



# Various Approaches in Managing Fish Bone Migration: Our Experience in Tertiary Hospital in Sarawak

Yuanzhi Cheah<sup>1,2</sup> · Ting Ting Yew<sup>3,4</sup> · Mohd Razif Mohamad Yunus<sup>2,5</sup> · Ing Ping Tang<sup>1,6</sup> 

Received: 7 October 2023 / Accepted: 3 March 2024  
© Association of Otolaryngologists of India 2024

## Abstract

Ingested fish bone is a common otorhinolaryngology emergency in Malaysia. Fish bone is commonly impacted in the oropharynx for young patients and oesophagus for elderly patients. Rarely, a fish bone migrated extraluminal and require surgical exploration. We report a five cases of fish bone which involved extraluminal migration, and needed repeat CT scans and various types of surgical exploration.

**Keywords** Fish bone · Foreign body · Migrated fish bone · Neck exploration · Microscopic surgery · Computed tomography

## Introduction

Fish bone ingestion is one of the common emergencies encountered by the Ear, Nose and Throat (ENT) Department. Most cases can be removed endoscopically. Rarely, surgical intervention may be needed in cases of extraluminal migration of a fish bone [1]. Computed tomography (CT) scans are essential for diagnosing and locating the fish bone and

assisting surgical planning [2, 3]. Early surgical intervention can prevent serious complications such as oesophageal laceration, and perforation, soft tissue penetration, retropharyngeal abscess, neck abscess, mediastinitis, pulmonary and cardiovascular penetration [2, 3]. We report five cases of fish bone migrated extraluminal which required repeat CT scans and various surgical explorations.

## Case Series

### Case 1

A 68-year-old, gentleman complained of odynophagia after ingesting fish bone on the same day. He was stable and not in respiratory distress. Oral cavity examination was normal. Endoscopic laryngeal examination was unable to locate the foreign body. Computed tomography (CT) of the neck showed 2.5 cm linear foreign body at the hypopharynx (Fig. 1).

Emergency examination under anaesthesia (EUA) and direct laryngoscopy (DL) were performed. Intraoperatively, there was a hematoma in the left vallecular region with a punctum on the left laryngeal surface of the epiglottis, but the foreign body could not be located. Postoperatively, the patient was kept intubated in the intensive care unit (ICU). Empirical intravenous (IV) antibiotics and proton pump inhibitor were administered. Nasogastric (NG) tube feeding was initiated in the ICU.

✉ Ing Ping Tang  
ingptang@yahoo.com

Yuanzhi Cheah  
cheahyuanzhi@gmail.com

Ting Ting Yew  
ttyew@unimas.my

- <sup>1</sup> Otorhinolaryngology Head & Neck Department, Sarawak General Hospital, Kuching, Sarawak, Malaysia
- <sup>2</sup> Otorhinolaryngology Head & Neck Department, Faculty of Medicine, Universiti Kebangsaan, Bangi, Malaysia
- <sup>3</sup> Radiology Department, Faculty of Medicine & Health Sciences, Universiti Malaysia Sarawak, Kota Samarahan, Malaysia
- <sup>4</sup> Institute of Borneo Studies, Kota Samarahan, Malaysia
- <sup>5</sup> Otorhinolaryngology Head & Neck Department, Hospital Canselor Tuanku Muhriz, Kuala Lumpur, Malaysia
- <sup>6</sup> Otorhinolaryngology Head & Neck Department, Faculty of Medicine & Health Sciences, Universiti Malaysia Sarawak, Kota Samarahan, Malaysia



