

Case Report

Glass in the glottis: A pediatric case report

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ARTICLE INFO

Article history:

Received 4 October 2014

Received in revised form 27 October 2014

Accepted 31 October 2014

Keywords:

Laryngeal foreign body

Airway foreign body

Glass

Pediatric airway

Foreign body aspiration

ABSTRACT

Foreign body aspiration in children is not a rare event; fortunately, death due to foreign body aspiration is. Nonetheless, choking is one of the leading causes of accidental death in children in the United States. Most airway foreign bodies are found in the bronchi and most foreign bodies are composed of seeds, pieces of food, or small metallic and plastic toys. Truly laryngeal foreign bodies are not commonly encountered. Glass presenting as an airway foreign body is exceedingly rare. In this case report, we present a patient who presented with two rarities: a large glass shard in the larynx.

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1. Introduction

Mortality due to pediatric foreign body aspiration is fortunately a rare occurrence. However, prior to the surgical expertise of Chevalier Jackson, mortalities due to airway foreign bodies were not rare events. Although the current mortality rate of airway foreign bodies is near 1%, this number neared 50% just over a century ago [1]. Nonetheless, “choking” was the third leading cause of death due to unintentional injury in children less than 1 year old and the fourth leading cause of death due to unintentional injury in children aged 1–4 years in the year 2007 in the United States [2].

The most common location for a foreign body to be found in the airway is in the right bronchus (58.5%), followed by the left bronchus (22.6%), the trachea (16.1%), and most rarely in the larynx (2.8%) [3]. Despite the rarity of truly laryngeal foreign bodies, the mortality rate of truly laryngeal foreign bodies remains unfortunately high, at 45% [4]. The multitude of objects that have been aspirated by children has frequently been documented in the literature and may be categorized into organic and inorganic materials [3]. Commonly cited organic materials include peanuts, sunflower seeds, grapes, candy, popcorn, and hot dogs. Commonly cited inorganic materials include pieces of plastic, metal, beads, and pins. Glass presenting as an airway foreign body has been

documented in very few case reports, such as the aspiration of glass windshield pieces after motor vehicle accidents in adults [5]. In the pediatric literature, a case report documents a child aspirating glass into the left bronchus after biting down on a glass mercury thermometer [6]. We present a case report describing the collision of two rarities: a child who presented with a large glass shard in the larynx.

2. Case report

The patient is a 15 month old male who presented to the emergency department at our tertiary care pediatric institution as a transfer from a community hospital due to concern for a foreign body in the airway. Approximately 5 h prior to arrival at our institution, the child's parents witnessed him placing an unknown object into his mouth. The parents performed an unsuccessful finger sweep of the child's mouth, after which the parents noted the patient coughed and then became stridorous and hoarse. They performed back blows as part of the Heimlich maneuver, to no avail, and then called 911. He did not lose consciousness and did not become cyanotic. He was transported to a local community hospital by ambulance. His pulse oximetry was greater than 97% on room air.

At the community hospital, the child was stridorous, though not in significant respiratory distress. His pulse oximetry was greater than 97% on room air. A peripheral IV was placed. Lateral and AP neck X-rays were obtained (Fig. 1a and b) which revealed a large, triangular shaped radiopaque foreign body at the level of the

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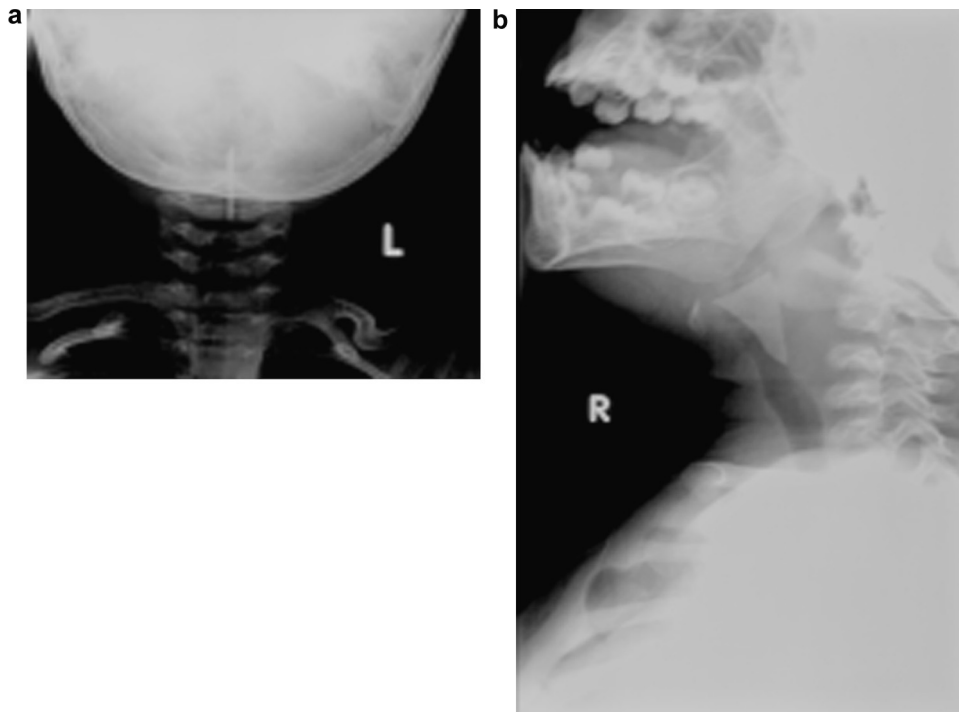


