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Case Report

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Coin Ingestion in an 8-Year-Old Child; An Atypical Presentation

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Abstract

Foreign body ingestion can occur in the children of all ages but it's more common between 6 months to 4 years of age. Most ingested foreign bodies will pass through the gastrointestinal tract spontaneously without any intervention. Coins are one of the usual ingested objects. Coins in the esophagus are often oriented coronally in the erect chest X-ray and tracheal foreign bodies are more commonly in the sagittal orientation. Here, we report an 8-year-old boy who was brought to our emergency department, after an accidental ingestion of a coin, 30 minutes prior. On arrival, he was alert, awake, hemodynamically stable, without any distress, dyspnoea, drooling, odynophagia or other gastrointestinal or respiratory symptoms. Chest x-ray revealed a metallic foreign body consistent with coin with sagittal orientation, which raised the concern for airway foreign body. Despite the patient being stable and completely asymptomatic, he was admitted in the pediatric surgical ward for close observation and serial examination. Repeat CXR and AXR 6 hours post admission, revealed the coin location below diaphragm in the stomach. He was subsequently discharged home with advice and arranged outpatient follow-up. The larger size of esophagus in the older children may increase the probability of the esophageal sagittal orientation, and due to high incidence of an esophageal ingestion rather than a tracheal aspiration, a sagittally oriented coin should be considered as esophageal ingestion unless the contrary is proved.

Keywords: Children; Coin; Esophagus; Foreign body; Ingestion; Trachea;

Introduction

Foreign body (FB) ingestion and food bolus impaction occur commonly in the children of all ages; however, the most common age is 6 months to 4 years. Older children with underlying psychiatric problems are susceptible to ingest FBs and a mental health assessment might be required [1]. Most of ingested foreign bodies will pass spontaneously without any intervention and coins are one of the usual ingested objects in this population

[2-3]. Emergent intervention usually is needed in the symptomatic patients mainly with drooling, chest pain, and stridor or other red flags including:

- Button batteries lodged in the esophagus
- Large objects >6 cm long and/or wider than 2.5 cm
- Magnet + metal object or >1 magnet ingestion
- Lead based objects failing to transit through the stomach

High risk children: the previous GI surgery, tracheoesophageal fistulas or stenosing lesions.

However, in the absence of the above signs and symptoms and red flags, lodged esophageal coins can be observed for 12 to 24 hours as they will commonly pass spontaneously [4]. Distal esophageal coins are more likely to pass spontaneously than the proximal coins. Serial radiographs are necessary in the conservative management [5-6]. Coins in the esophagus often oriented coronally (face on the frontal radiograph and edge on the lateral view), otherwise tracheal placement is more likely in the sagittal orientation [7].

Case presentation

An 8-year-old boy was brought to the emergency department by his parents after accidentally swallowing a coin thirty minutes prior. On arrival, he was alert and oriented, Apyrexial, and haemodynamically stable; with a pulse rate of 82 beats per minute, respiratory rate of 21 breaths per minute, oxygen saturation of 96% (in room air), and his blood pressure was 105/65 mm Hg. He was in no apparent distress but was complaining of mild retrosternal discomfort without any nausea, vomiting or other GI symptoms. Despite no evidence of respiratory distress or any sign to suggest F Baspiration to locate the exact location of the coin a Chest and Abdominal X-ray were obtained. Surprisingly the coin was found to be in a sagittal plane and seemed it had passed through the vocal cords on the frontal chest radiograph (**Figure 1**). He was admitted to the pediatric surgery ward for close observation and serial examination and possible intervention if any symptoms or signs arise. However, repeat frontal chest and abdominal x-rays, 6 hours post admission, demonstrated the coin below the diaphragm and in the stomach (**Figure 2**). Patient remained stable and completely asymptomatic and subsequently was discharged home with advise and arranged outpatient follow up.

