

Penetrating oesophageal foreign bodies in the thyroid gland

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Abstract

Oesophageal penetration and migration of oesophageal foreign bodies into the thyroid gland is extremely rare with only occasional case reports appearing in the medical literature over the years. This is a retrospective review of four patients who were managed for penetrating oesophageal foreign bodies in the thyroid gland over an 11-year period. The clinical, radiological and intra-operative findings of the four cases are discussed.

Key words: Foreign bodies; Oesophagus; Thyroid gland

Introduction

Foreign bodies that are ingested, either accidentally or intentionally, may pass through the gastrointestinal tract without sequel or remain in a segment of the gut. The outcome of such an event depends chiefly on the nature of the ingested foreign body – smooth and pliable ones being more likely to have uneventful transitions while those with sharp edges may embed in, or even penetrate, the gastrointestinal tract.

Oesophageal penetration with subsequent migration is a rare complication of foreign body ingestion. The presentation of such a condition is highly variable and dependent on the route of foreign body migration. Known complications of oesophageal foreign body migration include potentially fatal aorto-oesophageal fistula (Zhang *et al.*, 1996) and subclavian-oesophageal fistula (Loh and Tan, 1998) and retropharyngeal abscess (Singh *et al.*, 1997). Migrated oesophageal foreign bodies have also been reported to present as neck lumps (Lannigan *et al.*, 1988), unassuming skin granulations (Sethi and Stanley, 1992) and a discharging sinus (Gertner *et al.*, 1991).

This is a retrospective review of four patients who had been managed in the Singapore General Hospital over the last 11 years (1988 to 1998) for penetrating oesophageal foreign bodies in the thyroid gland. A summary of the four patients is shown in Table I.

Discussion

In a culture where meat, especially fish is commonly eaten unfileted, ingestion of bones, is not unusual. Rigid oesophagoscopies with removal of oesophageal foreign bodies are undertaken at a rate of 10 to 15 times a month in our centre; fish bones being the culprit in 85 per cent of the cases (Leong and Chan, 1987). Penetration and subsequent migration of oesophageal foreign bodies are generally uncommon (Nandi and Ong, 1978; Remsen *et al.*, 1983). Even more unusual are cases of penetrating oesophageal foreign bodies in the thyroid which have been reported sporadically in the literature over the years (Jemerin and Arnoff, 1949; Bendet *et al.*, 1992). This is a rare collection of cases that have been managed in our centre over 11 years.

TABLE I
SUMMARY OF PATIENT DATA

Case	Age/Race/Sex	Symptoms	Clinical findings	Plain lateral neck X-ray	CT scan neck	Rigid oesophagoscopy	Intra-operative findings	Type of foreign body
1	68/Malay/Female	Throat discomfort 4 days after fish-bone (FB) ingestion	Normal	Oblique opacity C4–C5 level	FB in right thyroid lobe	Normal	Minimal thyroid tissue reaction FB palpated in the right lobe of thyroid gland	3 cm lance-shaped fish bone
2	65/Chinese/Female	Throat discomfort 2 weeks after FB ingestion	Left thyroid mass	Oblique opacity C6 level	FB in left thyroid lobe	Not done	Fibrotic mass in the left lobe of thyroid encapsulating FB	3.5 cm lance-shaped fish bone
3	66/Chinese/Female	Throat discomfort and painful left neck swelling 7 weeks after FB ingestion	Left thyroid mass	Negative for FB	FB in left thyroid lobe	Puncture wound with granulation at the level of post-cricoid	Oedematous and inflamed left thyroid lobe encapsulating FB	2.5 cm lance-shaped fish bone
4	72/Chinese/Female	Throat discomfort and left neck swelling 1 week after FB ingestion	Left thyroid mass	Oblique opacity at C7 level	FB in left thyroid lobe	Normal	Left thyroid lobal abscess with FB embedded	2.5 cm lance-shaped fish bone

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FIG. 1

Plain lateral neck X-ray showing an obliquely placed opacity (arrows) traversing the oesophageal and tracheal shadow.

The four patients in this study were elderly ladies with dentures – a well-known risk factor – that greatly diminishes one's ability to detect abnormal oral intruders until the final pharyngeal phase of swallowing. All the patients sought medical advice for their persistent throat discomfort after ingesting fish bone between four and seven weeks previously. Three patients had palpable



FIG. 2

Axial CT scan of the neck showing the presence of a foreign body (arrow) in the right lobe of the thyroid gland.

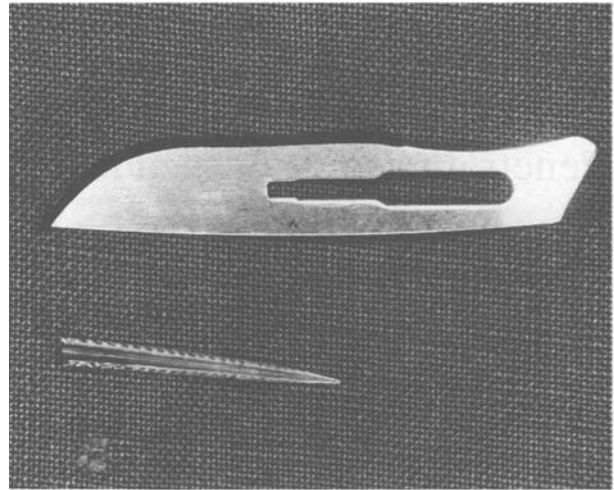


FIG. 3

A typical lance-shaped foreign body (fish bone) which can penetrate through tissue with ease, shown here with a size 10 disposable surgical blade.

unilateral thyroid masses but indirect laryngoscopy was unremarkable in all the patients. The presence of a thyroid mass undoubtedly corresponded to the extent of the thyroidal reaction that was observed intra-operatively. The patient who did not have any palpable neck mass was observed to have minimal inflammatory reaction within the thyroid gland during surgery – possibly due to the short length of time the foreign body was in the thyroid lobe.

