



Case series

Extraluminal migration of ingested fish bone in the upper aerodigestive tract: A series of three cases with broad clinical spectrum of manifestations and outcomes

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ABSTRACT

Introduction: Incidental fish bone ingestion may penetrate the upper aerodigestive tract and cause extraluminal migration due to late presentation or missed diagnosis. The migrated fish bone exhibits a wide spectrum of clinical manifestations, ranging from mild symptoms to potentially fatal complications.

Presentation of case: We report three cases of extraluminal fish bone migration with diverse clinical presentations and complications. The first patient had mild throat symptoms and a fish bone that travelled through the neck and migrated towards the subcutaneous tissue without causing complications. The second patient developed deep neck abscess and thoracic complications as a result of the migrated foreign body, but recovered after surgical exploration and foreign body removal. The third patient presented late in sepsis and upper airway obstruction, subsequently succumbed to multiorgan failure before any surgical intervention.

Discussion: Thorough physical and endoscopy examinations are essential in patients with fish bone ingestion. Normal endoscopic findings in a symptomatic patient should always raise the suspicion of a migrated fish bone. A radiographic imaging study is often helpful in locating the foreign body and potential complications. The migrated fish bone that acts as the source of infection in the neck should be traced and removed surgically. The resulting abscess, if present, must be drained. The management of a migrated fish bone can be challenging and often require multi-discipline collaboration.

Conclusion: The migration of the ingested fish bone outside the upper aerodigestive tract can cause serious complications and death in some cases. Clinicians should always maintain a high level of suspicion towards extraluminal migration in a patient with a history of fish bone ingestions but normal endoscopic findings. We emphasize the importance of early recognition and prompt surgical intervention to remove the migrated fish bone to minimise the potential morbidity and mortality.

1. Introduction

Foreign bodies in the upper aerodigestive tract are a common encounter in routine otorhinolaryngology practice [1]. One of the rare but dire complications of the ingestion of sharp or pointed foreign bodies such as a fish bone is the migration through the pharyngeal or oesophageal mucosa into the deep spaces of the neck or mediastinum. This may result in various complications such as neck abscess, mediastinitis, or major vessel puncture. The treatment of the migrated fish bone is

early surgical exploration and removal of the foreign body. However, locating the foreign body in the neck soft tissue with the surrounding inflammation can be very challenging. We present three retrospective cases of migrated fish bones in a single centre with different complications and the challenges faced during management. This case series has been reported in line with the SCARE criteria and PROCESS Guidelines 2020 [2,3].

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2. Case presentation

2.1. Case report 1

A 40-year-old female with underlying bronchial asthma presented with a pricking sensation in the throat for two days. The symptom appeared after she was eating a fish, but the throat pain was mild and she could still tolerate a normal solid diet. She visited the ENT clinic in the tertiary centre and examination of the oropharynx and hypopharynx using flexible nasolaryngoscope were unremarkable. There was no foreign body or sign of inflammation seen. Her throat symptoms subsequently resolved with conservative management. However, she revisited the ENT clinic one week later with a sharp pricking sensation at her right neck. Examination showed a sharp-pointed foreign body protrusion at the lateral side of the right neck subcutaneous tissue (Fig. 1). A skin incision was made under local anaesthesia and the fish bone was found and removed from the neck subcutaneous tissue without complication (Fig. 2).

2.2. Case report 2

A 29-year-old female presented with a ten-day history of dysphagia associated with fever and pain over the right neck. She gave a history of incidental fish bone ingestion prior to the onset of the throat symptoms. Examination showed a tender swelling over the right neck and loss of laryngeal crepitus. Flexible nasolaryngoscope revealed bulging of the posterior pharyngeal wall with pooling of saliva at hypopharynx obliterating both pyriform fossae. No foreign body could be visualised. Lateral neck x-ray revealed prevertebral soft tissue swelling with an air-fluid level at C5 to C7 cervical spine. Computed tomography (CT) scan of the neck showed prevertebral space abscess at C3 cervical spine to T2 thoracic spine level with posterior oesophageal wall perforation seen at C5 level. No foreign body was evident in the imaging. Transoral incision and drainage via direct laryngoscopy under general anaesthesia was performed, and 5 ml pus was evacuated from the posterior pharyngeal wall near the right pyriform fossa. However, the patient had persistent fever and her condition did not improve despite the drainage of the prevertebral abscess. A repeated CT neck and thorax revealed worsening of the mediastinal pus collection near the oesophageal perforation site with a needle shaped foreign body seen within the abscess (Figs. 3 and 4), which was not seen in the previous imaging. The patient was subsequently co-managed by the senior consultants of the upper gastrointestinal team and cardiothoracic team. After a multidisciplinary discussion, transthoracic drainage of mediastinal abscess via

