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RESEARCH ARTICLE
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MIGRATED FOREIGN BODY OF THE UPPER AERODIGESTIVE TRACT REMOVED BY OPEN APPROACH: A CASE SERIES

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Abstract:
Introduction: Foreign body in the upper aerodigestive tract, although a common, fish bones form 85% of those foreign bodies. Foreign body penetrate the cricopharyngeal and cervical oesophageal mucosa and reside extramurally in the soft tissue of the neck. Migration should be suspected when the foreign body is documented radiographically with negative endoscopy. Complicated cases with migrated foreign bodies in the hypopharynx, cervical or thoracic oesophagus might require open procedures such as lateral pharyngotomy, thoracoscopy and thoracotomy. There are several case reports of migrating foreign bodies managed by the open pharyngotomy approach that have been published but no case series were published till date. 1st time, we are presenting the case series of migrated foreign bodies in the upper aerodigestive tract were removed by lateral pharyngotomy approach in our institutional experience.
Conclusions: A CT scan of the neck is very helpful in identifying the location of the foreign body. Intraoperative C-arm can also be used for locating the foreign body. Endoscopic examination is usually negative for a migrated foreign body. Hence, an open pharyngotomy approach is mandatory for a safe and effective means of managing migrating foreign bodies and preventing associated complications.
Keywords: Migrating foreign body, Lateral pharyngotomy, Retropharyngeal abscess, Mediastinitis, Prevertebral muscles, C-arm.

INTRODUCTION:

Foreign body in the upper aerodigestive tract, although a common and challenging problem, its management depends on many factors such as anatomical location, shape and size of foreign body and duration of impaction. Fish bones form 85% of those foreign bodies.[1] Most fish bone foreign bodies are stuck in the palatine tonsils or the posterior part of the tongue.[2] Rarely does the foreign body penetrate the cricopharyngeal and cervical oesophageal mucosa and reside extramurally in the soft tissue of the neck. Migration should be suspected when the foreign body is documented radiographically with negative endoscopy. These migrating foreign bodies can remain quiescent or can cause life-threatening suppurative or vascular complications. Computed tomography (CT) of the neck greatly assists in diagnosing a migrating foreign body. Conventional minimal invasive approaches such as Flexible Upper Gastrointestinal Endoscopy (UGI), Direct Laryngoscopy, and Rigid Esophagoscopy have little or no role in such circumstances. Intraoperative C-arm is a valuable tool for identifying the depth of the foreign body and guiding the dissection. Complicated cases with migrated foreign bodies in the hypopharynx, cervical or thoracic oesophagus might require open procedures such as lateral pharyngotomy, thoracoscopy and thoracotomy. There are several case reports of migrating foreign bodies managed by the open pharyngotomy approach that have been published. But there was no case series of migrating foreign bodies managed by the open approach that had been published.Here, we report five cases of migrating foreign bodies in the neck removed by the open pharyngotomy approach. Cases no. 4 and 5 have already been published in the International Journal of Otorhinolaryngology and Head Neck Surgery as separate case reports.

CASE SERIES

CASE 1

A 50-year-old male patient with a history of Chronic Kidney Disease (CKD) presented with complaints of pain while swallowing, along with a foreign body sensation in the throat for 2 days, following a history of fish bone ingestion. X-ray soft tissue neck revealed no foreign body. After nephrology consultation, Direct laryngoscopy and Rigid esophagoscopic examination were done under sedation, posterior pharyngeal wall oedema was noted, but no foreign body could be seen in the lumen. On CT scan neck, a hyperdense object, probably the foreign body, was seen in the right prevertebral space, with overlying soft tissue oedema at the level of C3 and C4 cervical vertebral bodies (Figure: 1.1). Neck exploration with right lateral pharyngotomy approach under general anaesthesia was planned after taking clearance for the surgery from the nephrologist. Written and informed consent was taken.

The surgical steps were as follows:

Step 1:

A 4 cm horizontal skin crease incision was marked at the level of the hyoid.

Step 2:

2% Lignocaine + Adrenaline (1:80000) infiltrated along the line of incision.

Step 3:

The Superior and inferior subplatysmal flaps were raised. Ipsilateral sternomastoid retracted laterally, and the carotid sheath was exposed.

Step 4:

Infrahyoid strap muscles retracted medially, exposing the inferior constrictor of the pharynx.

Step 5:

The hyoid bone, the Hypoglossal Nerve, the Lingual Artery, the Superior Laryngeal Nerve, the Superior Thyroid vessels, the Superior Laryngeal vessels and the Posterior border of the Thyroid lamina were identified.