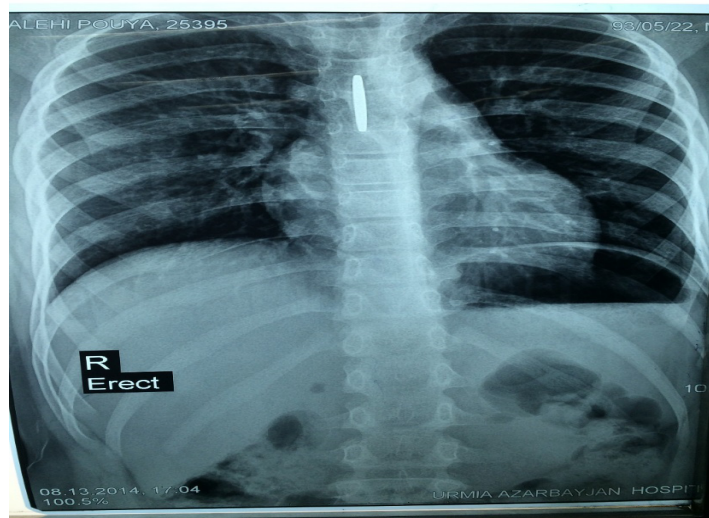


Figure 1: Coin sagittal orientation in AP erect CXR.



Figure 2: Abdominal X-ray after 6 hours.

Discussion

Most ingested coins pass through the gastrointestinal tract spontaneously. However, they may lodge in the esophagus, most commonly at the thoracic inlet and mid esophagus at the level of the aortic arch or gastroesophageal junction. The majority of metallic objects will show up on X-ray with the exception of aluminum. Consider imaging in suspected or known button battery, magnet, other high-risk radiopaque object, unknown object, high risk or symptomatic child [5-7].

The theories behind the coin's sagittal orientation in the trachea include the vocal cords longitudinal orientation and the C-shaped cartilaginous rings of trachea that cause the larger anteroposterior diameter. The causes of coronal esophageal orientation are horizontal plane of the tongue and laying of the rigid spine to the esophagus posteriorly that lead to the flat coin to lay with the anterior margin of the vertebral body [7].

Despite this classic teaching that the coins with sagittal orientation on frontal chest radiograph passed through the airway has been perpetuated in lectures and textbooks but it is not supported by peer-reviewed literatures [8-10]. Only in one case among six patients with aspirated coins in the trachea reported in the literature the orientation was specified, and in another five cases the orientation of coins was coronal rather than sagittal [4,11,12].

Jackson C et al in 1936 reported a list of 310 aspirated or ingested coins or coin like foreign bodies that have been removed from the "air and food passages." Only four objects were in the airway. Despite the authors' comment that "flat objects like coins always lie with their greatest diameter in the coronal plane in the esophagus" and "in the sagittal plane in the trachea" two of the four airway coins had a coronal orientation [7] reported a

child with an esophageal coin that seen on sagittal orientation at anteroposterior chest radiograph and as a disk in the lateral view. These findings were typically associated with tracheal ingestion. They concluded that clinicians should be wary of making the diagnosis of foreign body aspiration of coins by relying on single-view radiographic findings alone and using additional imaging to help further localize swallowed coins in suspected patients [13] reported a child with esophageal coin that radiographic findings showed a tracheal location. They diagnosed the correct location of coin by using both anteroposterior and lateral neck/chest views [14]. Reported the largest series of sagittally oriented esophageal coins. Seven of the eight cases lodged in the aortic arch level and another one coin was at the distal esophagus below the aortic arch level (an atypical location). The average age was 7.8 years and only three of them were younger than 5 years. They explained that an ingested coin with an atypical sagittal orientation in the esophagus may be misinterpreted as tracheal coin on a frontal chest radiograph. They concluded that as the ingestion of coins are more common than aspiration of coins, a sagittal coin on a chest radiograph is more likely to be within the esophagus than trachea. Peer-reviewed literature does not confirm the classic belief that a sagittal orientation suggests a tracheal location and there are more documented coronally airway coins than the sagittally ones [15] reported an 8-year-old male with complain of having accidentally swallowed a coin. The child demonstrated no evidence of respiratory distress, but regard to the coin's orientation on x-ray there was concern about tracheal location. The coin was oriented sagittally. However, on closer examination of both the lateral and A-P radiographs, it would be obvious that the coin was aligned alongside and outside of the tracheal air column [16]. With regard to high incidence of esophageal ingestion rather than tracheal aspiration, it is logical to consider sagittally oriented coins in frontal chest radiograph within the esophagus and request a lateral chest radiograph for confirmation.

Conclusion

With regard to this case and some other case reports we believe that the larger size of esophagus in older children may increase the probability of esophageal sagittal orientation and due to high incidence of an esophageal ingestion rather than a tracheal aspiration, a sagittally oriented coin in a frontal chest radiograph should be consider as esophageal ingestion unless the contrary is proved.

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