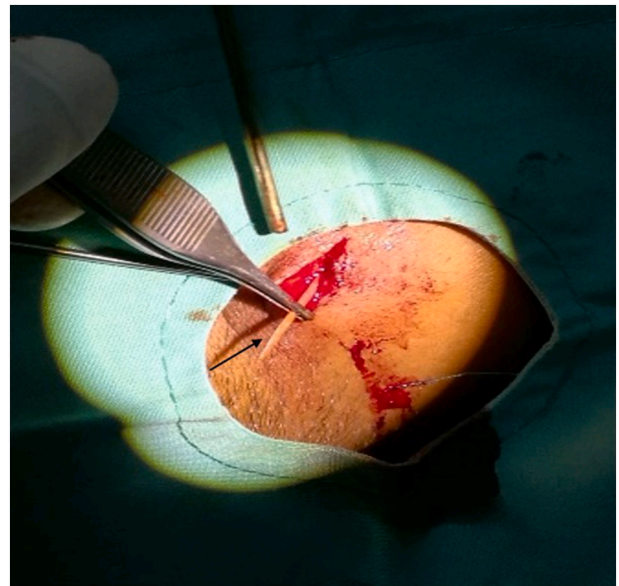


Fig. 2. The fish bone (arrow) was identified and removed under local anaesthesia.

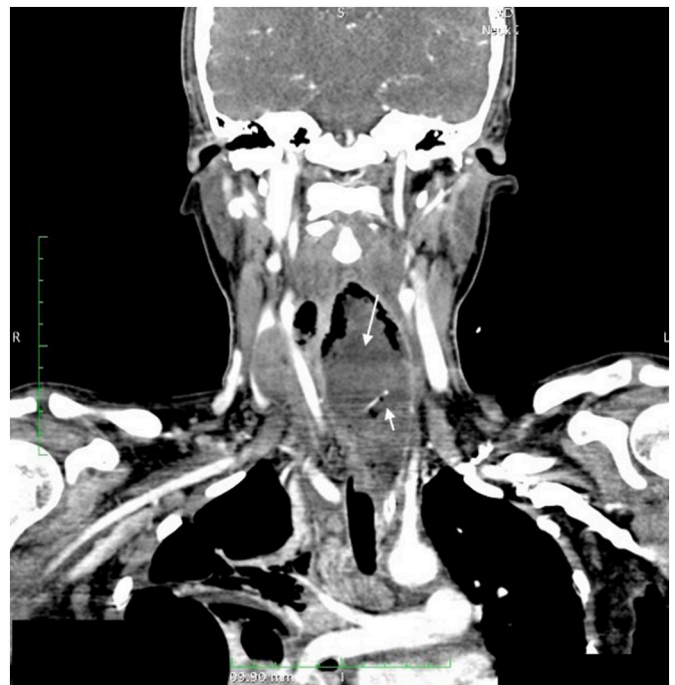


Fig. 3. The coronal CT scan of Case 2 shows the prevertebral abscess (long arrow) extending from the neck to anterior mediastinum with a linear hyperdense foreign body (short arrow) seen within the collection.



