Perforating and migrating pharyngoesophageal foreign bodies: A series of 5 patients

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Abstract
Ingestion of a foreign body is a problem seen in nearly all otolaryngologic practices. One of the least common complications of foreign-body ingestion is penetration and migration, which may lead to serious morbidity or even death. We report the findings of a retrospective review of a series of 5 patients who had presented with a complete foreign-body penetration. All of them had radiologic evidence of a foreign body, but findings on rigid endoscopy were negative. Computed tomography is the radiologic study of choice to identify penetrating foreign bodies. The foreign bodies in all 5 patients were extracted via an external approach.

Introduction
Foreign bodies in the hypopharynx and cervical esophagus, particularly fish bones, are a common complaint in otolaryngologic practice. A swallowed foreign body can become embedded in the tonsil, base of the tongue, piriform fossae, or any area of the upper esophagus. Fortunately, the development of sophisticated investigations and instruments has allowed us to easily remove most of these foreign bodies by indirect or direct laryngoscopy. However, in some cases, sharp foreign bodies can penetrate the upper digestive tract and migrate into the soft tissues of the neck. It would be impossible to see or remove these foreign bodies by direct laryngoscopy. In such circumstances, serious complications can occur and expose the patient to a high degree of morbidity or even death, especially if the treating surgeon fails to recognize or anticipate such a cause.1,2

Prompt diagnosis is essential to the management of a perforating foreign body. The specific nature of symptoms, of course, is very helpful in localizing the site of the foreign body.3 A finding of a laceration, edema, or ulceration on direct laryngoscopy and esophagoscopy should raise the level of suspicion for a perforating foreign body. Some authors advocate laryngoscopic microscopy to visualize and remove a foreign body.4 X-ray is an important tool for localizing a perforating foreign body in the neck, but it can be misleading in cases where the cartilages of the upper airway are calcified. Computed tomography (CT) is considered to be the study of choice in such cases.

We conducted a retrospective review of all patients who had presented to the Department of Otolaryngology at Sabah Hospital in Kuwait City for treatment of foreign-body ingestion. We identified 5 cases of extraluminal migration of the foreign body and subsequent perforation of the upper aerodigestive tract (table).

Case reports
Patient 1. A 44-year-old woman presented to the Emergency Department 3 days after she had swallowed a foreign body. She complained of odynophagia while ingesting solid food but not fluids. She reported no fever, neck pain, swelling, or rigidity, and findings on the blood workup were normal. Lateral neck x-ray demonstrated a radiopaque shadow at the level of the hypopharynx. Endoscopic examination of the hypopharynx and esophagus failed to detect any foreign body. CT of the neck identified the foreign body in the left extrapharyngeal area (figure 1, A). Lateral neck exploration revealed that the body, a fish bone, was located in the soft tissues of the neck and that it had completely penetrated the hypopharyngeal muscles. The bone was extracted (figure 1, B and C), and the wound was irrigated with copious antibiotics. The patient was kept on intravenous antibiotics, and she recovered uneventfully.

Patient 2. A 37-year-old man was admitted to the hospital with a 5-day history of odynophagia after he had eaten fish. On examination, he was feverish and exhibited neck...
swelling on the right side. Findings on the blood workup were normal except for leukocytosis ([WBC]: 16.9 × 10^9/L). A lateral neck x-ray demonstrated a neck opacity. On endoscopic examination with general anesthesia, no foreign body was found in the lumen of the hypopharynx and esophagus. Despite IV antibiotic therapy, the patient remained symptomatic, and CT of the neck was obtained. CT identified a foreign body in the right extrapharyngeal tissue, as well as a neck abscess (figure 2). Lateral neck exploration was performed, and a fish bone was found and removed. The area of the abscess was drained, and a Penrose drain was left in place for a few days. The postoperative period was unremarkable, and the patient was discharged.

Patient 3. A 28-year-old woman initially presented to the Emergency Department complaining that she had experienced a severe and sudden pain in the neck while eating dinner. A lateral x-ray of the soft tissue of the neck was negative, and the patient was discharged on an oral antibiotic. Two days later, she returned to the Emergency Department and reported worsening of the neck pain and the onset of blood-stained saliva. Physical examination revealed that the right side of the neck was swollen and tender. Repeat soft-tissue x-ray of the neck detected a foreign body in the retrocricoid area at the level of C6. A reexamination of the initial radiograph obtained 2 days earlier revealed that the foreign body was indeed visible on the film. The patient was admitted with a temperature of 38.7°C, a [WBC] of 8.2 × 10^9/L, and an abnormal differential count. Esophagoscopy was unable to locate the foreign body in the hypopharynx, but contrast-enhanced CT of the neck revealed that the foreign body was embedded in the right lobe of the thyroid. CT showed that the lobe was enlarged and that an inhomogenous hypodensity was present around the foreign body. This finding was consistent with an inflammatory response or, more likely in this case, an abscess formation. A neck exploration and partial right thyroid lobectomy were performed. The foreign body, which had become embedded in the thyroid substance, was found to be a sharp, serrated fish bone. The patient made an uneventful recovery. Pathologic examination of the resected lobe confirmed that an abscess had formed around the fish bone and led to the development of associated thyroiditis.

