Case Report

Superior thyroid artery injury following foreign body ingestion in an intellectually disabled patient: A case report

ABSTRACT

This case report highlights complexities in an intellectually disabled adult who ingested a chicken bone, resulting in a rare complication—superior thyroid artery injury. Presentation, diagnostic challenges, and a multidisciplinary approach are detailed. Initial attempts at esophagoscopy under general anesthesia were hindered by blood coughing, leading to a change of plan. Subsequent findings revealed mucosal edema and continuous bleeding from the site. Challenges in anesthetizing intellectually disabled individuals are emphasized, stressing tailored induction methods. The case concluded with successful embolization but developed neurological complication which was successfully managed showcasing the significance of a collaborative and adaptable approach.

Key words: Foreign body esophagus, middle cerebral artery infarct, tracheostomy, vascular injury

Introduction

Foreign body esophagus/upper airway is a common presentation at the emergency room following fishbone/chicken bone ingestion.[1] Foreign body ingestion is commonly seen in children, adults with psychiatric illness, intellectually disabled adults, adults with alcohol intoxication, and edentulous adults.[2] Management of these ingested foreign bodies depends on the location and type of foreign body ingested. Rarely do these cases present with complications like vascular injury, esophageal perforation, and mediastinitis, which might require surgical management.[3,4] Foreign bodies in the hypopharynx and upper esophagus are usually removed by rigid esophagoscopy.[2] We report a case of superior thyroid artery injury following chicken bone ingestion by an intellectually disabled patient and its management. A written informed consent was obtained from the patient for publication of this case report.

Case Description

A 42-year-old male presented to the emergency room with difficulty swallowing, increased salivation, and a sensation of a foreign body in his throat persisting for 4 days after swallowing a piece of chicken meat. He also reported a change in voice. This patient has a history of diagnosed intellectual disability since childhood and is known to consume alcohol.

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Dharun Jims D A, Suryanarayanan Soundrarajan, Mekala RanjithKumar, Muthapillai Senthilnathan

Department of Anaesthesiology and Critical Care, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Pondicherry, India

Address for correspondence: Dr. Mekala RanjithKumar, Office of Anaesthesiology and Critical Care (Old Institute Block, 2nd Floor), JIPMER, Puducherry - 605 006, India.
E-mail: ranjithkumar.kmc@gmail.com

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Imaging revealed a normal chest roentgenogram (X-ray), whereas computed tomography (CT) of neck revealed a foreign body lodged in the pharynx, extending below the epiglottis at the level of the aryepiglottic fold [Figure 1]. A collaborative team of anesthetists and otolaryngologists opted for a procedure to remove the foreign body via rigid esophagoscopy under general anesthesia.

In the emergency room, the patient underwent preanesthetic evaluation. The assessment categorized the patient as class 1 obese, and they displayed noncooperation during a comprehensive airway examination. While wheezing was observed in both chest fields, the systemic examination did not reveal any abnormalities. Routine lab tests yielded normal results, and there was no recent history suggestive of upper or lower respiratory tract infections.

The initial attempt at induction using sevoflurane was interrupted due to violent coughing with blood, prompting a shift to a lateral position to prevent aspiration. After stabilizing the patient, a subsequent induction involved administering fentanyl, propofol, and succinylcholine, leading to successful airway management with a 6.5 size endotracheal tube. Laryngoscopy identified a 'V'-shaped chicken bone [Figure 2] lodged in the posterior pharyngeal wall at the aryepiglottic fold level, which was successfully removed using retrieving forceps. Following the removal, mucosal edema and redness were observed at the site of impaction. A rigid esophagoscopy displayed no mucosal injury in the upper esophagus. However, continuous bleeding from the pharynx necessitated the use of a throat pack to control bleeding, and plans for a detailed examination were scheduled for the following day. In the elective operating theater the next day, further examination revealed mucosal edema in the lateral pharyngeal wall, identifying a tear in the pyriform fossa with ongoing bleeding. Consequently, a decision was made for tracheostomy due to the persistent bleeding source from the injured branch of the left superior thyroid artery, confirmed through CT angiography and managed via embolization using polyvinyl alcohol.

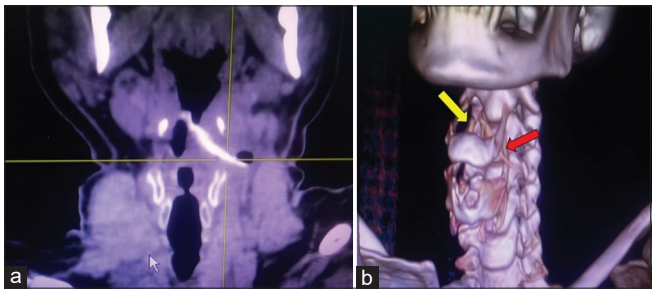

Figure 1: (a) Coronal section of computed tomography of head and neck showing the foreign body; (b) three-dimensional multiplanar reconstruction imaging of the neck showing the short segment (yellow arrow) and the long segment (red arrow) of the foreign body

The day following the procedure, the patient experienced weakness in the right upper and lower limbs. This weakness was attributed to occlusion in the cortical and subcortical branches of the left middle cerebral artery. The treatment plan included aspirin and atorvastatin, which led to gradual improvement of the right-sided weakness. After 9 days of postoperative care, the patient was successfully decannulated and discharged on the 11th day.