Fig. 1. The sharp protrusion at the neck of Case 1 due to the migrating fish bone underneath the skin (arrow).

thoracotomy was performed. It was found that the right paravertebral abscess had extended down into the thoracic cavity leading to right thoracic empyema. There was a small subcentimeter perforation at the posterior wall of the upper oesophagus directly connecting to the empyema, evident by flexible oesophagoscopy. The foreign body was found and removed but the attempt of suturing the oesophageal perforation was abandoned due to the difficult surgical site access and the surrounding intense tissue inflammation. After the drainage of the abscess and empyema, the patient was treated with a six weeks course of intravenous antibiotics in total due to the extensive infection before she was discharged home. The oesophageal perforation that was managed

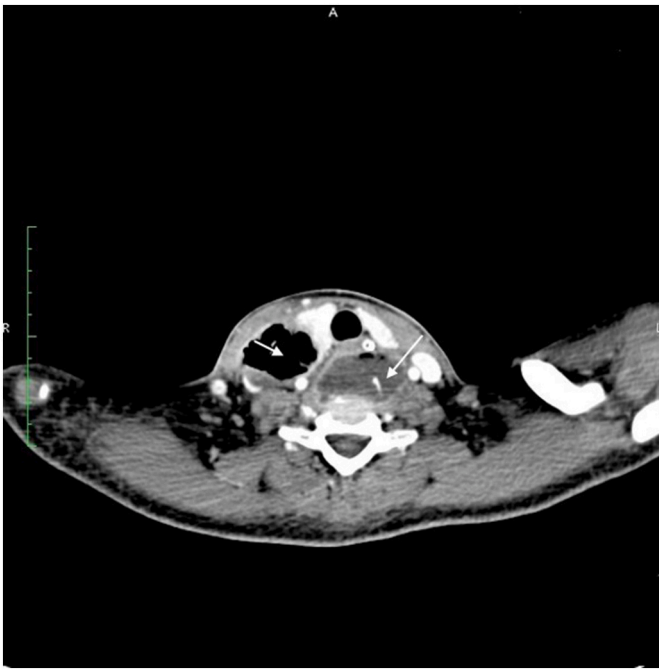


Fig. 4. Axial CT scan of the neck shows the prevertebral abscess with a foreign body (long arrow) within the collection, at the level of the thyroid gland; air pocket is seen at the right anterior neck (short arrow).

conservatively had subsequently healed, with no evidence of fistula formation.

2.3. Case report 3

A 47-year-old male presented to the emergency department with breathing difficulty and fever. He gave a history of fish bone ingestion four days prior and subsequent sore throat but did not seek medical attention. On arrival, he was in respiratory distress with an inspiratory stridor, appeared lethargic, and had drooling of saliva. There was a generalized neck swelling with subcutaneous crepitus felt but the overlying skin did not appear inflamed. The attending emergency physician secured the airway immediately through endotracheal intubation with rapid sequence induction. Further assessment with a flexible nasolaryngoscope revealed generalized edematous supraglottic structures. No foreign body could be visualised. A thickened prevertebral soft tissue with extensive air collections at the parapharyngeal spaces was noticed in the CT scan, suggesting a possible hollow viscus perforation (Fig. 5). There was a linear hyper-dense lesion seen at the right paratracheal region at the T1 level suspicious of a foreign body (Fig. 6). Flexible oesophagoscopy was performed but found no oesophageal wall perforation. The patient was nursed in the intensive care unit due to severe septicaemia with unstable hemodynamics. His condition further deteriorated and developed multiorgan failures. He unfortunately succumbed to the illness on the second day of admission, before any surgical intervention.

3. Discussion

Incidental fish bone ingestion is a common presentation to the emergency department and otorhinolaryngology clinic in Asian countries [1]. A majority (69%) of the ingested foreign bodies were impacted in the oropharynx and hypopharynx, namely at the tonsil, vallecula, the base of tongue, or pyriform fossa [4]. Sharp and linear foreign bodies such as a fish bone have a higher chance of penetrating the mucosa of the aerodigestive tract [5]. The presence of soft tissue inflammation and oedema surrounding the foreign body puncture site may obscure the



Fig. 5. Coronal CT scan of Case 3 shows extensive emphysema (arrow) at the parapharyngeal and prevertebral spaces.



Fig. 6. Coronal CT scan of the neck shows a linear hyperdense foreign body (arrow) at the right superior mediastinum at T1 level.

visualisation of the foreign body during endoscopic examination. Repeated contraction of the pharyngeal muscle and oesophageal peristalsis is among the factors that cause the foreign body to pierce through the mucosa and subsequent extraluminal migration [6].