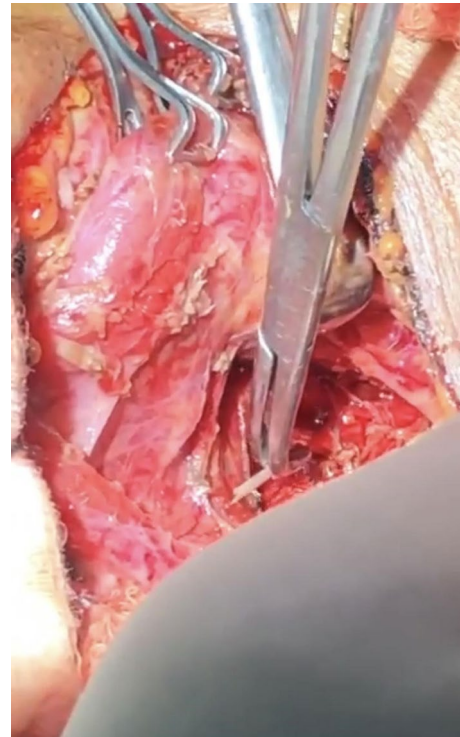
**Fig. 1** Sagittal view of the CT of the neck showed a 2.5 cm linear foreign body in the hypopharynx region (red arrow)



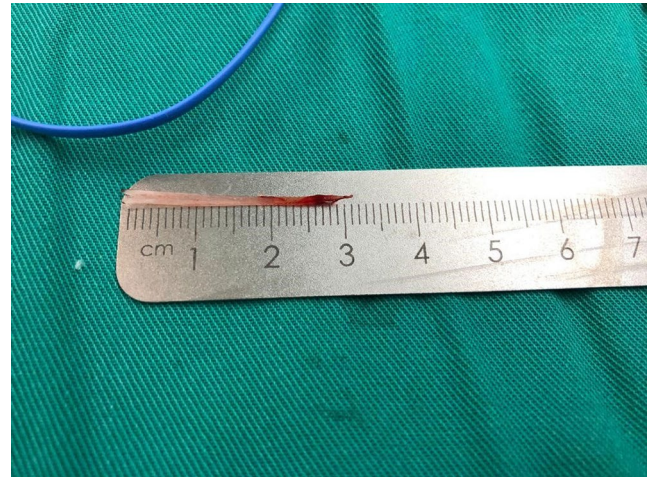
**Fig. 2** Axial view of the CT of the neck showed a hyperdense foreign body in the right lateral wall of the upper esophagus (white arrow)

Flexible scope examination the following day revealed an oedematous airway. Therefore, IV Dexamethasone was continued for a total of three days. Repeated contrast-enhanced computed tomography (CECT) of the neck revealed that the fish bone had migrated to the right lateral wall of upper esophagus (Fig. 2).

Emergency neck exploration, DL, esophagoscopy and external transcervical removal of fish bone were performed. Intraoperatively, a 3.1 cm fish bone was noted to be embedded in the soft tissue between right lateral oesophagus,



**Fig. 3** A 3.1 cm fish bone was removed from the right lateral oesophagus via the external approach



**Fig. 4** A 3.1 cm linear fish bone had been removed

posterior medially to the right carotid and anterior superiorly to the pleural (Figs. 3 and 4). Direct laryngoscopy revealed a broken piece of fish bone which was removed from the right vallecular region.

The patient was extubated uneventfully one day post-operation and discharged four days later with NG tube feeding.

Repeated scope two weeks later showed resolution of left vallecular hematoma and normal appearance of bilateral vocal cords. The NG tube was subsequently removed.

## Case 2

A 50-year-old gentleman presented with sharp pain at the right side of throat after ingesting fish bone a day prior to seek treatment. The pain was aggravated by swallowing. His vital signs were stable, and he was not in respiratory distress.

Examination of the oropharynx noted erythema on the right soft palate with a small laceration wound on the right velar but no foreign body was seen.

Urgent contrast-enhanced computed tomography (CECT) of the neck revealed fish bone within the right pharyngeal mucosa (Fig. 5).

Emergency examination under anaesthesia (EUA) and direct laryngoscopy (DL) were performed. Intraoperatively, the fish bone could not be located, and no point of entry was identified. The patient was subsequently extubated and given antibiotics. The next day, the patient was asymptomatic and discharged with oral antibiotics. During follow up, the patient was asymptomatic, flexible scope noted slough at the right pharyngoepiglottic fold. Repeated CECT of the neck revealed a linear hyperdense fish bone within the right oropharyngeal mucosa space.

