

Case Report

An 11-month-old infant with laryngeal and pharyngeal injuries due to aspiration of an L-shaped metal fragment: A case report

Kyohei Sakurai ^{a,*}, Yoshimatsu Ehama ^a, Naomasa Shimizu ^b, Makoto Kobayashi ^c^a Division of Emergency Medicine, Hakodate Goryoukaku Hospital, Hakodate City, Hokkaido, Japan^b Division of Pediatrics, Hakodate Goryoukaku Hospital, Hakodate City, Hokkaido, Japan^c Director of Surgery and Intensive Care Center, Hakodate Goryoukaku Hospital, Hakodate City, Hokkaido, Japan

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ABSTRACT

Airway foreign bodies require urgent removal owing to their life-threatening risks. Symptoms such as coughing and wheezing typically appear immediately after aspiration, although symptom improvement can delay diagnosis and treatment. This report describes a rare case of aspiration of an L-shaped metal fragment that injured the larynx and pharynx. The patient was an 11-month-old girl who developed a persistent cough while eating baby food. Her primary care physician initially discharged her with mild hoarseness, but persistent hoarseness led to an emergency room visit. Although her vital signs were stable, crying revealed hoarseness and inspiratory wheezing. Suspecting an airway foreign body, a chest X-ray revealed a metal object in the neck. Computed tomography showed that the fragment's edges were in the larynx and pharynx, spanning the arytenoid cartilages. The pharyngeal end of the fragment had punctured the posterior pharyngeal wall, and submucosal free air was observed. The foreign body—a thin and 2-cm-long L-shaped metal fragment—was removed under intravenous anesthesia using video laryngoscopy. Owing to the risks of emphysema, hematoma, and edema from inflammation of the posterior pharyngeal wall, the patient was intubated for 3 days and recovered well. As demonstrated, aspiration of irregularly shaped foreign objects can cause severe injury to surrounding structures. Careful diagnostic attention is crucial, and for suspected emphysematous lesions in the pharynx or mediastinum, endotracheal intubation and ventilatory support should be considered.

Introduction

Removing foreign bodies from the airway is crucial because airway obstruction can be life-threatening. It has reported that aspiration of foreign body is connected to high morbidity rates (10 %–20 %), and it is responsible for 7 % of accidental deaths in children under three years of age [1]. Commonly aspirated foreign objects in children include food, such as nuts and seeds, and small toy parts, in addition to metal objects such as pen caps, jewelry, and needles [2,3]. Severe symptoms, such as coughing and wheezing, typically occur immediately after aspiration; however, once the foreign body settles in place, symptoms may diminish, leading to delayed detection. Herein, we present a rare case of aspiration of an L-shaped metal fragment that caused injury to the larynx and pharynx, despite the patient presenting with only minor symptoms upon arrival.

* Corresponding author at: 38-3 Goryoukaku-cho, Hakodate City, Hokkaido 040-8611, Japan.

E-mail address: kyohey0113@gmail.com (K. Sakurai).