Step 6:

Superior Laryngeal vessels clamped, ligated and divided. The pharyngeal lumen was entered by lateral pharyngotomy, performed by incising through the inferior constrictor muscle and pharyngeal mucosa at the posterior border of the Thyroid lamina.

Step 7:
The foreign body was explored in the right prevertebral space soft tissue plane, and removed by incising the posterior pharyngeal wall (Figure: 1.2). Fish bone foreign body (Figure: 1.3).
Step 8:
The posterior pharyngeal wall mucosal incision was closed with 3-0 Vicryl. Pharyngotomy was closed in layers using 3-0 Vicryl. Subplatysmal flap and skin closed in layers. 12 FG suction drain secured.

Post-operative period:
There was no complications.
Postoperatively, the drain was removed after 24 hours, and the patient was on Ryle's tube feeding for 7 days and started oral liquid diet on post op day 8, and soft diet started after day 10, then patient was discharged.

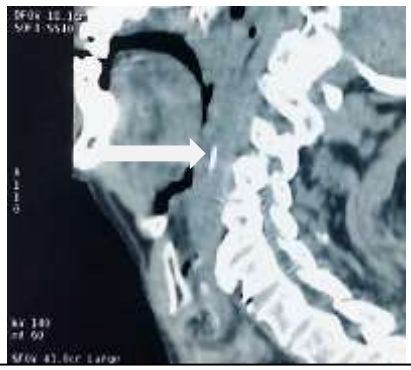

Figure 1.1: Computed Tomography (CT) imaging showing foreign body in the prevertebral space in sagittal view (white arrow).

Figure 1.2: Prevertebral space with foreign body (white arrow)

Figure 1.3: Foreign body Fishbone

CASE 2

A 23-year-old female patient, who was a known case of type-1 diabetes mellitus, came with difficulty in swallowing with fever for 5 days, with a history of a pork bone stuck in the throat 5 days back. With X-ray soft tissue neck (Figure: 2.1) and complemented by clinical examination findings, retropharyngeal abscess extending laterally into the parapharyngeal space was found and initially started conservative treatment with intravenous antibiotics and supportive medications. On day 2 of admission, the retropharyngeal abscess was drained per orally with a wide-bore needle under local anaesthesia.After the posterior pharyngeal wall swelling had reduced significantly with intravenous antibiotics and strict blood glucose control. On day 4, exploratory flexible upper gastrointestinal endoscopy was done, but no foreign body was located in the lumen of the esophagus.

With the CT scan, it was confirmed that the foreign body was stuck in the retropharyngeal soft tissue, and hence, open pharyngotomy was done, and the foreign body was found stuck in the soft tissue plane against the body of the C4-C5 vertebrae. During the postoperative period, she developed a wound abscess and was treated with intravenous antibiotics as per the culture sensitivity report; the patient's general condition improved. The patient was on Ryle's tube feeding during the hospital stay, and she was discharged after 26 days.

Figure 2.1: X-ray soft tissue neck showing slender radio-opaque shadow at C5 level with increased retropharyngeal soft-tissue shadow with emphysema involving deep neck space and subcutaneous space (White area).

CASE 3

With the chief complaint of mild throat pain while swallowing and neck movement, a 15-year-old female patient presented in our outpatient department with a history of fish bone ingestion 1 week back. For which she went to a local quack, but of no relief. Examination of the neck, Muir's crackle was absent, and a 70-degree rigid endoscopic examination of the larynx showed pooling of saliva in both pyriform fossa sinuses. An X-ray of the soft tissue of the neck reveals a slender and long radio-opaque foreign body within the pre-vertebral soft tissue of the neck at the level of C3-C5 cervical vertebrae (Figure: 3.1). As the possibility of endoscopic removal of the foreign body was minimal, a straightaway open approach via right lateral pharyngotomy was planned and executed. A foreign body was found in the prevertebral muscle plane and was removed (Figure: 3.2). After achieving complete haemostasis, the incisions were closed in layers, and Ryle's tube was inserted. The post-operative period was uneventful; a repeat X-ray of the soft tissue neck was ordered, and no radio-opaque shadow (foreign body) was found. The patient was on nil per oral for 5 days. The liquid diet started on day 6, and the patient was discharged on postoperative day 8 with advice to start on semi-solid diet from day 10.