The patient was admitted for second EUA and DL. Intraoperatively, the fish bone could not be located; therefore, a right tonsillectomy was performed, and tonsillar bed was dissected to explore the right parapharyngeal space with



**Fig. 5** Coronal view of the CT of the neck showed a fish bone within the right pharyngeal mucosal (red arrow)

the aid of a microscope. The fish bone, measuring 1.7 cm in length was then identified at right parapharyngeal space, superior to the right submandibular gland and encased by soft tissue. The right parapharyngeal region was sutured with Vicryl 2/0.

Postoperatively, the patient was started on NG feeding and oral antibiotics for a week. The patient was discharged well the following day. During follow-up, the right parapharyngeal wound was well healed and the NG tube was removed.

## Case 3

A 55-year-old lady complained of sharp pain in left throat and odynophagia after eating fish one day ago. She was stable under room air. 70-degree endoscopy examination noted a foreign body in the left pyriform fossa with an oedematous left arytenoid, removal attempted but failed. Broad-spectrum antibiotics were started. She underwent emergency EUA, DL, and esophagoscopy. Esophagoscopy was performed up to 18 cm from the upper incisors and noted a small ulcer at the postericoid region; otherwise, no foreign body was seen.

Urgent CECT of the neck revealed a linear fish bone at the right prevertebral mucosal space of the oropharynx, at the Cervical (C) 2/3 level. A second DL and esophagoscopy were performed the next day, an incision was made over the posterior oropharyngeal wall until prevertebral muscle, but the fish bone could not be located. An NG tube was inserted, and the patient was extubated uneventfully.

Repeat CECT of the neck the following day showed presence of pneumomediastinum with fish bone in the right prevertebral mucosa space at the oropharynx, C2/3 level (Fig. 6).

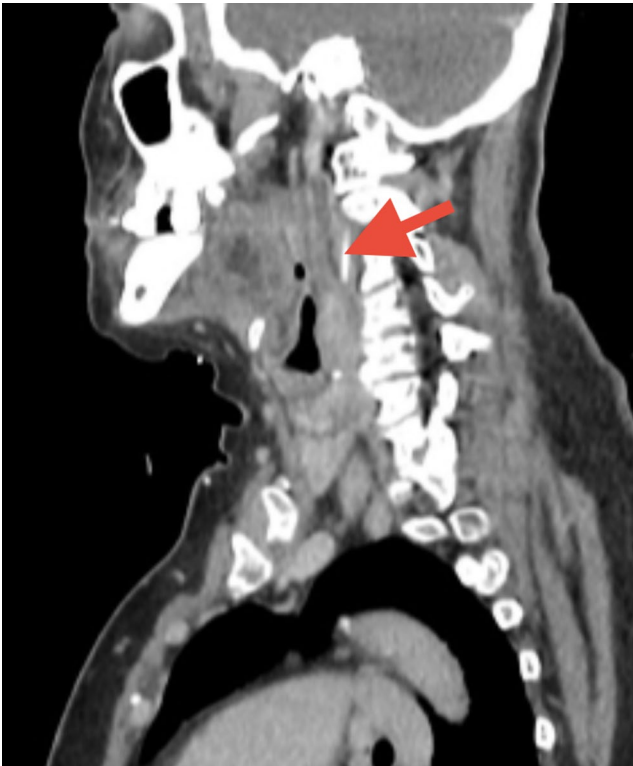
A third surgery of DL and intraoral exploration with the aid of a microscope was done immediately after the CT scan. A fish bone, broken into 4 segments measuring 2.4 cm, was found embedded in the right prevertebral muscle in a lateral oblique direction.

Postoperatively, the patient was extubated uneventfully and discharged on the next day with oral antibiotics for one week and NG feeding. The patient was reviewed in the clinic a week later. Her intraoral wound was well healed, and the NG tube was removed.