Patient 4. A 23-year-old woman was admitted on an emergency basis because of severe neck pain, which had developed a few hours earlier after a meal of chicken and rice. Physical and hematologic findings on admission were normal. Anteroposterior and lateral soft-tissue radiographs detected a linear foreign body at the level of C6. On the anteroposterior film, the foreign body was horizontal and displaced from the midline, suggesting an extraluminal position. Esophagoscopy was negative. Contrast-enhanced CT located the foreign body in the left paraesophageal space. CT also identified an opacity posterior to the left lobe, the trachea, and the anterior wall of the esophagus; this finding probably represented a foreign-body reaction and infection. During lateral neck exploration, a small perforation of the posterior wall of the esophagus was discovered, and a 4-cm piece of steel wire was removed from the left paraesophageal space. The wire was of the type that is used to close a bag of bread. The patient had apparently swallowed the wire somehow while opening the bag. Her recovery was uneventful.

Patient 5. A 53-year-old woman presented to the Emergency Department with a 4-day history of anterior chest pain, back pain, and mild dyspnea. The patient was afebrile. Chest x-ray showed a widening of the mediastinum. Findings on the blood workup were normal with the exception of leukocytosis ([WBC]: 14.0 × 10^9/L). Rigid endoscopy did not detect a foreign body, but it did identify a posterior esophageal tear 23 cm from the incisors. CT of
the chest demonstrated a radiodense foreign body in the retroesophageal area at the level of the carina intra- and extraluminally. The patient underwent a thoracotomy, and the foreign body was identified as a sharp-edged chicken bone. The bone was removed, the esophageal tear was repaired, and a drain was inserted. The patient was admitted to the intensive care unit for a few days and released.

Discussion

Impaction of foreign bodies in the upper aerodigestive tract has been reported since early in recorded history.\(^5\) Foreign bodies can become lodged in the tonsil, base of the tongue, piriform fossa, and cervical esophagus. Therefore, the nature of the impaction can range from simple to life-threatening.\(^1,2\)

Only rarely do foreign bodies penetrate the wall of the aerodigestive tract, and even more rarely do they migrate into the soft tissue and viscera of the neck. The sharper the foreign body is, the higher the risk of penetration. The risk of penetration is also influenced by the foreign body’s orientation; horizontally oriented foreign bodies are more likely to penetrate. When perforation occurs, it is facilitated by the strong contraction of the hypopharyngeal and cricoesophageal muscles as they propel a food bolus into the esophagus; this explains why higher rates of penetration occur in the hypopharynx and cervical esophagus. The duration of impaction may not have a strong influence on the risk of penetration.\(^6\) Indeed, a patient in our series (patient 4) experienced penetration only a few hours after ingesting the foreign body.

Perforating and migrating foreign bodies can introduce bacteria into the soft tissue of the neck and cause suppurative complications such as para- or retropharyngeal abscess (as occurred in our patient 2). Infection can spread into the mediastinum and lead to life-threatening mediastinitis. A foreign body might also penetrate adjacent visceral structures such as the thyroid gland (as occurred in our patient 3). Finally, these objects can also penetrate...
the major blood vessels in the neck and precipitate vascular complications such as aortoesophageal and innominate-esophageal fistulae and carotid rupture.²

Patients with penetrating foreign bodies may be asymptomatic initially, but most eventually present with a foreign-body sensation, a sharp pricking sensation on swallowing, odynophagia, and/or hemoptysis. Suppurative complications accompanying a perforation might produce fever and neck swelling. An increased WBC should raise suspicion.

One of the most common tools used to identify foreign bodies is the lateral neck x-ray. Pathology can be presumed when plain films reveal (1) a foreign body, (2) associated soft-tissue swelling, (3) abnormal gas accumulation in the soft tissue of the neck, (4) and/or a loss of cervical lordosis.³ However, not all fish bones are radiopaque. In fact, one study showed that lateral neck films had a sensitivity of only 25%, and a specificity of 86.3%, for detecting fish bones.⁴ The reliability of lateral neck x-rays is also diminished by the presence of calcified airway cartilage (e.g., the thyroid and cricoid cartilage). Calcification of the cricoid cartilage can occur in the ridge of the posterior lamina; on lateral neck x-rays, it can appear as a linear opacity separated from the rest of the cricoid calcification and mimic a foreign-body impaction in the postcricoid area.⁵ ⁶ Finally, lateral neck x-rays lack the capability to pinpoint the exact location of a foreign body and to determine whether migration has occurred.⁶

Whenever the clinical picture (i.e., findings on the history, physical examination, and lateral neck x-ray) suggests an impacted foreign body, the patient should undergo direct laryngoscopy and rigid esophagoscopy under general anesthesia (figure 3). Certain endoscopic findings—ulceration, edema, and laceration—should arouse suspicion of a perforation. The vast majority of foreign bodies are intraluminal and can be easily extracted. But when a foreign body cannot be located endoscopically despite its identification on plain x-ray—especially in the presence of toxic symptoms such as high fever, neck swelling, and/or an elevated WBC—further investigation is warranted. In all 5 of the cases described herein, rigid endoscopy failed to effect the extraction of the foreign body despite its identification on x-ray. CT is simple and fast, and it can detect the precise location of an extraluminal foreign body. In addition, it can also help in localizing a foreign body in the soft tissue and in relation to vital structures in the neck.

References