CASE REPORT

Usual suspects: the foreign bodies of the aerodigestive tract

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SUMMARY

This case series is about four different foreign bodies lodged in different locations of the aerodigestive tract. All four cases had delayed diagnosis due to inconspicuous history. Radiology in the form of computed tomography aided the appropriate diagnosis in most of these cases. Though all four patients have been successfully managed by removal of foreign body, not all of them have identical outcomes. A brief discussion about predictive factors in the fish bone foreign body has been included. The authors also discuss certain critical aspects of the management, which may aid in reducing the morbidity. We emphasise on the high index of suspicion in peculiar cases and on the low threshold for radiological investigation in doubtful clinical scenarios.

BACKGROUND

Foreign body ingestion and insertion are one of the most commonly seen cases in otorhinolaryngology practice. Though most of these cases would simply require an extraction, some of them may pose a significant challenge, and few may even lead to irreversible damage resulting in morbidity and mortality.^{1–3} Through the description of four unique cases of foreign bodies in the upper aerodigestive tract, this report aims to shed a light on the peculiar trends seen in such cases.

CASE PRESENTATION**Case 1**

A 5-year boy who was already receiving treatment for upper respiratory tract infection elsewhere was referred to our tertiary care centre when he did not respond to the therapy. Examination revealed congestion of nasal mucosa along with blood-stained nasal discharge and a dark necrotic crust on both sides' nasal cavities. Though there was no history of any foreign body insertion, the suspicious finding on nasal examination prompted for computed tomography (CT) of the paranasal sinuses, which demonstrated radiodense opacities in both the nasal cavities as shown in [figure 1](#). Nasal endoscopy under anaesthesia revealed two separate foreign bodies, a button battery and a used eraser piece in the right and the left nasal cavities, respectively. After removal of these, mucosae of the inferior turbinate and the septum were seen necrosed. Over the next 3 weeks, the septal cartilage also got necrosed leaving behind a septal perforation.

Case 2

A 1½-year-old male child had 3-month history of intermittent fever and cough. He had no swallowing difficulty or any other symptoms and had received courses of antibiotics at various hospitals prior to being referred to our institute. On examination, apart from having slightly reduced air entry on the left side, there were no other abnormal findings. CT showed a radio-opaque shadow in the left main bronchus as in [figure 2](#). He was taken up for rigid bronchoscopy under general anaesthesia and a peanut was removed from left main bronchus, in two pieces. The patient had an uneventful post-operative period.

Case 3

A 42-year-old man presented with throat irritation and soreness for last 3 days. He had no dysphagia or voice change. Examination of oral cavity, oropharynx and larynx did not reveal any abnormality, however, pooling of saliva was noted in right-side pyriform sinus. Plain roentgenogram showed a radiodense foreign body in the hypopharynx as shown in [figure 3](#). With the suspicion of foreign body throat, the patient was subsequently questioned again, to which he gave the history of eating fish 3 days ago. The patient was explained about the diagnosis and check endoscopy was planned after taking consent. However, while the patient was waiting to be shifted to the operation room, he had induced gagging on himself, resulting in extrusion of a fish bone. The patient did refuse to undergo any further procedure, however, had no further symptoms.

Case 4

A 53-year-old male patient with type 2 diabetes came with a history of progressive dysphagia for 4 days, which had started following intake of a fish meal. There was no breathing difficulty and change of voice, however, the patient had developed absolute dysphagia since the previous night. On examination, there was a bulge in the right lateral pharyngeal wall with pooling of secretions in bilateral pyriform sinuses. Rest of the endolaryngeal areas were normal with mobile vocal folds and adequate glottic chink. The CT showed dense foreign body at the level of cricopharynx with surrounding soft-tissue oedema in retropharyngeal and parapharyngeal spaces, as shown in [figure 4](#). He underwent transoral extraction of the foreign body along with drainage of

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Figure 1 Plain CT of the paranasal sinuses showing a radiodense foreign body in the right nasal cavity (arrow) and relatively less radio-opaque foreign body in the left side cavity. Inset: button battery and used eraser foreign bodies shown after removal.

parapharyngeal and retropharyngeal collection. Postoperatively, he had an uneventful recovery and was started on oral feeds on day seven.

