

Case Report

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Acute Onset Dysphagia: Using Awake Fiberoptic Techniques to Avoid an Airway Disaster

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Introduction

Clinically, foreign body ingestion and aspiration can be difficult to differentiate from one another. Distinguishing the nuances in clinical presentation is important. Misdiagnosis can lead to catastrophic outcomes. Objects in the aerodigestive tract can become easily dislodged and travel into the airway if the wrong therapeutic intervention is performed. A few necessary definitions will be elucidated below.

Ingestion is defined as taking in food, fluid or a foreign object into the alimentary tract. Signs of entrapped ingested foreign body include sensation of a foreign body, dysphagia, difficulty swallowing, inability to clear secretions, coughing, chest or abdominal pain and/or vomiting¹. Aspiration is defined as the misdirection of gastric contents or accidental swallowing of fluid, food or a foreign object into the respiratory tract which can cause serious pulmonary sequelae². Signs of aspiration include shortness of breath, wheezing, coughing and non-specific chest pain. Although these two processes have distinct physiologies, they commonly occur at the same time. They may also share symptoms and clinical presentation, which can be difficult to distinguish from one another. Accidental foreign body ingestion may lead to acute dysphagia which may be oropharyngeal or esophageal in location³.

Dysphagia is defined as difficulty in swallowing caused by abnormal interruption during the passage of liquid or solid bolus in the alimentary tract. Oropharyngeal dysphagia can be attributed to mistiming and lack of oropharyngeal coordination with the food bolus in transit ultimately leading to improper passage of the food as well as aspiration⁴. These swallowing deficits are supraglottic in location. It can be either neural or muscular in origin. On the other hand, esophageal dysphagia is commonly due to fibrotic changes or luminal narrowing of the esophagus and sometimes dysmotility⁵. Accidental foreign body ingestion and aspiration can occur simultaneously in adults. Risk factors include advanced age, developmental delays, sedation, encephalopathy, neuromuscular impairment, and psychiatric disorders⁶⁻⁹. Foreign body ingestion with delayed obstruction occurs more commonly with pathological changes in the gastrointestinal tract. These changes include strictures (about 37%), malignancy (about 10%), esophageal rings (about 6%) and achalasia (about 2%)¹⁰. The most common location of entrapment is due to physiologic narrowing of the upper, middle, and lower esophageal sphincters¹¹. Primary sites of obstruction depend on age, with adults being 68% in the lower esophageal sphincter and children with 78% in the upper esophageal sphincter at the level of the cricopharyngeal muscle¹¹.

Complications of entrapment include pressure necrosis, perforation with mediastinitis or peritonitis¹¹⁻¹³. Entrapment can be complicated by dislodgement of the object during retching, emesis, or iatrogenically with instrumentation during therapeutic intervention¹⁴⁻¹⁵. This dislodgement may result in aspiration of the foreign body resulting in desaturation and potential cardiopulmonary arrest.

In 80% of the cases, ingested foreign bodies are passed naturally while the other 20% require endoscopic intervention by a gastroenterologist. In less than 1% of cases, surgical intervention is required to retrieve the object^{3,10}. Conversely, identification and treatment for the aspiration of a foreign body, is either with flexible fiberoptic bronchoscopy or rigid bronchoscopy performed by a pulmonologist^{1,16}. Below, we will describe how an understanding of the aforementioned pathophysiologies aided in the workup of acute dysphagia by anesthesia providers.

Case

Our patient is a 56-year-old female with uncontrolled type 2 diabetes, probable psychiatric history and homelessness who presents with a 3-day history of acute right upper quadrant and epigastric abdominal pain. Ultrasound (US) and computed tomography (CT) of the abdomen and pelvis showed evidence for acute cholecystitis. The patient was then taken in for laparoscopic cholecystectomy the following day. The patient's dental exam consisted of partial dentures of the two upper central incisors which were removed prior to induction. Intubation was performed by direct laryngoscopy using a Macintosh 3 blade and was atraumatic. She was then intubated for a total of 124 minutes before extubation. At approximately 22:00 that night, she developed acute onset dysphagia describing sensations of an object in the back of her throat and developed copious oral secretions that she was unable to clear. The patient reported swallowing the partial dentures upon sipping orange juice while in her room. She notified her nurse of this incident and the primary team was informed. In light of her uncertain psychiatric history, the astute surgical team pushed for further evaluation to avoid dismissing her symptoms as psychogenic.

Given her clinical presentation, entrapped ingested foreign body was high on the differential. There was however, concern from the surgical team, that endoscopic evaluation may dislodge the dentures into the glottic opening if their true position was not in the esophagus. In an effort to rule out foreign object obstruction of the airway, the surgical team was hopeful for an evaluation prior to proceeding with esophageal endoscopic examination. Due to the unavailability of a pulmonologist on duty at our facility, anesthesiology was consulted for the aforementioned evaluation.

