed presentation is unusual and uncommon manifestation of EFB. Presenting symptoms are hypersalivation, inability to swallow, cervical pain, wheezing, respiratory infections, hemoptysis, and so forth. Location of the FB varies depending on the nature of FB. Metallic objects were common in the upper esophagus, the food in the middle esophagus and non-opaque objects in the lower third of esophagus.² Conventional radiography of chest with frontal and lateral projection is the first line

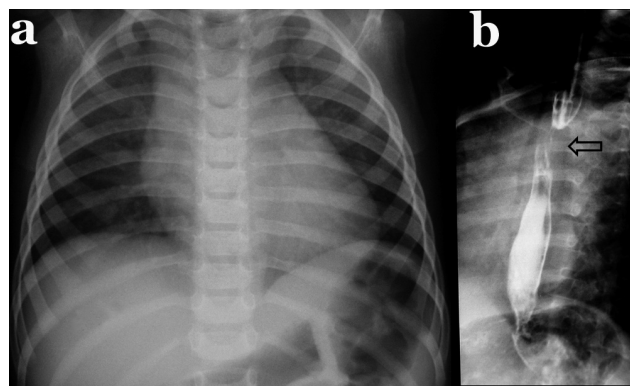


Figure 1 - a) Plain radiography of chest is unremarkable whereas b) barium esophagography revealed an area of narrowing with a posterior impression (arrow) in upper esophagus.

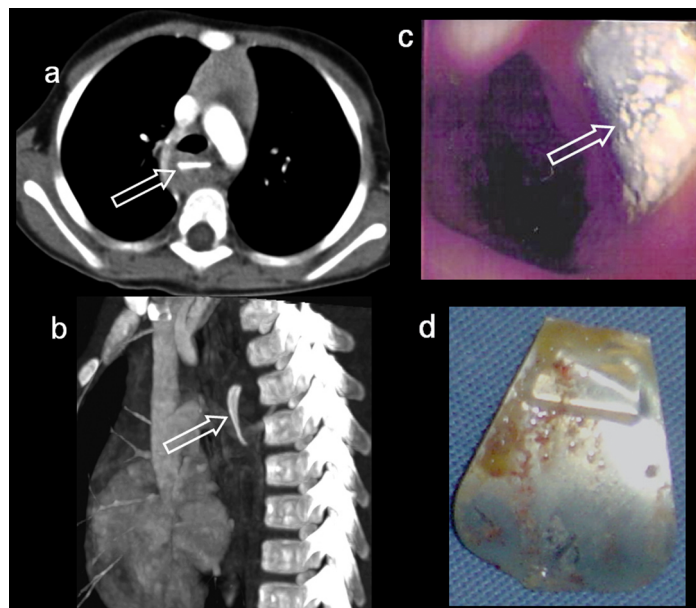


Figure 2 - a) Axial contrast enhanced computed tomography demonstrate linear, metallic foreign body with associated esophageal wall thickening (arrow). b) Reconstructed sagittal images shows characteristic shape and orientation of foreign body (FB) (white arrow) c) Endoscopic view of the FB. d) Photograph of FB after surgical removal.

of radiographic assessment in case of suspected EFB. Plain radiography is sensitive in detection in metallic FB due to their high atomic number, leading to easy differentiation from surrounding structures, thus facilitating detection. Computed tomography has not been used routinely for the evaluation of suspected EFB. However, in the case of the opaque chest or of a peritracheal or peniesophageal mass it may be useful to delineate abscess versus soft tissue or better define the FB if surrounded by infected tissue.⁴ Role of CT has been highlighted in the detection of overlooked EFB.⁵ Although CT is more frequently used than before, for chest applications, it is underutilized for detection of esophageal FB. Computed tomography has established itself to be an accurate, noninvasive technique for evaluating the structures of the mediastinum, including esophageal musculature. Barium studies, water soluble contrast studies of esophagus and esophagoscopy remain the primary imaging methods for diagnosing EFB. Endoscopic evaluation of esophagus has definite limitation in situation where there is an extensive edema in the region or if FB is partially or fully embedded with in esophageal musculature. Also if there is an esophageal stricture more distal esophagus will not be assessed.

Our patient represented an uncommon example where ingestion of FB was unnoticed at the initial stage. Thus, the patient was investigated later for non-specific esophageal complaints and failure to gain weight. Plain radiography, which is generally helpful in typical metallic FB, failed to detect the abnormality due to characteristic configuration of the FB in our patient. Thin metallic foils may be invisible to plain radiography if they are enface or if overlying dense bony structures. Chances of visibility can be good if FB is profiled accurately. At times, if there is clinical suspicion such radiography can be carried out under tailored fluoroscopy. Multidetector CT has a definite role in the

evaluation of such patients. Not only CT technology excels in demonstration of subtle density differences of tissues, it allows reconstruction in multiples planes, allowing the radiologist to predict the exact nature of relatively uncommon FB, as in our case. Radiation dose however is a concern in routine application of CT in EFB. Rationalization of indications depending on clinical background is necessary. From the technical standpoint low dose CT protocols can be used to reduce the radiation dose, by lowering mA to 20-25. Such protocols are found to be beneficial in evaluation of suspected bronchial FB.⁶

In conclusion, a case of clinically unsuspected unusual EFB is presented. Dilemma in the diagnosis is discussed with respect to the various diagnostic examinations performed. Role of MDCT in management of patient is highlighted.

References

1. Kay, Wyllie R. Techniques of foreign body removal in infants and children: Techniques in Gastrointestinal Endoscopy. *Techniques in Gastrointestinal Endoscopy* 2002; 4: 188-195.
2. Balci AE, Eren S, Eren MN. Esophageal foreign bodies under cricopharyngeal level in children: an analysis of 1116 cases. *Interact Cardiovasc Thorac Surg* 2004; 3: 14-18.
3. Athanassiadi K, Gerazounis M, Metaxas E, Kalantzi N. Management of esophageal foreign bodies: a retrospective review of 400 cases. *Eur J Cardiothorac Surg* 2002; 21: 653-656.
4. Kenna MA, Bluestone CD. Foreign bodies in the air and food passages. *Pediatr Rev* 1988; 10: 25-31.
5. Gamba JL, Heaston DK, Ling D, Korobkin M. CT diagnosis of an esophageal foreign body. *Am J Roentgenol* 1983; 140: 289-890.
6. Kosucu P, Ahmedtogly A, Koramaz I, Orhan F, Ozdemir, Dinc H, et al. Low-dose MDCT and virtual bronchoscopy in pediatric patients with foreign body aspiration. *Am J Roentgenol* 2004; 183: 1771-1777.

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Abu-Daff NS, Abu-Daff SN, Rubayaan A, Abu-Shaabani A. Laparoscopy in the treatment of a giant true epiphrenic diverticulum with migration of the gastrointestinal anastomosis staples. *Saudi Med J* 2009; 30(2): 295-298.

Baleela RM, Huessain MY, Ahmed ME. Anastomotic esophageal leak due to Taenia saginata following esophagectomy for esophageal cancer. *Saudi Med J* 2006; 27(2): 241-243.

Al-Mahbashi MY, Raja'a YA. Esophageal foreign bodies in Yemen. *Saudi Med J* 2005; 26(10): 1654-1655.

Shatnawi NJ, Bani-Hani KE. Ingested chicken bone leading to aorto-esophageal fistula. *Saudi Med J* 2005; 26(9): 1442-1444.