OUTCOME AND FOLLOW-UP

The patient in case 1 developed septal perforation over 3 weeks of foreign body insertion. The patient in case 2 had recurrent pneumonia like illness due to foreign body bronchus. The patient in case 3 had self-extrusion of fish bone from hypopharynx, whereas that in case 4 developed retropharyngeal abscess secondary to impacted fish bone in the hypopharynx.

Figure 2 Plain CT of the chest showing a radio-opaque foreign body in left main bronchus (arrow) and relatively hyperinflated lung fields on the same side. Inset: broken pieces of peanut shown after removal.

Figure 3 Plain roentgenogram of neck showing a linear foreign body in hypopharynx (arrow). Inset: liner fish bone of 3.5 cm after its extrusion by the oral route.

DISCUSSION

In all four cases described, the diagnosis of foreign body was delayed until it became quite obvious. In the first three cases, not even a distant mention about any foreign body insertion

Figure 4 Contrast-enhanced CT of neck showing radiodense foreign body (arrow) which has migrated transmucosally, inducing inflammation in retropharyngeal space. Inset: curved fish bone with sharp edges shown after its removal.

was there during the clinical evaluation. In the fourth case also, although the symptoms started following fish meal ingestion, the diagnosis was delayed. The foul-smelling nasal secretions in the first case, the pooling of saliva in the third case and the absolute dysphagia in the fourth case were the suspicious features which led to the radiological investigation and appropriate diagnosis in our cases. This delayed diagnosis resulted in morbidity in the form of septal perforation in the first case and retropharyngeal abscess in the fourth case, both of which could have been avoided by early identification and timely removal of these foreign bodies.

Among all the foreign bodies, button battery could be most hazardous, as it can dispense its charge causing liquefactive necrosis of the surface in contact.⁴ The resultant damage could at times be fatal, depending on the site of lodgement.³ Among the various prognostic factors predicting long-term morbidity due to button battery insertion, 'the time since impaction' remains one of the important factor.⁵ Longer this charged foreign body stays in contact with a mucosal surface, larger is the surrounding tissue necrosis and higher is the probability of long-term morbidity or mortality. Septal perforation is shown to occur in almost all cases of button battery inserted into the nose, even after its removal.⁶ The most efficient way to tackle damage due to button battery foreign body is by preventing its insertion, however, once inserted, earliest removal is the best possible treatment option, which could only be accomplished by early diagnosis.

In the second case also, the symptomatology of the child was not suspicious of foreign body, because of which the diagnosis of an aspirated foreign body was delayed and the diagnosis could only be established after computer tomography. Fortunately, there was no implication of this delay and the broken peanut in left primary bronchus was removed safely without any long-term sequelae. However, had this foreign body be same sized button battery or fresh vegetative matter, it could have inflicted substantial damage by the time of diagnosis and the outcome could have been unfavourable. This reinforces the need for high index of suspicion among clinicians and a low threshold for radiological investigations in suspicious cases, especially in children. The authors would like emphasise that the computer tomography can be helpful even in radiolucent foreign bodies, many times by themselves picking up foreign bodies or at times, by showing surrounding inflammatory changes, which would aid in appropriate diagnosis like in our case.

Another trend to be noted in these cases is that the foreign bodies of same nature lodged in the same location can behave differently. Though both the patients in case 3 and case 4 had fish bone impacted in the hypopharynx, one had oral extrusion of fish bone by self-induced gagging, whereas the other patient had transmucosal migration inducing retropharyngeal abscess. The oral extrusion of fish bone stuck in the hypopharynx for 4 days has not been described earlier in the literature, which prompted the authors to identify factors that might have contributed to this outcome in case 3. As discussed in subsequent paragraphs, certain characteristics of the fish bone foreign body are detrimental to the overall outcome.

