A CHOKING CHILD WITH UNEXPECTED FOREIGN BODY

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ABSTRACT

Foreign body ingestion is a common problem in children age from 6 months to 3 years as they explore things by placing them in the mouth. Coins are the most common being ingested and not surprisingly other sharp foreign bodies such as needles, fishbone, brooch or an open safety pin can also be accidentally ingested by them. We present a case of the ingested open safety pin in a 10-months-old girl. She presented with choking and a brief cyanosis episode. Physical examinations were unremarkable but the chest radiograph showed an open safety pin at the mid oesophagus. She was put under general anaesthesia for removal of the open safety pin however retrieval was unsuccessful. Repeated chest radiograph showed the safety pin had migrated further and 3 days later it was spontaneously eliminated in her stool. We reviewed the urgency, management and techniques for the removal of an open safety pin.

Keywords: Foreign body ingestion; Open safety pin; Children

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Introduction

Sharp foreign body (FB) ingestion in children is known to be associated with higher morbidity or mortality. The sharp endpoint of the FB has a greater probability of getting partially embedded in the wall of the oesophagus and subsequently can cause perforation thus needs urgent removal. Other complications such as trachea-fistula, and/or abscess formation, peritonitis, an aorto-oesophageal fistula, and even death was also reported [1]].

Safety pin ingestion in paediatric population is rare in our country as compared to Turkey where it is more common due to their local’s cultural belief that use the safety pin to attach the blue bead to toddlers’ shirt [2]. Various methods and techniques to remove the open safety pin have been described in the literature. Recently, the usage of fibreoptics endoscope becoming popular though rigid oesophagoscope is still the general rule. Nevertheless, all of these techniques need practice and experience.

Case Report

A 10-month-old previously healthy girl presented to our emergency department following a choking episode while being fed with small sliced of guava by her mother in the car. The parents tried to remove the material by inducing vomiting using fingers.

They rushed her to the hospital when they noted she became cyanosed for a few minutes. Heimlich manoeuvre was performed in the red zone of the emergency department (ED) and subsequently, she became pink with good crying.

When the Otorhinolaryngology (ORL) team reviewed her in the ED, her vital signs were stable. There was no stridor, audible wheeze or respiratory distress. Physical examination was unremarkable but the chest radiograph showed the open safety pin at the mid oesophagus. She was put under general anaesthesia for removal of the open safety pin however retrieval was unsuccessful. Repeated chest radiograph showed the safety pin had migrated further and 3 days later it was spontaneously eliminated in her stool. We reviewed the urgency, management and techniques for the removal of an open safety pin.

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distress. The lung auscultation revealed equal air entry bilaterally with good vesicular breath sound. Abdominal examination was unremarkable.

Plain chest and neck radiograph (Figure 1) were performed after the patient had been stabilised and surprisingly it showed an open safety pin in the mid oesophagus. The safety pin was worn by her mother earlier on her hijab before she took it off in the car and unnoticeably taken and swallowed by her child.

As the sharp FB warrants urgent removal, she was immediately posted for direct laryngoscopy, esophagoscopy and removal of a foreign body under GA.

A paediatric bronchoscope size 3.5 was chosen instead of a rigid oesophagoscope based on her body weight and age. A zero-degree telescope was used simultaneously to guide insertion of the bronchoscope further. The sharp point of the open safety pin was visualized at the mid oesophagus (Figure 2).

![Figure 1(a)](image1a.png)  
*Figure 1(a). Open safety pin seen at the level of thoracic vertebrae (T3-T4).*

![Figure 1(b)](image1b.png)  
*Figure 1(b). Lateral view confirmed the foreign body in the esophagus.*

![Figure 2](image2.png)  
*Figure 2. Telescopic view of the sharp end point of the open safety pin in the oesophagus.*

![Figure 3](image3.png)  
*Figure 3. The red arrow pointed to the position of the safety pin at the level of T10 – T11 post procedure.*
However, we faced difficulties in manipulating the forceps in a small lumen. Profuse saliva accumulating in the oesophageal lumen made it further difficult to grasp the sharp end of the safety pin. Multiple attempts using optical forceps were also in vain and the secretion in the oesophageal lumen started to become blood-stained with worsening mucosa oedema, the procedure was abandoned and plain radiograph was repeated. There was no pre- or post-operative procedure complications.

