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CASE REPORT

Transluminal Migration of Oesophageal Foreign Bodies: A Series of Three Patients

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ABSTRACT

Inadvertent ingestion of foreign bodies, particularly fish bone, are a common complaint in the otolaryngology emergency practices in Southeast Asia. Due to its thin, linear, and sharp pointed end, fish bone has the potential to penetrate through the oesophagus wall, or migrate extraluminally towards the surrounding structures in the neck, resulting in bizarre and lethal complications. We present an unusual case of extraluminal migration of foreign body (FB) and 2 cases of completely embedded FB in the oesophagus wall. We aim to share our experience in both conservative approach and transcervical approach for these difficult clinical problems. All of them have minimal rigid oesophagoscopy findings but possess the radiological evidence of FB. Computed tomography scan have higher sensitivity and provide good preoperative guidance, it should be done early and performed in the event of negative endoscopic evaluation. Prompt diagnosis and early retrieval of FB can significantly reduce morbidity and mortality.

KEYWORDS: Migration, foreign bodies, penetration, thyroid gland

INTRODUCTION

Inadvertent ingestion of foreign bodies is a common complaint in the casualty and outpatient otorhinolaryngology (ORL) clinic. This frequently happen in the Southeast Asia population, due to the habit of consuming unfilleted fish followed by separation of fish bone from the fish meat in the oral cavity [1]. Fortunately, most of the swallowed foreign body (FB) easily pass through alimentary tract without causing any problems. Amongst the retained FB in adult oesophagus, fish bone contributes to 60% of all cases, followed by chicken bone (16%) [2]. This can be explained by the nature of fish bone, which are slim, lack rigidity and hardly seen when it is mixed with rice or other food. The most frequent sites of FB impaction are palatine tonsils, tongue base, vallecula, pyriform fossae and cricopharyngeus [3]. Due to its thin, linear, and sharp pointed end, fish bone has the potential to penetrate through the oesophageal wall, or migrate extraluminally towards the surrounding structures in the neck, resulting in bizarre and lethal complications [4]. The incidence of oesophagus penetration by FB is rare, which range between 1 to 4% [5]. Interestingly enough, cases reporting migratory FB into the thyroid gland are even rarer [6].

CASE PRESENTATION

i) Case 1

A 65-year-old lady presented to emergency department at 4 hours after she had unintentionally ingested a shark fish bone during her meal. She complained of increasing odynophagia and dysphagia. She claimed the pain was sudden in onset and prickling, and she was unable to swallow any food or drinks. During examination, no FB was found in oral cavity. Flexible laryngoscopy showed

oedematous and erythematous mucosa over bilateral arytenoid region with pooling of saliva, with no visible FB. Lateral neck radiograph demonstrated a radiopaque oblique line at the level of fifth and sixth cervical vertebrae (Figure 1).

Figure 1 Lateral neck radiograph demonstrated a radiopaque oblique line FB at the level of C5-C6 vertebrae

An emergency direct laryngoscopy and rigid oesophagocopy under general anesthesia was performed. Ulcer was seen over the posterior wall of cricopharynx, the upper oesophagus, with circumferential oedema intraluminally (Figure 2). Intraoperatively, biopsy forceps were used to explore the ulceration site, but failed to identify any FB. Urgent computed tomography (CT) neck revealed a linear hyperdense FB (2.3 cm) in length seen piercing through the left wall of upper cervical oesophagus and extended inferolaterally with its tip in the left thyroid lobe (Figure 3).

Exploration under anesthesia was performed. A horizontal incision over the anterior neck was made after the consideration of the nearer distance to the FB. The neck exploration showed a sharp linear fish bone embedding in the left posterior superior thyroid lobe with its tip pierced toward the anterior aspect of thyroid gland (Figure 4). The fish bone was carefully extracted and wound was closed. The fish bone measured 2.3 cm long (Figure 5). Patient was administered with intravenous cefuroxime and metronidazole for 4 days and discharge well with continuation of oral antibiotics. Her postoperative course was uneventful.