Most of the patients (75%) seek treatment within 24 h of fish bone ingestion [7]. However, the patients in our series generally presented to us rather late, ranging 2 to 10 days after fish bone ingestion. The presenting symptoms vary significantly, from asymptomatic in Case 1, mild throat symptoms and neck swelling in Case 2, to respiratory distress and upper airway obstruction in Case 3. The lesson learned is that the clinician should always keep a high index of suspicion for extraluminal fish bone migration in patients with a history of incidental fish bone ingestion, especially when the endoscopy examination was normal. The

surrounding tissue oedema and pooling of saliva may mask the fish bone that was embedded in the pharynx. In certain circumstances such as Case 1, the endoscopic examination may appear normal with no significant sign of pharyngeal penetration or mucosal inflammation. The patient's throat symptoms improved when the fish bone had migrated extra-pharyngeal into the deep neck space before it reappeared externally underneath the skin. The fish bone had remarkably travelled through the neck without injuring major vessels or causing deep neck space infection.

The complications of the migrated fish bones vary depending on the site and path of migration in relation to the vital structures in the neck. Oesophageal perforation may occur as early as 24 h of fish bone ingestion and form abscess after 3 to 4 days [8]. The migrated fish bone may act as the source of infection leading to abscess formation especially in the parapharyngeal and retropharyngeal spaces. The presence of gas in the neck could be also due to infection by gas-forming organisms e.g. *Klebsiella*, anaerobic streptococci, *Clostridium*, and *Fusobacterium*. Loh et al. reported 7.3% of major complication rate in their series of 273 patients, mainly are oesophageal perforation, retropharyngeal abscess and mediastinitis. Only 6 patients required an open neck exploration to remove the migrated foreign body [9]. Penetration of migrated fish bone through the major blood vessels in the neck may lead to fatal complications such as aorto-oesophageal fistula or carotid rupture. However, it has been reported that fish bone that pierced through the common carotid artery and internal jugular vein can be removed safely without causing massive bleeding [10,11].

Lateral neck soft tissue X-ray is a quick and cheap tool to look for the presence of ingested fish bone, but the sensitivity is not high. Some fish bones may not be calcified enough to be visible radio-opaque in the radiograph, besides the presence of cervical spines and laryngeal cartilages that may be overlapping and obscure the view of the fish bone. It may be missed if the resolution of the film is low, and the viewer is not experienced to look for the slightest abnormalities in the film. Migrating fish bone into the neck soft tissue makes it more difficult to be seen in a plain radiograph. Computed tomography is, therefore, more superior and the gold standard imaging if a migrated fish bone is suspected. It can identify the exact anatomical location of the fishbone in the neck in relation to the vital structures such as the major blood vessels, besides looking for the presence of complications such as abscess formation.

The management of the extraluminal migration of fish bone with abscess formation is prompt surgical drainage of abscess and removal of the fish bone. The transcervical approach is superior to the transoral approach in terms of good surgical site exposure for soft tissue exploration and early identification of the vital vascular and neural structures. The open neck wound may also facilitate the subsequent bedside wound debridement and dressing. The occurrence of mediastinitis and sepsis from an oesophageal perforation was high, with a reported mortality rate of 10% [9]. A diverting cervical oesophagostomy is a surgical option generally reserved for persistent mediastinitis due to oesophageal perforation, which can reduce the mortality rate to 33–50% [12,13]. A multi-disciplinary management is warranted if the complication has involved the thorax and mediastinum to improve the patient's outcome.

4. Conclusion

The extraluminal migration of the ingested fish bone can potentially cause serious complications and death in certain cases. A normal endoscopy in a symptomatic patient must prompt the clinicians to suspect a migrated fish bone. Thorough clinical examination and investigations including endoscopy and CT imaging are essential to avoid delay in diagnosis and management. Through these case reports, we intend to highlight the broad clinical spectrum of extraluminal migration of fish bone in the upper aerodigestive tract. We emphasize the importance of early recognition and prompt surgical intervention to remove the migrated fish bone to avoid the potential life threatening complications.

