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Case Report

Radiolucent metallic foreign body: a case report

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ABSTRACT

A 13-year-old boy who accidentally ingested an aluminum beverage can pull tab. Neck and chest radiographs did not reveal any ingested foreign body. This case report illustrates poor negative predictive value of conventional radiographs for a suspected aluminum foreign body and demonstrates superiority of CT for this purpose. In such presentations, it is imperative to have a low threshold for performing further diagnostic evaluation with CT due to the relatively high radiolucency of aluminum.

Keywords: Foreign body, X-ray, CT scan, Aluminum, Children

INTRODUCTION

Plain conventional radiography is commonly used to evaluate the presence and location of metallic foreign bodies due to the erroneous assumption that all metal is readily demonstrated by this technique.[1-5] While true for metals used in coins, some toys-including aluminum have very low X-ray attenuation and are often inconspicuous on conventional radiographs. Medical professionals are frequently unaware of the relatively high radiolucency of aluminum. Here we report a case of ingestion of an aluminum beverage pull tab in a child and the importance of a high index of suspicion and an out of box approach in reaching to diagnosis.

CASE REPORT

A 13-year-old boy sought medical attention following an episode in which he believed he accidentally ingested an aluminum pull tab from a beverage can. Chest and neck radiographs (Figures 1 A-C) did not reveal evidence of an ingested foreign body, but history was clear. On physical examination, there was no focal tenderness or evidence of drooling. Patient denied vomiting tab and maintained that he had persistent chest pain that he believed was due to presence of aluminum beverage pull tab. Treating physician believed that negative chest X-ray not sufficient to exclude possibility of an ingested aluminum pull tab and therefore pediatric gastroenterology team consulted for diagnostic endoscopy. Endoscopic removal of pull tab from middle portion of esophagus performed uneventfully and patient discharged (Figures 2 and 3).

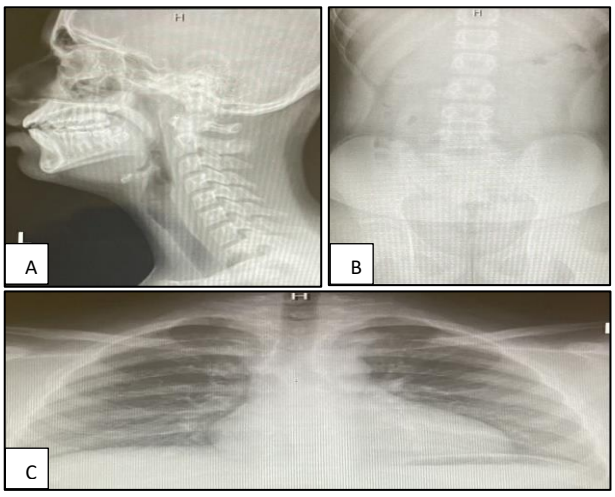

Figure 1 (A-C): Lateral soft tissue neck X-ray showing no foreign body, AP view of abdomen with no foreign body and X-ray chest showing no foreign body.

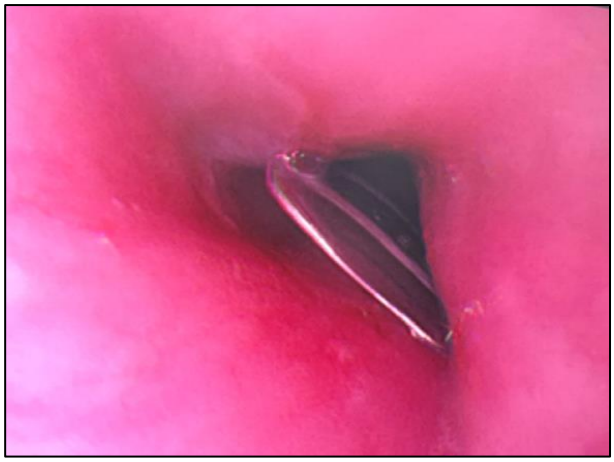

Figure 2: Endoscopic view of mid-esophagus showing aluminum can tab stuck.

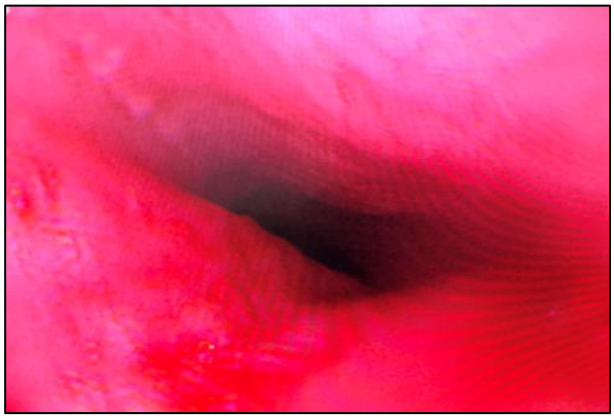

Figure 3: Endoscopic view of mid-esophagus after retrieval of foreign body.

DISCUSSION

Although pull tabs of aluminum beverage cans are unusual foreign bodies, they have been reported in both pediatric and adult populations.[6,7] Esophageal impaction may be suspected clinically from difficulty in swallowing and retrosternal discomfort.[8] Management of this clinical condition should include inspection of the oropharynx and radiography of the neck and chest if the foreign body is thought to be radio-opaque. Aluminum has a low radiodensity, but this fact is not widely well known. A case report by Bartalena et al demonstrated that radiographs of the neck, chest, and abdomen were not adequate to exclude esophageal impaction of an aluminum foreign body.[9] The minimal thickness of steel detectable in vivo is 0-12 mm, and aluminum is 10 times less radio-opaque. The average thickness of an aluminum pop is 0 35 mm. Aluminum foreign bodies may be easily missed on plain radiographs. If symptoms persist but no foreign body has been identified the metal detector should be used as a preliminary scan before endoscopic intervention. One previous report showed that metal detectors can be used safely and reliably in children suspected of having ingested metallic foreign bodies.[10]

Since the metal detector has several advantages (easy to use, inexpensive, and radiation-free) it should be the first screening test for children who ingested a metallic foreign body. Moreover, the radio-opaque ingested metallic foreign bodies can be detected by radiological imaging and are therefore easy tasks for the emergency medicine physician. On the contrary, aluminum has lower opacity than other metals and physicians must accordingly be aware that this can result in missing aluminum foreign bodies on radiograms.[8,9] Physicians must be aware of the low radio density of aluminum because superficial assessment of radiographs may result in missed aluminum foreign bodies. In this case, metal detector screening should be mandatory for the investigation.

CONCLUSION

Metallic foreign bodies are usually radio-opaque and can be easily picked by conventional radiography but care should be taken when dealing with low-density metallic bodies like aluminum, these foreign bodies can easily be missed with plain X-ray and therefore it is prudent to use a CT scan for locating such metallic foreign bodies. In this case, metal detector screening should be mandatory for the investigation and should routinely be used in emergency departments.

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