Figure 2 Rigid oesophagoscopy showed 2 small ulcerative lesions over the posterior wall of cervical oesophagus 15 cm from the upper incisor with circumferential intraluminal oedema

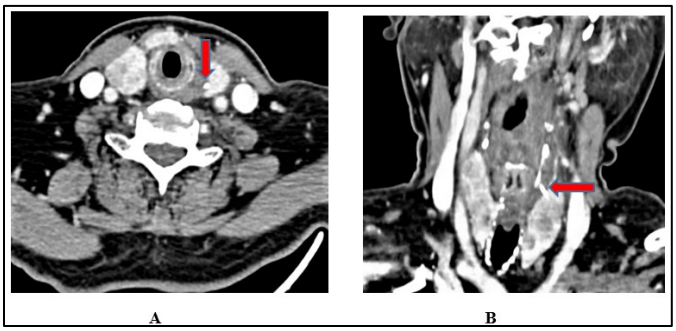

Figure 3 CT neck revealed a linear hyperdense FB (2.3 cm) in length seen piercing through the left wall of upper cervical oesophagus and extended inferolaterally with its tip in the left thyroid lobe as visualized in axial (A) and coronal view (B).

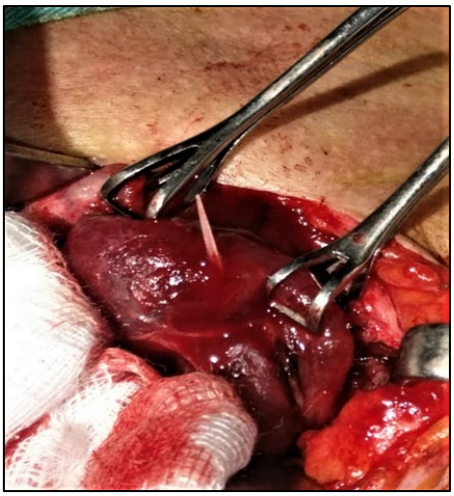

Figure 4 Neck exploration showed a sharp linear FB embedding in the left posterior superior thyroid lobe with its tip pierced toward the anterior aspect of thyroid gland

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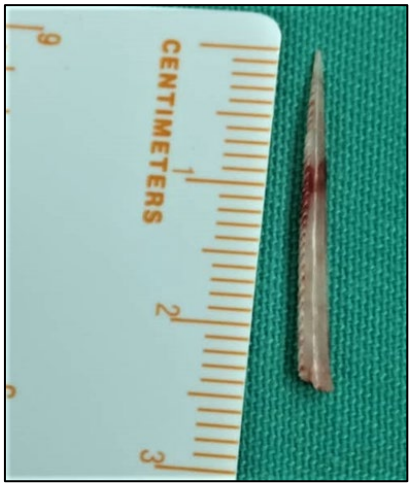

Figure 5 The extracted fish bone, which was 2.3 cm in length

ii) Case 2

A 40-year-old lady presented to ORL clinic with one-day history of sharp prickling throat pain and dysphagia after she had eaten fish. She denied fever, neck swelling, or noisy breathing. A lateral neck radiograph noted loss of cervical lordosis but no air trapping or FB seen. Despite thorough search with flexible laryngoscopy, no FB was found. As the pain persist with oedema over the right arytenoid and pooling of saliva, she was scheduled for urgent CT neck. The CT demonstrated a linear hyperdense FB at the midline of the posterior wall of hypopharynx, and it measured 2.2 cm in length (Figure 6). Despite thorough search using rigid oesophagocopy and attempted incision and exploration over affected arytenoid region, no FB was found. Patient refused transcervical retrieval of FB. Continuation of antibiotic and conservative treatment was afforded to her. Repeat CT neck in second week revealed the FB remained similar in location. Upon discharge, she was well and remained asymptomatic up to 10 months of follow up.

iii) Case 3

A 25-year-old lady was admitted with one-day history of odynophagia and FB sensation, which develop soon after she ingested a meal of chicken rice. Lateral neck radiograph revealed a suspicious FB at level of seventh cervical vertebra. No abnormal findings were found in the oral cavity or pharynx during the direct visualization assessment on flexible nasopharyngolaryngoscopy. Direct laryngoscopy and oesophagoscopy revealed multiple small ulceration spots with irregular surface over anterior wall oesophagus, 18 cm from upper incisor, but no FB seen. CT neck was performed, as patient still having odynophagia and the localization of FB still remain unclear. It showed a linear hyperdense FB (1.4 cm in length) at the anterior wall of oesophagus (Figure 7). Patient keen for watch and wait policy, refused for cervical incision and neck exploration. Administration of antibiotics was continued, and her symptoms was gradually disappeared. She was remained asymptomatic for past one-year during clinic review.