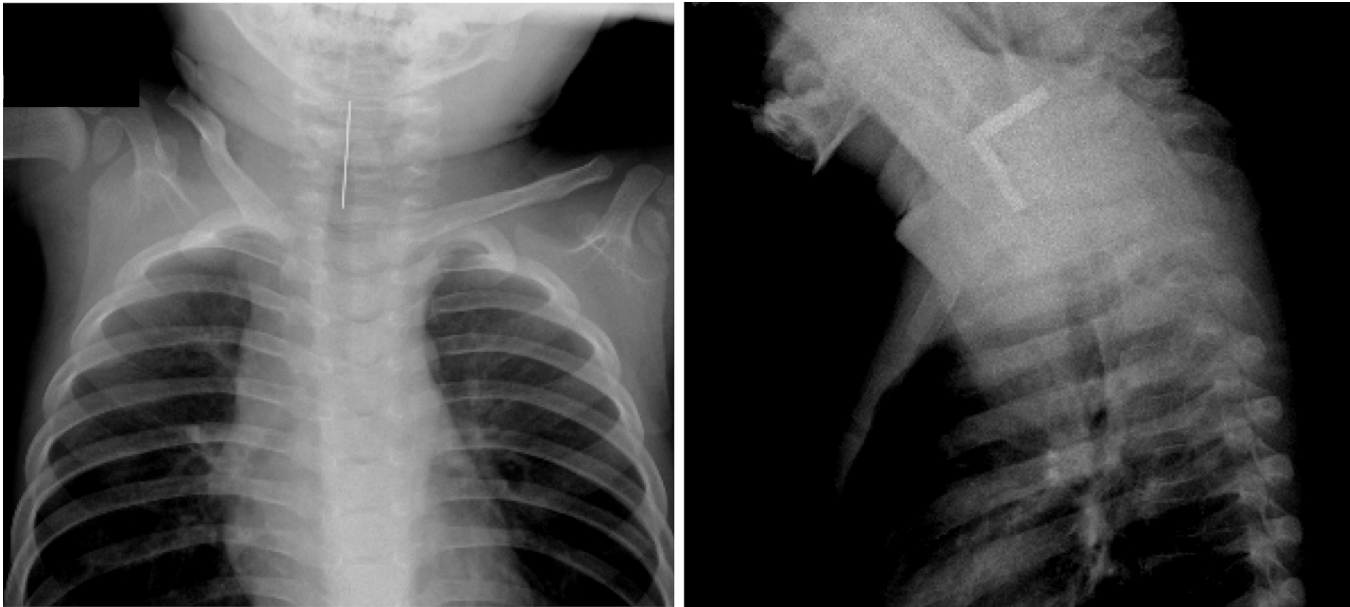


Fig. 1. Cervical chest radiograph showing an L-shaped foreign body shadow in the neck.

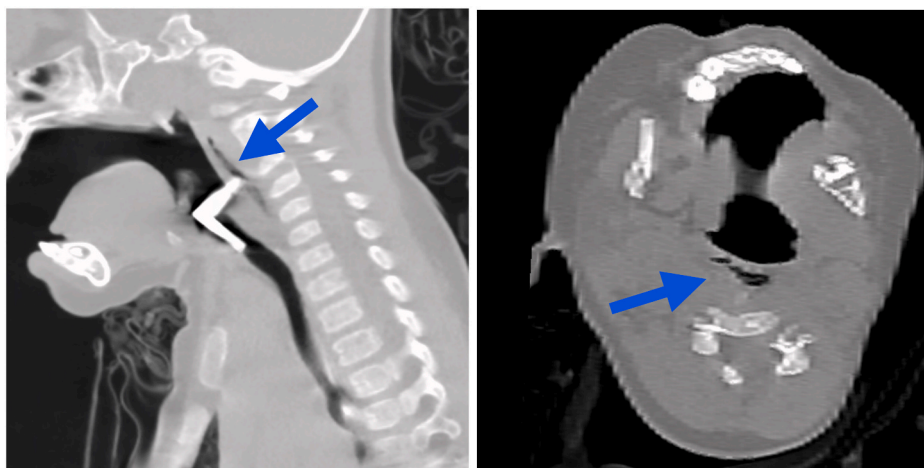


Fig. 2. Computed tomography images showing free air in the retropharyngeal space. Blue arrows indicate the free air. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

Case report

The patient was an 11-month-old girl, developing normally and weighing 8 kg. While eating baby food, she suddenly started coughing and crying uncontrollably. She initially visited her local doctor; however, because she appeared in a good mood, no examination or treatment was performed, and she was sent home. Nonetheless, her hoarseness persisted, and approximately 4 h after symptom onset, she presented to our emergency room.

Upon physical examination, her respiratory rate was 25 breaths/min, percutaneous oxygen saturation 100 % on room air, heart rate 100 beats/min, blood pressure 100/60 mmHg, and body temperature 36.3 °C. Hoarseness was noted when the child cried, but no abnormalities were observed upon oropharyngeal visual examination. Upon auscultation, mild continuous rales were heard during inspiration. Chest X-ray revealed a 2-cm-long L-shaped shadow in the neck (Fig. 1). Computed tomography (CT) revealed an L-shaped metal fragment straddling the arytenoid cartilages, with one end retracting into the glottis and the other penetrating the posterior pharyngeal wall, thereby causing submucosal free air (Figs. 2, 3).

Upon admission, intravenous anesthesia was administered, and the larynx was explored using a video laryngoscope. The metal fragment (Fig. 4) was removed using foreign body removal forceps. Shortly after removal, laryngeal fibers depicted swelling in the epiglottis, raising concern regarding potential severe respiratory complications. Moreover, given the presence of free air in the posterior pharyngeal wall in the CT scan and the risk of exacerbation of subcutaneous or longitudinal emphysema from crying, the patient was placed on ventilatory support. Laryngeal edema improved by day 3 of admission, and CT confirmed the resolution of the free air in the retropharyngeal space. The tracheal tube was removed on day 4 of admission after subsequent laryngeal fiberoptic confirmed the resolution of the laryngeal edema. The patient was discharged on day 5 with no further respiratory issues. A follow-up outpatient visited after 1 month reported no residual effects, including respiration- or swallowing-related problems.