At the time of evaluation, the anesthesia team requested imaging. This request was made with the understanding

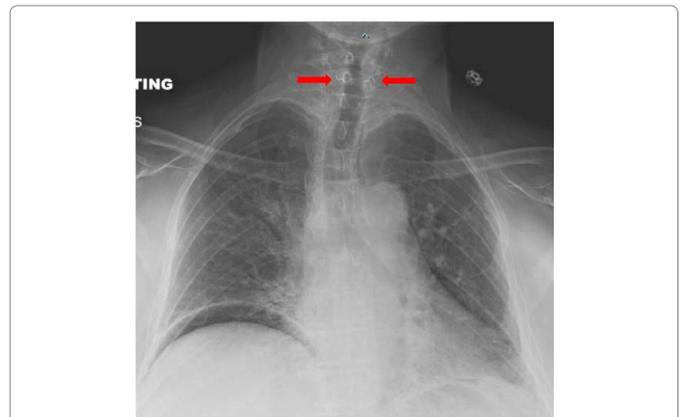


Figure 1: Wire like foreign body seen on plain radiography indicated by red arrows.

that wire attachments found in partial dentures may appear on radiography. Initially, the imaging read was negative; however, an opaque wire-like foreign body was identified upon anesthesiology review. Based on the radiologic imaging as seen in figure 1, the object could be either in the upper esophagus, supraglottic or infraglottic area. With the skill set anesthesiologists possess in awake fiberoptic intubations and the lack of a pulmonologist on duty, the anesthesia team further investigated if the object was supraglottic.

On presentation to the operating room, the patient was retching, endorsing nausea, and drooling, unable to handle her secretions. In preparation for fiberoptic examination, a cricothyrotomy kit, tracheostomy tray and a general surgeon was made readily available prior to proceeding. The patient's oropharynx was anesthetized with nebulized 4% lidocaine that was mixed with phenylephrine to reduce edema and increase patency. Pledgets soaked with 4% lidocaine and phenylephrine were then placed on the tonsillar pillars to anesthetize the glossopharyngeal nerve. The hypopharynx and supraglottic larynx, which is innervated by the internal branch of the superior laryngeal nerve was then anesthetized by gargling 4% lidocaine for one minute. Lastly, the vocal cords, subglottic larynx and trachea which are innervated by the recurrent laryngeal nerve were anesthetized under direct visualization with the use of the fiberoptic injection port site with additional 4% lidocaine. Ambu® aScope™ 4 Broncho regular size 5.00mm/2.2mm was utilized with awake oral fiberoptic technique.

Visualization of the supraglottic airway can be seen in figure 2 and 3. Figure 3 shows the immediate infraglottic area with no foreign object visible. Not shown: fiberoptic exam of the trachea, right and left main bronchi, and distal airways revealed no foreign object. At this time, foreign body was ruled out in all three locations including: supraglottic, tracheal and bronchial. Given a clean evaluation of the airway for her source of dysphagia, gastroenterology was

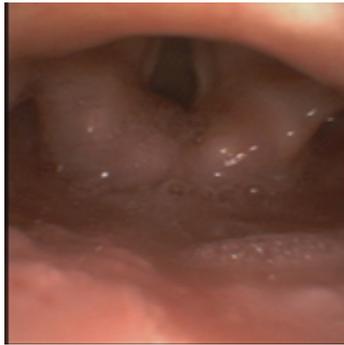


Figure 2: View of the supraglottic area with the cuneiform tubercle posteriorly, epiglottis anteriorly and the vocal cords distally.



Figure 3: Close up of the vocal cords and ventricular folds. No foreign object can be seen in the supraglottic or infraglottic region.

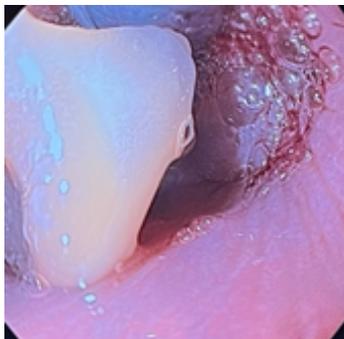


Figure 4: Partial dentures in the upper esophagus.



Figure 5: Partial dentures removed from esophagus measuring at 3-cm by 2.2-cm.

then consulted for an esophagogastroduodenoscopy (EGD) for further workup involving the alimentary tract. As seen in figure 4, the partial dentures were in the upper esophagus. The object was easily extracted using 8-inch Magill forceps. Figure 5 shows the partial dentures that were extracted measured at 3-cm by 2.2-cm. Following the procedure, the patient reported resolution of her dysphagia symptoms and was able to handle her secretions without discomfort. The patient had no secondary sequelae from the foreign object being entrapped.