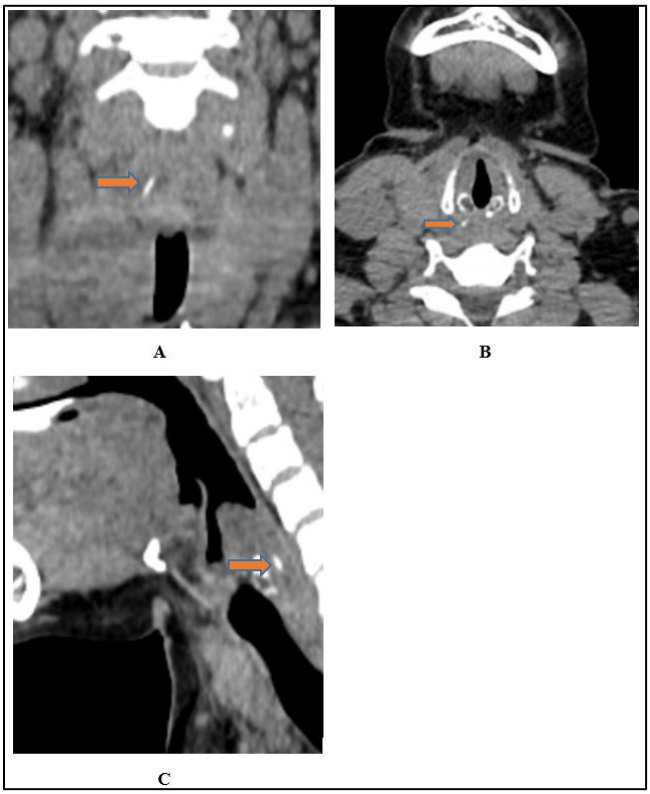

Figure 6 CT neck revealed a linear hyperdense FB in the posterior wall of hypopharynx, measuring 2.2 cm in length as visualized in axial (A), coronal (B) and sagittal view (C)

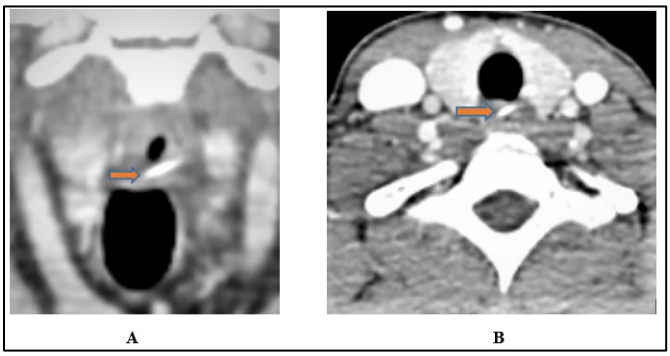

Figure 7 CT showed a linear hyperdense FB (1.4 cm in length) at the anterior wall of oesophagus as visualized in coronal (A) and axial view (B)

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DISCUSSION

Lateral neck radiograph is the simple and frequently used tools to identify ingested FB. According to Eliashar et al, FB should be considered if plain neck radiograph showed (a) the FB, (b) related soft tissue swelling, (c) gas shadow collection, (d) absent of cervical lordosis [7]. However, images of FB are sometime overlooked and mistaken for calcification of thyroid or cricoid cartilage [8]. Our Case 2 showed that not all FB can be visualized using plain neck radiograph and it is thus not reliable to detect FB. The decreased visibility of fish bone on radiograph maybe a consequence of a few factors, including the inherent radio-opacity of different species of fish bone, lodgment site, diameter and human laryngeal ossification [9, 10]. Moreover, it also could not help to determine the migration of FB and unable to pinpoint the precise location of a FB. Compared to plain neck radiography, CT scan able to detect FB in all 3 cases and thus more superior and reliable for diagnosing oesophagus FB impaction. It enables the surgeon to determine the exact location, orientation of FB, and more importantly, their relationship with the surrounding vital structure in neck, which also serve as the landmark in neck exploration [11].