A plain lateral neck X-ray is a very useful first line investigation in a patient suspected of having an oesophageal foreign body. Opacities of intraluminal oesophageal foreign bodies are sited within the central half of the oesophageal shadow while isolated opacities in the anterior and posterior quarters of the oesophageal shadow are mainly produced by tracheo-laryngeal calcifications and cervical vertebra osteophytes respectively. Unexplainable and unusually aligned oesophageal opacities that traverse beyond the oesophageal shadow boundary are highly suggestive of oesophageal penetration. With the exception of one patient who had a radiolucent foreign body, all the other three patients had obliquely placed opacities that traversed the oesophageal and tracheal shadows (Figure 1). Computed tomography (CT) scan of the neck (Figure 2) was done pre-operatively for all four patients and is regarded as a key investigation for three important reasons. Firstly, it confirms that an oesophageal foreign body has migrated – suggested by the presence of a suspicious opacity in the plain lateral neck X-ray and a negative rigid oesophagoscopy finding. Secondly, it provides the neck explorer with a 3-D impression of the foreign body's position and thirdly, with an estimated dimension of the foreign body. This data is vital as inadvertent breakage of foreign bodies sometimes occur during exploration and a second look may be mandated when the extradited foreign body is smaller than the one expected from radiological examination.

Exploration for migrated oesophageal foreign bodies in the thyroid gland is a challenging task that has often been likened to searching for a needle in a haystack. Usually palpation of the thyroid gland allowed identification of the involved region. Except for one case in which a partial lobectomy was necessary, the fish bones were identified and removed after careful splitting of the thyroid lobes. The damaged thyroid lobes were easily repaired with vicryl and drains were left post-operatively routinely. Recovery was uneventful in all the patients. Rigid oesophagoscopy

was undertaken in three patients but attempts to remove the foreign bodies were futile. Except for the demonstration of an oesophageal puncture wound in one patient, oesophagoscopy findings were generally unremarkable.

The rarity of involvement of the thyroid gland during oesophageal foreign body migration may be attributed to two important factors – (1) the high resistance of the anterior (trachea) and posterior (cervical vertebra) region of the oesophageal wall and (2) the extent of thyroid lobe 'coverage' laterally, particularly between the C4 to C7 level. The contraction of the cricopharyngeus muscle during swallowing probably plays a significant role in facilitating penetration of foreign bodies through the oesophagus at the thyroid level. The nature of foreign bodies also plays a role in determining whether oesophageal penetration will occur or not. All four patients in this study had hard pointed lance-shaped fish bones (Figure 3) of at least 2.5 cm in length, that presumably facilitated transmural oesophageal penetration and subsequent migration into the thyroid gland.

In conclusion, oesophageal foreign bodies penetrating the thyroid glands are rare complications of foreign body ingestion. Such an event should be suspected when a patient presents with an enlarging thyroid mass after foreign body ingestion. Although a plain lateral X-ray can often suggest oesophageal penetration, only a CT scan of the neck can demonstrate migration to the thyroid. Surgical removal of foreign bodies in the thyroid can be achieved with minimal tissue ablation and negligible morbidity.

References

- Bendet, E., Horowitz, Z., Heyman, Z., Faibel, M., Kronenberg, J. (1992) Migration of fishbone following penetration of the cervical esophagus presenting as a thyroid mass. *Auris Nasus Larynx* **19(3)**: 193–197.
- Gertner, R., Bar'el, E., Fradis, M., Podoshin, L. (1991) Unusual complications of an ingested foreign body. *Journal of Laryngology and Otology* **105**: 146–147.
- Jemerin, E. F., Arnoff, J. S. (1949) Foreign body in the thyroid following perforation of esophagus. *Surgery* **25**: 52–59.
- Lannigan, F. J., Newbegin, C. J. R., Terry, R. M. (1988) An unusual subcutaneous neck lump. *Journal of Laryngology and Otology* **102**: 385–386.
- Leong, H. K., Chan, R. K. C. (1987) Foreign bodies in the upper digestive tract. *Singapore Medical Journal* **28**: 162–165.
- Loh, K. S., Tan, K. K. (1998) Subclavian-esophageal fistula as a complication of foreign body ingestion: a case report. *Annals of the Academy of Medicine of Singapore* **27(2)**: 277–278.
- Nandi, P., Ong, G. B. (1978) Foreign body in the oesophagus: Review of 2394 cases. *British Journal of Surgery* **65**: 5–9.
- Remsen, K., Lawson, W., Biller, H. F., Som, M. K. (1983) Unusual presentations of penetrating foreign bodies of upper aerodigestive tract. *Annals of Otolaryngology and Laryngology* **105 (Suppl)**: 32–44.
- Sethi, D. S., Stanley, R. E. (1992) Migrating foreign bodies in the upper digestive tract. *Annals of the Academy of Medicine of Singapore* **21(3)**: 390–393.
- Singh, B., Kantu, M., Har-El, G., Lucente, F. E. (1997) Complications associated with 327 foreign bodies of the pharynx, larynx and esophagus. *Annals of Otolaryngology, Rhinology and Laryngology* **106(4)**: 301–304.
- Zhang, D., Zhang, R., Zhu, S. (1996) Surgical treatment of aortoesophageal fistula induced by foreign body in esophagus. *Chung Hua Wai Ko Tsa Chih* **34(10)**: 611–613.

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