Discussion

Vascular injuries resulting from foreign body ingestion are infrequent occurrences. Among reported cases, the common carotid artery tends to be the most frequently injured vessel, with occasional reports of aortic injuries.[5,6] Common carotid artery injuries may manifest acutely as hematemesis due to direct vascular trauma or later as a ruptured pseudoaneurysm.[5] Aortic injuries typically present with severe hematemesis and chest pain. The mechanism of vascular injury is believed to be either direct trauma from a migrated foreign body or cervical infection stemming from a foreign object.[6] The first documented case of a foreign body-related carotid artery injury was reported in 1932, diagnosed postmortem.[6] Subsequent similar events have been reported in the literature. Wang *et al*.[5] presented a case series detailing nine instances of carotid artery rupture following foreign body ingestion. Patients sought emergency care between 4 and 28 days after ingesting the foreign object, exhibiting common clinical features such as odynophagia, diffuse neck swelling, hematemesis, dysphagia, pulsatile swelling, and fever. All cases were managed via open surgical procedures under general anesthesia. Remarkably, no reported cases of superior thyroid artery injury due to foreign body ingestion have been identified in the available literature. However, Gates *et al*.[7] documented a case wherein superior

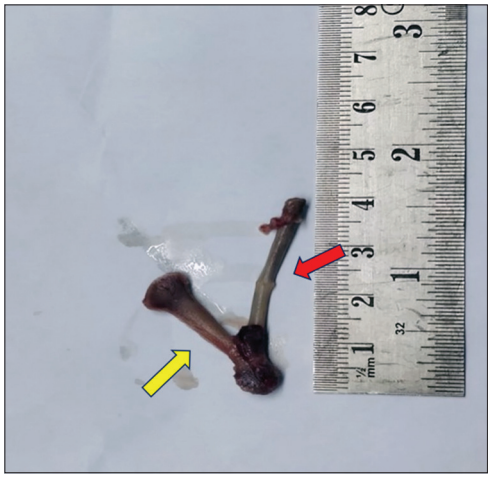

Figure 2: V-shaped foreign body (chicken bone) with short segment (yellow arrow) and long segment (red arrow)

thyroid artery bleeding followed fine-needle aspiration cytology performed on a thyroid swelling.

The preferred initial investigation for fish or chicken bone ingestion is typically an X-ray, specifically a plain lateral neck X-ray or a CT neck scan.[8,9] In cases where vascular injury is not suspected due to the foreign body being located in the hypopharynx and not having migrated, CT scans serve as an initial investigative tool. Multiplanar reconstruction of the original CT images can further aid in precisely locating the foreign body. Given the location of the foreign body in the hypopharynx, our primary plan was to conduct a rigid esophagoscopy-guided removal under general anesthesia. The choice of anesthesia for foreign body removal primarily hinges on the removal technique. General anesthesia becomes necessary when using rigid esophagoscopy for removal.[10,11] However, conscious sedation can suffice if the foreign body removal is attempted using flexible endoscopy.[11] For patients at a higher risk of aspiration or with a foreign body lodged in the proximal esophagus near the airway, securing the airway with an endotracheal tube is essential for safety during the procedure.[2]

Anesthetizing intellectually disabled patients poses significant challenges due to unreliable histories, communication barriers, and difficulties in eliciting cooperation during the preoperative phase.[12] Often, these individuals struggle with expressing themselves or providing comprehensive medical histories, especially regarding events like foreign body ingestion. The choice of induction method in such cases depends on factors like the availability of intravenous access and the level of patient cooperation. In instances where patients are uncooperative, considering intramuscular ketamine to help calm them down might be an option.[12]

The initial plan for inhalational induction was based on the foreign body's location near the tip of the epiglottis, close to the aryepiglottic fold, and the unique V-shaped nature of the foreign object, which could potentially obstruct the passage of an endotracheal tube. The intention was to maintain spontaneous breathing after inhalational induction and proceed with direct laryngoscopy to precisely locate the foreign body, considering muscle relaxants afterward if needed. However, during the inhalational induction, the patient experienced coughing and started bleeding from the oral cavity due to airway irritation. Consequently, the inhalational induction was discontinued, and the patient was positioned laterally for safety. Collaborating with the surgical team, an intravenous induction plan was initiated, given the significant oral bleeding and the risk of aspiration. To account for the potential difficulty in passing an endotracheal tube through the V-shaped foreign body, smaller-sized tubes were prepared for use. Additionally, a backup plan for tracheostomy was in place in case of any airway obstruction or complications during the procedure.

Vascular injuries resulting from foreign body ingestion typically necessitate surgical exploration and repair, with the initial management strategy tailored to the patient's clinical presentation. In cases of hemodynamic instability, prioritizing resuscitation before proceeding to the operating room is paramount, and securing the airway is imperative if the patient lacks consciousness to protect it.[2]

In this specific case, an abrupt onset of bleeding occurred without immediate signs of shock. Initial challenges in identifying the bleeding source were addressed through subsequent radiological evaluations, pinpointing the superior thyroid artery as the origin. Interventional radiology recommended embolization using polyvinyl alcohol particles, a frequently employed method for peripheral vascular embolization.

Endovascular embolization of the thyroid artery has proven effective in managing conditions like Graves' disease and goiter.[13,14] Previous reports have documented successful management of superior thyroid artery bleeding using embolization after fine-needle aspiration cytology of a thyroid swelling.[7] Other case series demonstrated thyroid artery embolization for thyroid nodules and Graves' disease, noting occurrences of cerebral infarction postembolization.[15] In our case, the patient exhibited neurological symptoms suggestive of cerebral infarction (left middle cerebral artery) 24 hours after embolization. Similar to reported cases, our patient responded positively to conservative medical management for this complication.

Managing anesthesia for an intellectually disabled patient with a superior thyroid artery injury from foreign body ingestion presents unique challenges. Tailoring care to the individual, involving multiple specialties, and emphasizing effective communication are crucial aspects of this patient's management.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

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