Fig. 1. (a) Anteroposterior neck radiograph demonstrating a radiopaque foreign body in the glottis and (b) lateral neck radiograph demonstrating a radiopaque foreign body in the glottis.

larynx. Vital signs documented by the transport team prior to departure from the community hospital showed a respiratory rate of 42 breaths per minute, a heart rate of 178 beats per minute, and an oxygen saturation of 97% on room air. The child was then urgently transferred by ambulance to the emergency department at our tertiary care children's hospital for evaluation by the otolaryngology service.

Upon arrival, the child was playful but hoarse, with mild stridor at rest which increased with agitation. He had mild tracheal tugging with inspiration. His lungs were clear to auscultation and he required no supplemental oxygen or medications. Vital signs showed a respiratory rate of 28 breaths per minute, a heart rate of 135 beats per minute, and an oxygen saturation of 99% on room air. The child was examined, the neck films were reviewed, and the decision was made to immediately proceed to the operating room for definitive management with direct laryngoscopy, rigid bronchoscopy, and removal of the airway foreign body.

In preparation for the procedure the Otolaryngology and Anesthesia teams met jointly to discuss the patient and to devise a plan for the airway. The patient's presentation and X-rays were reviewed. After careful consideration, the primary plan was to induce anesthesia using inhalational anesthetics through a face mask followed by direct laryngoscopy with a laryngoscope. If this was unsuccessful, a laryngeal mask airway (LMA) would be placed and laryngoscopy would be performed via a fiber optic laryngoscope inserted through the LMA. As is the case with all procedures that involve a difficult or tenuous airway, a tracheostomy tray would be available and open in the operating room in preparation for a scenario in which the laryngeal foreign body became dislodged and completely obstructed the airway either by manipulation during induction or by attempts at removal. These scenarios were discussed frankly with the patient's parents who signed a surgical consent for direct laryngoscopy, rigid bronchoscopy, removal of an airway foreign body and possible emergent cricothyroidotomy or tracheostomy.

In the operating room, general anesthesia was successfully induced via facemask inhalation using sevoflurane. A # 1 miller

blade was used to expose the larynx which was then visualized with a Hopkins rod telescope. A large glass shard was noted to be wedged sagittally in the glottis (Fig. 2). The glass shard was triangularly shaped with the tip located under the true vocal folds and the base wedged just above the true vocal folds. There was no bleeding. Using large alligator forceps, the glass shard was firmly grasped and then removed under direct visualization. Significant force was needed to remove the shard which was tightly wedged into place. After the glass was removed from the larynx, moderate mucosal bleeding was noted from a posterior glottic mucosal laceration which was thin but exposed cartilage (Fig. 3). A rigid ventilating bronchoscope fitted with the Hopkins rod telescope was then used to visualize the airway below the level of the glottis. The subglottis, trachea, carina, and mainstem bronchi were unremarkable, and no other foreign bodies were noted. The mucosal bleeding was controlled with afrin soaked pledges. Once it subsided the mucosal laceration was again examined with the Hopkins rod telescope while the patient was spontaneously breathing. The mucosal laceration did cover the cartilage and no suture was placed. The patient was awakened and taken to the intensive care unit breathing comfortably on room air. The patient was not intubated. He received one dose of intravenous dexamethasone in the operating room.

The patient was observed overnight in the intensive care unit where he did well and was without the need for any supplemental oxygen, nebulized medications, or post-operative steroids. The only medication the patient received in the intensive care unit was acetaminophen. On post-operative day one, the patient was eating well, was comfortable, had stable vital signs and was without stridor or retractions. He displayed mild but improved hoarseness. After demonstrating adequate oral intake and continued quiet respirations, the patient was discharged home on post-operative day one.

Four months following the foreign body aspiration, the patient was taken back to the operating room for a second look laryngoscopy. His hoarseness had resolved and he has no episodes of respiratory illness, croup, or noisy breathing. The patient's larynx was noted to be well healed without scarring, stenosis, or signs of the previous trauma.

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