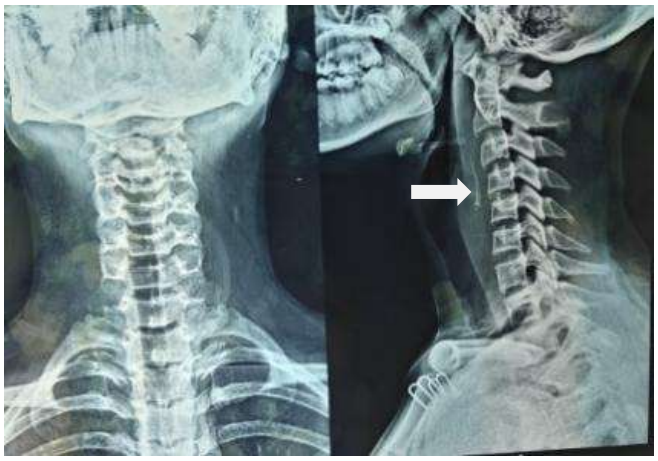

Figure 3.1: Xray imaging showing foreign body in prevertebral space (White arrow)

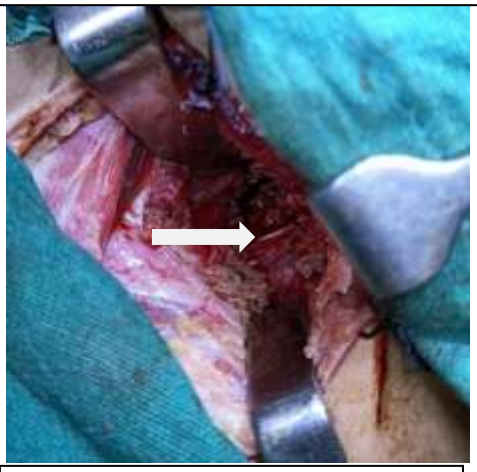

Figure 3.2: Prevertebral space with foreign body (White arrow)

CASE 4

A 34-year-old male patient presented with a history of accidental beef bone ingestion. He presented with foreign body sensation in throat along with dysphagia, odynophagia, neck pain. Oral examination was unremarkable. Laryngeal crepitus was absent. Laryngeal framework was tender on palpation. Indirect laryngoscopy showed congested and oedematous posterior pharyngeal wall and arytenoids, otherwise no foreign body was noted. X ray soft tissue of neck – lateral and anteroposterior views reveal a radio-opaque foreign body at the level of C4 vertebrae with loss of cervical lordosis and retropharyngeal abscess (Figure: 4.1).

Figure 4.1: Lateral and anteroposterior radiograph of the patient showing radio opaque foreign body at the level of C4 vertebral body.

Informed and written consent for rigid endoscopy as well as lateral pharyngotomy taken. The direct laryngoscopy showed oedematous posterior pharyngeal wall mucosa, the foreign body could not be visualised. With the help of C-arm, the exact location of the foreign body was identified (Figure: 4.2). Left lateral pharyngotomy was performed. The foreign body was found to be impacted in the retropharyngeal space and removed (Figure: 4.3), and it was of 2.4 cm length (Figure: 4.4). No postoperative complications were noted. A nasogastric tube was inserted, a suction drain was placed, the pharyngeal mucosa was repaired, and the wound was closed in two layers. Postoperatively patient was kept nil per oral. The drain was removed on postoperative day 3. The patient was on Ryle's tube feeding for 5 days. Patient was discharged with the advice to take only liquid diet from day 6 and semi-solid diet from day 10.

Figure 4.2: Intra-operative localisation of foreign body using C arm (Black arrow head).

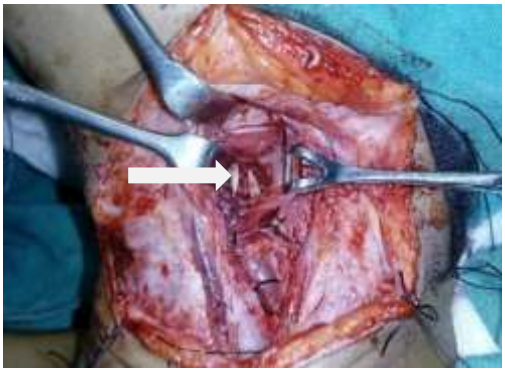

Figure 4.3: Neck exploration showing beef bone in the retropharyngeal space (White arrow).

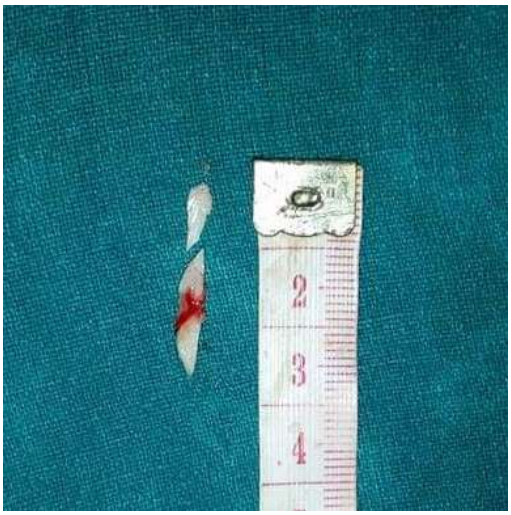

Figure 4.4: Foreign body Beef Bone after removal.