The orientation of the long axis of the impacted fish bone, with respect to that of the pharynx, seems to be one of the most important factors. Generally, the impacted fish bones lying parallel to the long axis of pharynx/oesophagus have the maximum chance of disimpaction and non-traumatic distal passage, whereas the fish bones lodged either transversely or obliquely have a higher chance of the perforation through the wall.⁷⁻⁹ In our patients, the parallel orientation of the fish bone in case 3 might have assisted an easy transoral extrusion and

the transverse lodgement in case 4 might have led to deeper impaction and mucosal injury. Reported cases of extraluminally migrated fish bone foreign bodies were found to have transverse orientation at the site of lodgement.^{10 11} Though the patient in case 3 had successfully extruded impacted fish bone from the pharynx by self-induced gagging, the authors discourage such an approach as the majority of fish bones in pharynx would have the transverse orientation, unlike the favourable situation in this case.¹² Moreover, the fish bones impacted transversely are likely to be missed by plain radiographs compared with the ones impacted vertically.¹³

The size and the shape of fish bone are the other factors determining prognosis. Small and linear bones have more chance of easy distal passage as compared with large and triangular bones.¹⁴ The fish bone ingested by the patient in case 3 was less than 4 cm in size and was of a linear shape, facilitating easy transoral extrusion, whereas, the fish bone swallowed by the patient in case 4 was non-linear, which could have contributed for its failure to migration. However, once impacted even linear foreign bodies are likely to have transluminal migration causing complications.^{8 10 11 15 16} The sharpness at the edge of the fish bone and the duration since impaction seems to be the factors predisposing to this transluminal migration.^{10 15} The median length of fish bone described to have transluminal migration is around 2.5–3 cms.^{1 10 15 16}

Four diverse cases have been included to convey that the foreign body can be lodged and missed in any of the locations of aerodigestive tract like nose, hypopharynx or even bronchus. Symptoms of foreign bodies in these sites can be subtle and non-specific until complication sets in. Foreign body in these regions can be missed, especially when no such history of insertion or ingestion is given by the patient or the attendant. Depending on the site of impaction and nature of the foreign body, they can go overlooked for quite a few weeks to months. The impacted fish bone can present as late as 9 months following ingestion.¹⁰ Since the risk of complication and long-term morbidity increases with the delay in removal, these foreign bodies should be removed at the earliest.¹⁵ Both the caretakers and the practitioners should have a high index of suspicion in any given case. At least a plain radiograph must be advised early in the course in all doubtful

Learning points

- ▶ Though encountered commonly, there is a tendency to overlook the possibility of a foreign body in the upper aerodigestive tract, especially when the history is not suspicious. Since the early diagnosis and the early removal of the foreign body prevent complications, one needs to consider 'these usual suspects' in the differential diagnosis even when there is no obvious history.
- ▶ Screening radiology can aid early diagnosis in the suspicious cases who otherwise are not responding to the conventional therapy. CT has certain intrinsic advantages compared with plain radiograph and should be the preferred choice for screening.
- ▶ Among various foreign bodies, the button battery can harbour the maximum damage at the site of lodgement.
- ▶ Of the various fish bones impacted at the upper digestive tract, those with sharp edges, having a length of more than 3 cm and/or impacted in a transverse plane at the site of lodgement have a higher likelihood of extraluminal migration and complication.

cases, to rule out any foreign body. However, the sensitivity of plain radiograph in detecting a foreign body like the fish bone is around 50%–55% whereas that of CT is 100%.^{12 17} According to the recent studies, drooling of saliva, accumulation of saliva in the pyriform sinus, pain are some of the clinical criteria which should mandate CT in suspected cases of the fish bone foreign body in aerodigestive tract.^{10 18} Besides, by asking for CT, many radiolucent foreign bodies can be diagnosed, which otherwise could be missed by plain radiograph. CT also helps in differentiating the foreign bodies from anatomical artefacts like calcified cartilages, vessels or ligaments appearing as a foreign body in plain radiographs.¹³

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