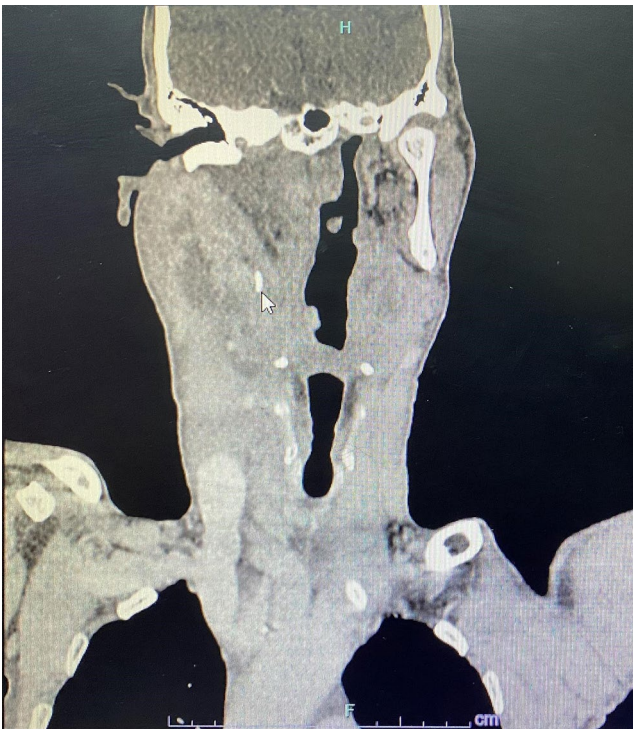
## Case 4

A 70-year-old gentleman with uncontrolled diabetes mellitus presented with worsening neck pain and swelling associated with odynophagia and fever after one-week history of fish bone pricked into the right floor of mouth. On examination, patient had trismus and muffled voice. Oral cavity examination noted a raised floor of mouth. Bedside flexible





**Fig. 6** Sagittal image of the CT of the neck showed a fish bone in the prevertebral mucosa space of the oropharynx, at C2/3 level (red arrow)



**Fig. 7** Coronal view of the CECT of the neck showed a linear hyperdense foreign body in the right submandibular region (white arrow) and multiple loculated collection at the floor of the mouth



**Fig. 8** Coronal view of the CECT of the neck showed a hyperdense foreign body at the right parapharyngeal space (white arrow)

scope noted oedematous epiglottis and base of the tongue was extending posteriorly.

CECT of the neck was done and noted linear hyperdense foreign body in the right submandibular region. There was a multiloculated rim-enhancing collection at the floor of the mouth (Fig. 7).

Empirical IV antibiotics were given, and emergency external incision and drainage, along with foreign body removal were performed. Intraoperatively, about 80 ml pus was drained, with the abscess cavity extending from the right submandibular to the left submandibular space; no fish bone was seen.

Another CECT of the neck repeated post-operation, noted a hyperdense foreign body in the right parapharyngeal space (Fig. 8).

Neck exploration was subsequently performed. Intraoperatively, a defect at the right lateral pharyngeal wall and right anterior pillar was noted, and the soft tissue was explored with blunt dissection. However, no fish bone was identified. X-ray image intensifier (II) was utilized intraoperatively, but still failed to locate the foreign body. A surgical patty was sutured at the right parapharyngeal space for radiological assistance. The patient was sent for another urgent CT scan from the operative theatre with the surgical patty in situ. CECT of the neck noted an unchanged hyperdense linear foreign body in the right submandibular region, at the C2 level, which is seen anterolateral to the surgical patty placed (Fig. 9).

Re-exploration of the neck wound was done immediately after the CT scan. A ~1.5 cm fish bone was seen at the right lateral pharyngeal wall at the level of the tongue base. The pharyngeal defect was closed with absorbable suture.

Post-operation, the neck wound was dressed with modern dressing. NG feeding was initiated. Blood glucose was well controlled with the initiation of subacute insulin.

Wound debridement, secondary suturing and reconstruction with a pectoralis major rotational flap were performed twelve days after the previous operation.

Five days after the last operation, the patient was discharged with continued NG feeding with a total of 24 days of hospital stay.