CASE 5

A 42-year-old male with no comorbidities came with the sensation of a foreign body in the throat, difficulty and pain during swallowing for 10 days. Symptoms started after accidental ingestion fishbone. Local examination of the oral cavity and oropharynx was normal. A rigid 70-degree telescopic laryngeal examination showed congestion of the posterior pharyngeal wall and pooling of saliva in both pyriform fossae. X-ray soft tissue neck lateral view revealed a single, slender radio-opaque shadow against C3, C4 and C5 level with increased prevertebral soft tissue shadow and loss of cervical lordosis (Figure: 5.1). CECT neck with 3D reconstruction showed a 3mm thin and 33mm long hyperattenuating foreign body (fishbone), impacted in the prevertebral space at C3 to C5 level (Figure: 5.2A, 5.2B, 5.2C).

Figure. 5.1: X-ray soft tissue neck-A slender radio-opaque foreign body against C3, C4, and C5 levels with increased prevertebral soft tissue shadow and loss of cervical lordosis (White arrow).

After consent, the patient was taken up for rigid laryngoscopic examination under general anaesthesia with orotracheal intubation, which was negative for the foreign body and the intraoperative c-arm could not identify the foreign body distinctively as it was superimposed by cervical spine shadow. Hence, neck exploration proceeded with the right lateral pharyngotomy approach, the foreign body

was found lodged in the prevertebral space and removed (Figure. 5.3 and 5.4). No intraoperative complications were encountered. A nasogastric tube was inserted. The patient was on Ryle's tube feeding for 7 days and started oral liquid diet on post op day 8, and soft diet started after day 10, then patient was discharged.

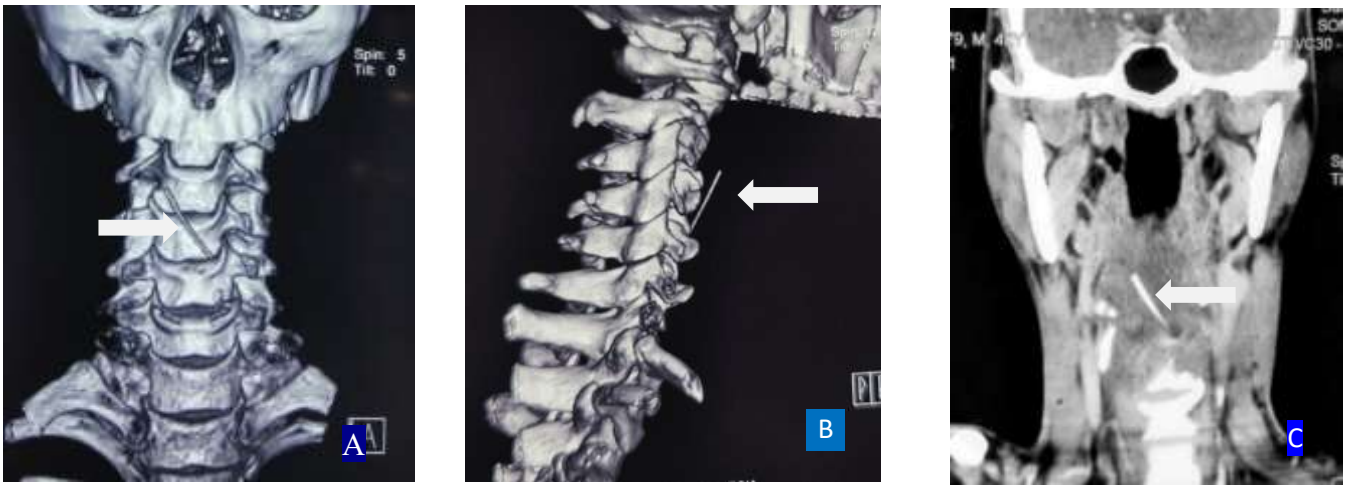

Figure. 5.2A, 5.2B, 5.2C: CECT neck with 3D reconstruction- Evidence of thin(3mm) and elongated (33mm) high attenuating bony foreign body (fishbone), impacted in prevertebral space (C3–C5) level (White arrow).

Figure. 5.3: Prevertebral space with foreign body (White arrow).