She was kept intubated in the intensive care unit (ICU) for post operative monitoring and further management. The repeated chest radiograph showed the open safety pin had migrated to the lower part of the oesophagus (Figure 3) with no signs of pneumomediastinum or lung collapsed.

She was then referred to paediatric surgery specialty and conservative management with serial radiograph was decided as she was stable with no symptoms. She was extubated and being observed in the ward. Her parents were advised to check their daughter diapers every change before throw it and to report urgently if any acute abdominal pain arise.

Three days later the safety pin was spontaneously eliminated in her faeces. She was discharged well with no complications.

Discussion

Approximately 40% of the ingested foreign body takes place unwitnessed by the parents or care giver. Ingestion of sharp FB can lead to catastrophe if it is not recognised early. However, most sharp objects follow Jackson’s axiom: “advancing points puncture, trailing does not”, and often pass the GI tract uneventfully.

A sharp FB warrants early retrieval as it may penetrate the oesophageal wall causing perforation and leads to pneumomediastinum. Delay in removal will also induce oedema of the oesophageal mucosa, making it more difficult to retrieve. The buried sharp end of a FB in the oedematous mucosal fold of the oesophagus is even more difficult to visualize and retrieve. Factors to be considered before removal of a safety pin depends on its location (oesophageal or gastric), configuration (open or closed) and orientation (pointed end proximal vs. distal). The other important factors are the experience and expertise available in the centre to decide the best and safe method. Availability of correct instruments with correct size according to patient’s age is vital to ensure successful retrieval.

Charalampos Skoulakis et al reported the use of paediatric Jasberg oesophagoscope where the sharp object being grasped and brought into the lumen of the endoscope to guard the point against being punctured again.

In our case, an appropriate size bronchoscope for the 10-month-old baby was used for removal with the telescope in place. Aparajita Mitra and Minu Bajpai published a novel technique of removal impacted sharp oesophageal foreign body using paediatric bronchoscope. It was preferred due to numerous forceps available for removal. The bronchoscope also being a straight tube with a larger internal diameter for a similar outer circumference. It allowed the passage of the forceps with an adequate field of vision and easier manipulation. The telescope also could be fixed with bridge and presence of suction channel further aided the procedure. There was a higher success rate than flexible endoscopy (94-100% vs 76 – 96.5%) reported but with similar perforation rates risk (0.34% vs 0-0.5%) [8].

Recently, the use of flexible fibre-optics endoscopes is gaining popularity as an alternative to the above-mentioned techniques. The North American Society for Paediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN) suggests the removal of sharp FB is emergency (less than 2 hours) if symptomatic and urgent (less than 24 hours) if asymptomatic. Several authors have described how to close and successfully removed an open safety pin. The open safety pin with the sharp end pointed caudally can be withdrawn with tooth forceps. If the sharp end pointed proximally, it can be pushed down to the stomach and manipulated to close the safety pin before removal to avoid any harm to gastric or oesophageal mucosa. Those techniques described earlier requires experience and expertise to perform, unfortunately it is not available in our center.

Owing to the technical difficulty in retrieval and possible subsequent oesophageal perforation the “watch and wait policy” can be applied. Most of the safety pins will pass uneventfully once the pins reach the stomach, so daily observation with x-rays is recommended by several authors. If there is no progress of the safety pin after 3 days or the
Conclusion

The removal of an open safety pin with a sharp end pointed proximally in the oesophagus of an infant is a challenging task to the managing team. Urgent removal is required if it is in the oesophagus. Appropriate and suitable instruments are important to decide the technique of retrieval. Correct and timely decision making is also prudent in managing such case to avoid the complications such as oesophageal perforation even though the conservative management with daily radiograph can be applied if it reach the stomach.

References