### Case 5

A 57-year-old gentleman with persistent sharp throat pain after ingesting fish bone six days prior presented to our center. Oral examination and endoscopic examination were unremarkable. Urgent CT of the neck was done and noted a linear hyperdense structure at the right mucosal pharyngeal space, inferomedially orienting towards the hyoid bone (Fig. 10).

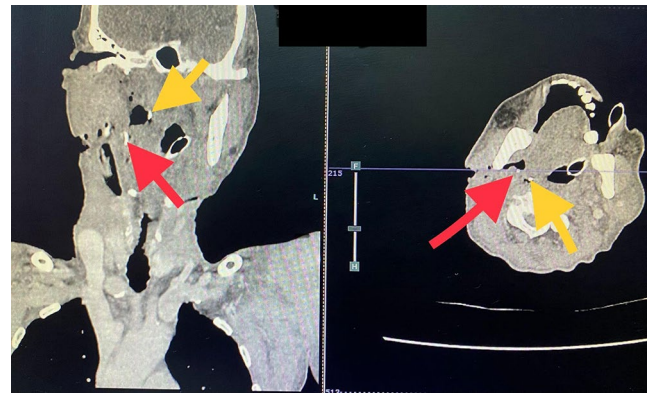
Emergency EUA, DL, right tonsillectomy, and transoral exploration via right tonsillectomy wound were performed. A Boyle-Davis mouth gag was introduced, and a surgical microscope was used to help explore the fish bone. A 1 × 0.1 cm fish bone wrapped around by a fibrous band was found in the right parapharyngeal space, as shown in the CT scan.

The patient was discharged well on postoperative day one with oral antibiotics for another week. Subsequent follow-up in the ENT clinic noted that the wound was well healed, and the patient was allowed to resume oral intake.

### Discussion

Fish bone is a major cause of foreign bodies ingestion in the upper aerodigestive tract in Asian populations due to dietary habits of eating whole fish [1, 4]. Known risk factors include using chopsticks or cutlery, deboning fish in the mouth and wearing dentures while eating [5]. Migration of fish bone is more common among elderly patients, as shown in this case series where the patients are 50 years old and above.

The main initial clinical presentation is sudden pain which was caused by mucosa damage. However, after the fish bone passes through the pharyngeal or esophageal wall, the pain may be less prominent [4, 6]. This happened in the second case where the patient did not have any symptoms during follow-up, but examination findings and clinical suspicions warranted a CT scan to look for a migrated fish bone.



**Fig. 9** Coronal and Axial views of the CT scan of the neck showed a foreign body (red arrow) and a surgical patty (yellow arrow)



**Fig. 10** Sagittal view of the CT of the neck showed a linear hyperdense structure in the right mucosal pharyngeal space, inferomedially orienting towards the hyoid bone

In adults, the most common site of fish bone impaction is the oropharynx and hypopharynx, especially the tonsils, tongue base, vallecula, and pyriform sinus, followed by the oral cavity and esophagus, especially areas with physiological narrowing [1]. Fish bones that are sharp and linear in shape are more likely to penetrate the mucosa of the aerodigestive tract [7]. Swallowing and peristalsis during the propulsion of food can cause the fish bone to further pierce the mucosa and migrate outside the lumen [8].

A plain neck radiography in the lateral view is the initial imaging method used to detect ingested bones in the oropharynx and upper esophagus. However, the sensitivity and specificity were as low as 39% and 72% respectively [9]. This is



mainly due to the anatomical location at the cricopharyngeus muscle, horizontal orientation and different optical density of the fish bones. Other normal anatomical structures and soft tissue masses can also mimic the presence of a foreign body on a lateral neck radiography, such as partial ossification of the superior cornu of the thyroid cartilage, arytenoid cartilage, posterior lamina of the cricoid cartilage, the stylohyoid and thyrohyoid ligaments, the styloid processes and vascular calcifications [10].

Preoperative imaging, particularly CT of the neck is crucial for locating migrated fish bones. A CT scan has a high sensitivity of 100% and specificity of 93.7% in detecting fish bone impaction [1]. Hence, CT has become a standard diagnostic tool to provide valuable information about the exact location, size, orientation and relationship of the fish bone to adjacent anatomical structures. It also helps to identify complications such as penetration, perforation and abscess formation.