Discussion

Airway foreign bodies are life-threatening owing to the potential for airway narrowing and obstruction, requiring prompt diagnosis and treatment. Children aspirate various foreign bodies with different materials, shapes, and sizes, and the symptoms and severity can vary depending on the location (e.g., in the airway or gastrointestinal tract) and form of the foreign body. Herein, the L-shaped metal fragment straddled the transition between the pharynx and larynx, injuring both areas. The perforation of the foreign body led to emphysema in the posterior pharynx and edema in the larynx, which were successfully managed through intubation to prevent airway obstruction.

Airway foreign bodies are typically diagnosed early owing to sudden coughing, wheezing, or severe breathing difficulties. However, once symptoms subside, they may be misinterpreted as respiratory tract infection or asthma. Further, symptoms can be alleviated when the foreign body fixates at a place [3,4]. Herein, the thin foreign body perforated the posterior pharyngeal wall but fixated at the sagittal plane, which potentially prevented severe airway obstruction symptoms. Similar reports of cases in which a foreign body located in both side of the airway and pharynx with a collateral damage to the retropharynx, as in the present case, were not found in previous publications.

For imaging diagnosis, bronchoscopy is often recommended for definitive diagnosis because X-rays may be radiolucent depending on the foreign body material [5]. Reportedly, advanced CT can accurately diagnose pediatric foreign body aspiration, reducing the need for unnecessary bronchoscopies while providing an acceptable radiation dose [6]. Herein, the metallic nature of the foreign body made it easily visible on X-rays and CT, allowing clear determination of its location and effects on surrounding tissues.

When submucosal free air due to a foreign body is found on the posterior wall of the pharynx, as in our case, there is a risk of