In all the 3 cases, flexible and rigid endoscopy was less capable to locate the intramural and extraluminal FB despite its identification on CT scan. However, endoscopy assessment is always part of the examination and it helps to appreciate soft tissue injury example ulceration, edema and laceration that cannot be appreciated from imaging. These endoscopic features serve as an important key to alert the surgeon regarding the possibility of extraluminal migration of FB in the cases of absent FB in the oesophagus. Therefore, high index of clinical suspicion by the examining surgeon is the most important tool for early diagnosis and detection the perforating FB. During rigid oesophagoscopy, one study suggested using a biopsy forceps to explore the ulcerative spot in the hope of retrieving imbedded sharp FB [12]. In terms of neck exploration technique, after a transcervical incision, we approached the tracheoesophageal groove in the first place, then identified the recurrent laryngeal nerve and its groove before proceeding for neck exploration. By this method, it can minimize the risk of nerve injury. This technique has been reported by Lincoln et al in 1999 [11]. Ho et al discussed the retrieval of FB in hypopharynx and retropharyngeal space by using percutaneous extraction route through the left thyrohyoid membrane. A cervical puncture was made followed by advancing small hemostatic forceps under fluoroscopic guidance. However, the FB was break during extraction and a rigid pharyngolaryngoscope with a carbon dioxide laser was required to remove the residual intraluminal FB [12]. Interestingly, Wong et al reported a case of an open approach via a creation of lateral thyroid cartilage window in managing an embedded paraglottic FB. The perichondrium of thyroid cartilage was sutured after removing the FB [13]. Transluminal migration of a FB can lead to the difficulty to discover it intraoperatively, Lupo et al suggested the utilization of image intensifier or intraoperative ultrasonography can be very useful to guide the dissection process and facilitate the localization of embedded FB [14].

In one study of 273 patients with oesophageal FB, the complication rate and mortality rate was 7.3% and 0.73% respectively [15]. The complications are oesophageal perforation with perioesophagitis, perioesophageal abscess, mediastinitis, and vascular injury including innominate oesophageal fistula, aortoesophageal fistula and carotid rupture [16]. In Case 1, fortunately, the complication of mediastinitis, thyroid or deep neck abscess did not occur. After surgical removal of FB, intravenous antibiotic treatment was important to prevent secondary infection or sepsis complication.

Al Muhanna et al, reported the case of FB penetrating into thyroid gland. FB was found inside the thyroid lobe surrounded by inflammatory tissue following left hemithyroidectomy [17]. Foo, 1993 reported removal of FB via partial left thyroid lobectomy [18]. Both the authors did not describe the reason of lobectomy in details. In Case 1, without removal of the involved thyroid gland, identification and extraction of FB from the perforating thyroid gland was actually possible. Neck exploration maybe inevitable in the process of searching extraluminal FB, but thyroidectomy or lobectomy might not be necessary. With the administration of broad-spectrum

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intravenous antibiotics, patient Case 1 recovered well with no derangement of thyroid function.

According to study by Lam et al, non-operative intervention successfully treated 7 patients with penetrating FB without neck abscess and one patient with neck abscess and refused surgery [19]. Wu et al, also report that conservative approach was successful in some stable patients who had penetrating oesophageal FB without significant systemic features [20]. In Case 2 and 3, FB was found imbedded in oesophageal wall from CT scan but failed to be visualized via rigid oesophagoscopy. No transcervical retrieval of FB was done in both patients, but they remained asymptomatic up to one-year follow-up. However, conservative approach should be assessed meticulously and only applicable for patient who have no systemic signs, cervical or mediastinal abscess and patient who refused surgery.

The mechanism of migration of FB through the oesophagus mucosa into neck structures is unknown. The peristaltic movement in oesophagus with neck movement can contribute to the process [21]. The strong contraction of muscles involving hypopharynx and cricoesophageal region during food propulsion make these areas to have higher chances of FB perforation, and the duration of FB retention less likely contribute to the penetration process [11]. Undeniably, in Case 1, patient sustained oesophageal perforation and migration in a period less than 12 hours after ingesting FB. The risk of early oesophageal penetration is likely influenced by the factors including the sharp pointed FB, horizontally oriented FB, longer bone length, and its linear shape rather than other shapes that may halt it from the process of migration.

CONCLUSION

If the initial assessment with endoscopy and plain radiograph fail to identify the FB, this should not exclude their existence. CT should be done early and performed in the event of negative endoscopic evaluation. Not all ingested FB will remain intraluminally. A high index of suspicion especially when an endoscopy showed ulcerative lesion is needed to diagnose both intramural and extraluminal foreign bodies. Despite its rarity, FB penetration of oesophagus should not be missed as it can result in life threatening complication if the diagnosis is delayed. Prompt diagnosis and early retrieval of FB can significantly reduce morbidity and mortality.

Conflict of Interest

Authors declare none.

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Authors' contribution

Lim Iu Tong, Ong Fei Ming, and Viji Ramasamy drafted the article. Avatar Singh Mohan Singh and Irfan Mohamad were involved in the critical revision and final approval.

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