Figure. 5.4: Foreign body Fish Bone

DISCUSSION

Lateral pharyngotomy means sectioning the lateral wall of the pharynx. This approach was first described in 1929 by the British surgeon William Trotter.[3] It was later modified by others for Head-Neck cancer for resecting tumours originating in the hypopharynx (posterior hypopharyngeal wall, lateral pharyngeal wall, lateral aspect of the pyriform sinus) or oropharynx (lateral tongue base, subtonsillar region, glossotonsillar sulcus). This same surgical procedure is also used in the removal of extraluminally migrated foreign bodies in the hypopharynx and cervical oesophagus. The accidental ingestion of a foreign body is a common occurrence, and while most foreign bodies pass through the oesophagus without causing any harm, those that lodge in the upper oesophagus are a challenging problem. Not only can it lead to lots of complications, but it can also lead to a very disturbing condition for the patient, both physically and psychologically. Hence, urgent removal of the foreign body is much warranted as soon as it is diagnosed. Migrated fish bone can be complicated with neck abscess, vascular complications, and retention in the thyroid gland.[4] Carotid artery injury due to the migrating fish bone, which accompanies infection, the risk of bleeding was estimated to be high, and emergency surgery should be performed after thorough hemostasis.[5] Pseudotumor of the

liver has been reported on rare occasions when the fish bone has migrated to the gastrointestinal tract.[6] A foreign body in the upper oesophagus can lead to symptoms such as dysphagia, odynophagia, drooling of saliva, and respiratory distress. Timely diagnosis and intervention are crucial to prevent complications such as aspiration, abscess formation, migration, deep neck space infection, including mediastinitis, sepsis. Initial assessment involves a thorough history and physical examination, followed by imaging studies such as X-rays, Computed Tomography (CT scan) and endoscopy to confirm the presence and location of the foreign body. The sensitivity and specificity of plain radiography were reported as 39 % and 72 %, respectively.[3] A CT scan can be considered the best diagnostic tool for better detecting foreign body type, size, orientation, location and its relationship to other vital structures in the neck. Management depends on many factors, such as the nature of the foreign body, the anatomic location, the shape and size of the foreign body and the duration of impaction. The Flexible endoscopy, often the preferred modality for both diagnosis and initial attempts at removal. While endoscopic removal, successful in many cases, certain factors may complicate the procedure, such as the type and size of the foreign body, anatomical considerations and the patient's co-operation. In case of migrating foreign body that deeply embedded within parapharyngeal or retropharyngeal soft tissues, or endoscopic retrieval fails or is contraindicated, surgical approach via pharyngotomy will be necessary. Open pharyngotomy involves the surgical opening of a portion of the pharynx to access and remove the foreign body. An incision in the neck, depending upon the area of interest, followed by careful dissection of underlying tissues and muscle, preserving vital structures, while ensuring complete removal of the foreign body. Postoperatively, all cases were treated with intravenous antibiotics. X-ray soft tissue neck was repeated on post-operative day 1 for confirmation. All the patients were kept nil oral, and Ryle's tube feeding was continued for 1 week, followed by a liquid diet, then a soft diet was started. Except case 2 was on Ryle's tube feeding for 26 days due to wound infection. In our case series, we had cases diagnosed with migrated foreign bodies in the neck, which were removed by the lateral pharyngotomy approach under general anaesthesia by orotracheal intubation. Surgical steps had already been described in 1st case of this case series similar technique was carried out in other cases too.

Other possible routes of entry into the pharynx include:

1. Through the hyoid bone, at the junction between the lesser and greater horns.
2. Through the thyroid cartilage.
3. Through the constrictor muscles, at the posterior edge of the thyroid lamina.[8]

In our case 4, the C-arm was used intraoperatively to identify the exact site of the foreign body, which was already published as a case report in the International Journal of Otorhinolaryngology and Head and Neck Surgery in October 2024.[9]

However, in our case 5, the intraoperative C-arm was used to detect the exact site of the foreign body, but was unable to identify it as it was superimposed by the cervical spine shadow, this case also published in the International Journal of Otorhinolaryngology and Head and Neck Surgery in June 2025.[10]

CONCLUSION

Foreign body that migrates from their original position in the lumen of the upper oesophagus pose a diagnostic and therapeutic challenge, necessitating a multidisciplinary approach for optimal management. A CT scan of the neck is very helpful in identifying the location of the foreign body and the relative position of the vital structures. Intraoperative C-arm can also be used for locating the foreign body. Endoscopic examination is usually negative for a migrated foreign body. Hence, an open pharyngotomy approach is mandatory for a safe and effective means of managing migrating foreign bodies and preventing associated complications.

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