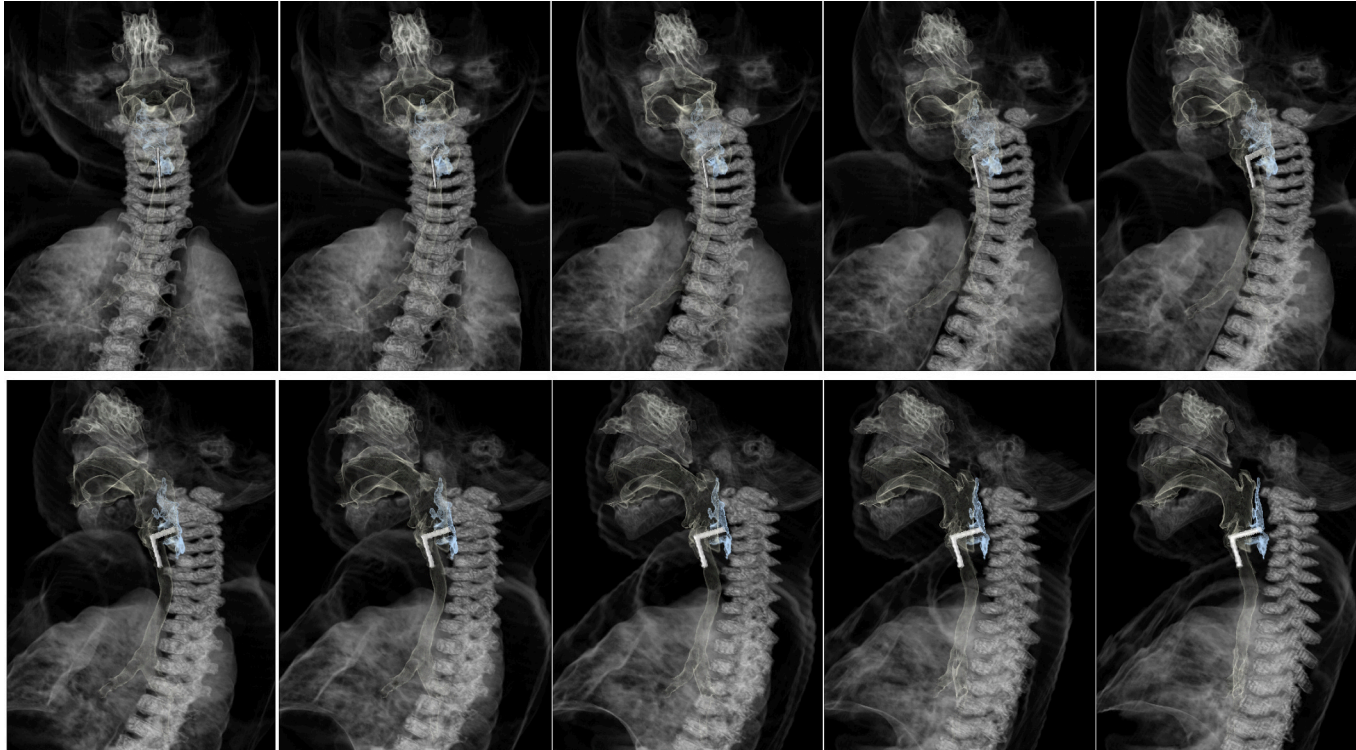


Fig. 3. Sequential images from three-dimensional reconstructed computed tomography, depicting a thin, L-shaped metal fragment located between the larynx and pharynx: one end is retracting into the glottis, while the other end is penetrating the posterior pharyngeal wall. The free air is painted light-blue which was extending to the retropharyngeal space. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

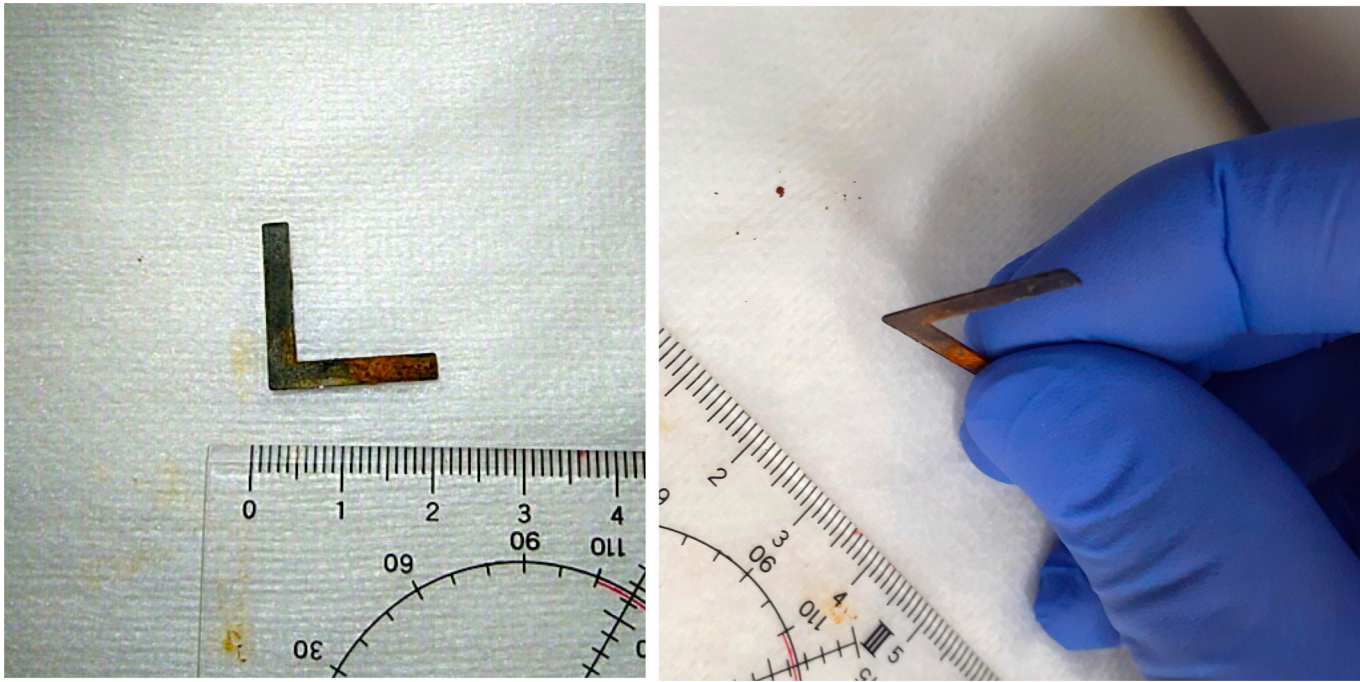


Fig. 4. Image of the removed foreign body: an L-shaped metal fragment; it was 1-mm thick, 2-cm long on each side, and rusted on all surfaces.

emphysema developing in the mediastinum due to crying. In such cases, endotracheal intubation should be selected because of concern for worsening respiratory status.

Conclusion

Special attention is required while diagnosing aspiration of irregularly shaped foreign bodies because they can unexpectedly damage the surrounding organs. If emphysematous lesions around the pharynx or in the mediastinum are suspected, ventilatory management should be considered.

CRedit authorship contribution statement

Kyohei Sakurai: Writing – original draft. **Yoshimatsu Ehama:** Data curation. **Naomasa Shimizu:** Supervision. **Makoto Kobayashi:** Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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