Consent

Written informed consent was obtained from the patients and next of kin for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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CRediT authorship contribution statement

Wei Jie Koh: study concept and design, data collection, analysis and interpretation, writing the paper. **Syarifah Nafisah Al-Yahya:** study concept and design, analysis and interpretation, critical revision. **Sai Guan Lum:** study concept and design, analysis and interpretation, writing the paper, critical revision. **Jothi Shanmuganathan:** study concept and design, analysis and interpretation, critical revision.

Declaration of competing interest

None.

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References

- [1] L.W.J. Chee, D.S. Sethi, Diagnostic and therapeutic approach to migrating foreign bodies, *Ann. Otol. Rhinol. Laryngol.* 108 (2) (1999) 177–180, <https://doi.org/10.1177/000348949910800213>.
- [2] R.A. Agha, M.R. Borrelli, R. Farwana, K. Koshy, A. Fowler, D.P. Orgill, For the SCARE Group, The SCARE 2018 statement: updating consensus Surgical CARE REport (SCARE) guidelines, *International Journal of Surgery* 60 (2018) 132–136.
- [3] R.A. Agha, C. Sohrabi, G. Mathew, T. Franchi, A. Kerwan, N. O'Neill, for the PROCESS Group, The PROCESS 2020 guideline: updating consensus preferred reporting of case series in Surgery (PROCESS) guidelines, *International Journal of Surgery* 84 (2020) 231–235.
- [4] J.P. Kim, O.J. Kwon, H.S. Shim, R.B. Kim, J.H. Kim, S.H. Woo, Analysis of clinical feature and Management of Fish Bone Ingestion of upper gastrointestinal tract, *Clin. Exp. Otorhinolaryngol.* 8 (3) (2015) 261, <https://doi.org/10.3342/ceo.2015.8.3.261>.
- [5] A.O.M. Salting, Not just another sore throat: extraluminal migration of foreign body from the hypopharynx—a case report, *SAGE Open Med. Case Rep.* 6 (2018), <https://doi.org/10.1177/2050313X18803533>, 2050313X18803533.
- [6] M. Shaariyah, H. Salina, B. Dipak, M. Majid, Migration of foreign body from postcricoid region to the subcutaneous tissue of the neck, *Ann. Saudi Med.* 30 (2010) 475–477, <https://doi.org/10.4103/0256-4947.70565>.
- [7] L.W. Chee, D.S. Sethi, Diagnostic and therapeutic approach to migrating foreign bodies, *Ann. Otol. Rhinol. Laryngol.* 108 (1999) 177–180.
- [8] H.C.K. Lam, J.K.S. Woo, C.A. van Hasselt, Esophageal perforation and neck abscess from ingested foreign bodies: treatment and outcomes, *Ear Nose Throat J.* (2003;82 (10):786) 789–794.

- [9] K.S. Loh, L.K. Tan, J.D. Smith, K.H. Yeoh, F. Dong, Complications of foreign bodies in the esophagus, *Otolaryngol Head Neck Surg.* 123 (5) (2000 Nov) 613–616, <https://doi.org/10.1067/mhn.2000.110616>. PMID: 11077351.
- [10] I.P. Tang, S. Singh, N. Shoba, O. Rahmat, S. Shivalingam, K.G. Gopala, et al., Migrating foreign body into the common carotid artery and internal jugular vein—a rare case, *Epub* 2008 Nov 18, *Auris Nasus Larynx.* 36 (3) (2009 Jun) 380–382, <https://doi.org/10.1016/j.anl.2008.08.003>, 19019597.
- [11] B.D. Susibalan, Z. Yusof, M. Mansor, M.A. Ahmad, I. Mohamad, *Through and through carotid artery injury from a fish bone*, *Brunei Int. Med. J.* 11 (3) (2015) 167–170.
- [12] A. Rohatgi, J. Papanikitas, R. Sutcliffe, M. Forshaw, R. Mason, The role of oesophageal diversion and exclusion in the management of oesophageal perforations, *Int. J. Surg.* 7 (2) (2009) 142–144, <https://doi.org/10.1016/j.ijso.2008.12.042>.
- [13] D.A. Rigberg, J.M. Centeno, T.A. Blinman, S. Towfigh, D.W. McFadden, Two decades of cervical esophagostomy: indications and outcomes, *Am. Surg.* 64 (10) (1998) 939–941. PMID: 9764696.