It is important to note that the position of the foreign body in the neck during CT scans may differ from its position during surgery due to the mobility of soft tissue relative to bony and cartilaginous structures. Therefore, the distance of the foreign body to the nearest anatomical reference point is beneficial for surgeons to plan the approach of the surgical exploration. Urgent CT scan is needed if a fish bone is not found intra-operatively.

Direct laryngoscope and endoscope are commonly used to remove foreign bodies in the oropharynx. However, in the fifth case which we encountered, the direct laryngoscope has limited the surgical field. Hence, a Boyle-Davis mouth gag was employed associated with an operative microscope to remove the fish bone. With this method, the surgeon is allowed to use both hands, more surgical space is allowed, and the assistance could retract the surrounding soft tissue more easily, ultimately making the fish bone removal successful. Besides, tonsillectomy could be done to access the parapharyngeal space.

Late presentation may lead to fatal complications [3]. Both case 4 and case 5 patients delay in presenting to hospital; however, both cases have different outcomes. The location of the migrated fish bone and patient's co-morbidities could be the factors in determining the risk of complications. Fortunately, no vital structures were injured by the fish bone in all the cases above. Timely CT scan and proper surgical exploration do prevent unwanted complications.

## Conclusion

Fish bone ingestion with extraluminal migration can cause devastating sequelae. Despite clinical examination, thorough investigation including endoscopy and CT scan are crucial to prevent any delay in diagnosis

and treatment. Preoperative CT of the neck should be performed if fish bone is not able to be identified endoscopically and extraluminal migration is suspected. The use of mouth gag with a surgical microscope should be considered to explore fishbone intraorally if traditional DL fails to locate the fishbone. Parapharyngeal space fish bone can be explored via intraoral approach with tonsillectomy done. CT scan should be repeated without delay if fish bone is not identified during the operation.

## Declarations

**Ethical Approval** The authors declare that they are compliant with standards, no funding involved, no conflict of interest and ethical approval has been obtained.

## References

1. Kim JP, Kwon OJ, Shim HS, Kim RB, Kim JH, Woo SH (2015) Analysis of clinical feature and management of fish bone ingestion of upper gastrointestinal tract. *Clin Exp Otorhinolaryngol* 8(3):261–267
2. Klein A, Ovnat-Tamir S, Wu, EnHao et al (2018) Migratory fish bone in the thyroid gland: case report and literature review. *Case reports in medicine* (2018)
3. Thuduvage VS (2021) Migrated fish bone into the neck: a case report. *J Med Case Rep* 15:1–4
4. Kim HU (2016) Oroesophageal fish bone foreign body. *Clin Endoscopy* 49(4):318–326
5. Arulanandam S, De SD, Kanagalingam J (2015) A prospective study of epidemiological risk factors for ingestion of fish bones in Singapore. *Singapore Med J* 56(6):329
6. Wu E, Huang L, Zhou Y, Zhu X (2018) Migratory fish bone in the thyroid gland: case report and literature review. *Case reports in medicine*. ;2018
7. Salting AO (2018) Not just another sore throat: Extraluminal migration of foreign body from the hypopharynx—a case report. *SAGE Open Med Case Rep* 6:2050313X18803533
8. Shaariyah MM, Salina H, Dipak B, Majid MN (2010) Migration of foreign body from postcricoid region to the subcutaneous tissue of the neck. *Ann Saudi Med* 30(6):475–477
9. Lue AJ, Fang WD, Manolidis S (2000) Use of plain radiography and computed tomography to identify fish bone foreign bodies. *Otolaryngology—Head Neck Surg* 123(4):435–438
10. Liew CJ, Poh AC, Tan TY (2013) Finding nemo: imaging findings, pitfalls, and complications of ingested fish bones in the alimentary canal. *Emerg Radiol* 20:311–322

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor (e.g. a society or other partner) holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.