Discussion

Ingestion of a foreign body can negatively impact an individual's quality of life and nutritional status¹¹⁻¹³. As Brian Huang and colleagues described, health care costs related to the workup of foreign body ingestion can be very costly. At times, the estimated total health care cost for an ingested foreign body can exceed \$45,000 USD per patient¹⁷. Workup can be aided by clinical swallowing evaluations, imaging, and invasive procedures. Finding the correct diagnosis requires reviewing medical documentation and a thorough history and physical examination as well as having the appropriate specialists to aid in the workup.

In addition to gastroenterologists being a part of the dysphagia workup, pulmonologists can also be just as crucial in the work up of this diagnosis. The central valley of California unfortunately has a scarcity of specialties; pulmonology being one of them. A geographic distribution showed one pulmonologist was only available 38.3% of the time within a 10-mile radius compared to 100% of the time in urbanized areas¹⁸. This can put immense strain on already overburdened healthcare systems by transferring patients out for seemingly simple procedures. One of the advantages of being in a rural and smaller hospital is the relationship that is built between providers of different specialties. The primary surgical team was familiar with the skill set that the anesthesiology department had concerning awake fiberoptic techniques, which allowed them to stand in for pulmonology in our situation. The anesthesiologist was successful in ruling out the object being supraglottic. Gastroenterology was then able to extract the object safely without the risk of introducing the foreign object into the trachea.

Based on the patient's acute dysphagia and use of partial dentures, the most likely explanation was aspiration or entrapped foreign object in the alimentary tract. Plain radiograph did reveal a foreign object consistent with her symptoms. Her possible history of mental health issues prompted the surgical team to seek full evaluation. Commonly, this patient population is dismissed for having symptoms that may or may not be real. In addition, those with complex mental health comorbidities also encounter unique characteristics that put them at risk for dysphagia.

Firstly, patients with mental health disorders are at risk for dysphagia due to functional somatic disorder or phagophobia¹⁹. Simply put, somatic symptom disorder is a disruption of the normal processes of the body that are not due to structural disease. Secondly, medications that are commonly used to treat mental illness such as antipsychotics can also induce dysphagia. Antipsychotics may induce oropharyngeal dysphagia by inhibiting dopaminergic pathways which causes extrapyramidal motor disorders and dyskinesias²⁰. Other than medications, adults with mental health illness were 43 times more likely to die from choking asphyxiation. Dysphagia is prevalent in mental health illness due to changes in behavior, coexisting neurological disorders and the possible effects of institutionalization²¹.

As Alex Mitchell and colleagues noted, patients with psychiatric and medical illness have increased functional and occupational disability, increased mortality and poorer quality of life when compared to those without mental illness²². There is also evidence to show those with psychiatric illness or a substance use disorder experience less medical workup²². Often, psychiatric comorbidity can overshadow presenting complaints and lead to healthcare biases that bolster misdiagnosis²³. Oliver Lord and colleagues showed patients with mental health diagnoses were less likely to receive recommended screening services²³. Likewise, homeless patients are also treated similarly, and receive discriminatory treatment²⁴. Careful and thorough review of her history and symptoms enabled further workup of her acute dysphagia and ultimately diagnosing foreign body ingestion.

The standard of care in retrieving foreign body ingestion includes the use of laryngoscopy, endoscopy, flexible and rigid bronchoscopy^{1,16}. All of these techniques require the patient to be under sedation or general anesthesia, both carrying risks. Awake fiberoptic techniques allow for the patient to be breathing spontaneously and comfortably without the risks associated with general anesthesia. Placing an endotracheal tube in the setting of an undiagnosed supraglottic foreign object may complicate an airway by dislodging the object into the airway.

In this case presentation, we illustrate that within the armamentarium anesthesiologists possess, they have the skills, tools, and understanding of oral, pharyngeal, laryngeal and tracheal anatomy to safely investigate foreign bodies within the aerodigestive tract. Using familiar techniques such as awake fiberoptic examination, anesthesiologists can avoid general anesthesia and reduce the burden on medical professionals which are already scarce in rural and underserved areas. The transfer rate for patients living in rural areas is almost double at 9.8% compared to 4.8% in patients living in non-rural areas when certain specialties or resources are not available²⁵. By

maintaining competency in certain techniques, we can avoid these frequent transfers to overburdened urban hospital settings. Where pulmonologists are not readily available, and concern exists for dislodging potential supraglottic foreign bodies into the trachea, anesthesiologists may assist with the diagnosis of acute onset dysphagia when foreign body ingestion is suspected.

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