

Multiple laryngeal foreign bodies composed of dried fish vertebral bones: a case report

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Abstract

We present a rare case of tracheostomy for removal of laryngeal foreign bodies consisting of three connected fish vertebral bones in a 15-month-old girl. Recent endoscopic techniques have made it possible to extract nearly all tracheobronchial foreign bodies with rigid bronchoscopes. However, the three connected foreign bodies in this report could not be extracted entirely by single endoscopy because the glottis as an exit was narrow due to severe oedema. Accordingly, tracheostomy was required to assist ventilation, prevent prolonged post-operative endotracheal intubation, remove the secondary tracheal foreign bodies and to provide a conduit for the introduction of a bronchoscope.

This suggests that tracheostomy should be considered to avoid the potential dangers of severe laryngeal oedema and to secure the route for removal of foreign bodies from the trachea when treating patients with multiple laryngeal foreign bodies and laryngeal oedema.

Key words: Larynx; Foreign Bodies; Tracheostomy; Laryngeal Oedema

Introduction

Inhaled foreign bodies most often lodge in the tracheobronchial trees, and laryngeal foreign bodies account for only 2–12.1 per cent of all foreign bodies in the airway.^{1–3} Multiple foreign bodies in the larynx are extremely rare.^{1–3} Foreign bodies in the airway can usually be removed by peroral endoscopy; however, on rare occasions, removal via a tracheostoma is required.⁴ We present a rare case of tracheostomy for removal of laryngeal foreign bodies consisting of three connected fish vertebral bones in a 15-month-old girl.

Case report

A 15-month-old girl experienced a cyanotic coughing spell and consecutive stridor while eating a dried horse mackerel. Radiographic examination in a local hospital showed three connected foreign bodies (vertebral bones) in the larynx (Figure 1). She was transferred to our institute where she was anaesthetized using a laryngeal mask airway in the operating room. Flexible fibre-optic laryngoscopy via the laryngeal mask airway during spontaneous breathing revealed that the upper part of the foreign bodies was lodged in the glottis with the spinal canal of the bone providing a narrow airway (Figure 2). Using a rigid, direct laryngoscope, an attempt was made to extract the three connected foreign bodies as a whole. However, they could not be extracted entirely by single endoscopy because the glottis as an exit was narrow due to severe oedema. After removing the proximal of the three bones, the remaining two vertebral bones disconnected and were therefore split into multiple fragments that consequently moved, resulting in tracheal foreign bodies. Because the glottic region was beginning to shut,

the rigid laryngoscopy was discontinued and a tracheostomy was performed with ventilation via the laryngeal mask. A flexible fibre-optic bronchoscope was then inserted via the tracheostoma and the remaining bones were easily removed using forceps along the side channel of the bronchoscope (Figure 3). The extracted foreign bodies were three vertebral bones of a dried horse mackerel (Figure 4). The largest one measured 11 mm × 5 mm × 4 mm. After removal, a tracheotomy tube was inserted. A post-operative chest radiograph taken in the operating room showed no foreign body residues. The child was administered intravenous decadron (0.3 mg/kg for two days) to prevent subglottic stenosis. Fibre-optic laryngeal examination performed six days after the operation showed no abnormalities and then the child was decannulated. She was discharged on the eleventh post-operative day. Her tracheostoma wound healed two weeks after decannulation. One year after removal of the foreign body, her condition was unremarkable without stridor or asphyxia.

Discussion

This report highlights the need for tracheostomy in the management of patients with multiple laryngeal foreign bodies and laryngeal oedema. Although the foreign bodies in this report were loosely connected when aspirated, they could not be extracted entirely in the first laryngoscopic attempt. As a result, the remaining foreign bodies, which ended up in the trachea, were removed separately. We could not find any other reported case similar to ours. Recent endoscopic techniques have made it possible to extract nearly all tracheobronchial foreign bodies with rigid bronchoscopes. However, tracheostomy is also needed in 2 per cent of airway foreign body cases.⁴

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FIG. 1

Radiographic image of the larynx showing three loosely connected foreign bodies in the subglottis (arrow).

Our case required tracheostomy for three main reasons: the first was for ventilation assistance due to laryngeal oedema caused by the foreign bodies themselves. Laryngeal oedema would be aggravated if further endoscopic removal was attempted. It would not only make endoscopic removal more difficult, but also result in a life-threatening condition. The second was to avoid prolonged post-operative endotracheal intubation and its related complications. If the patient was treated without tracheostomy, endotracheal intubation would be prolonged and also

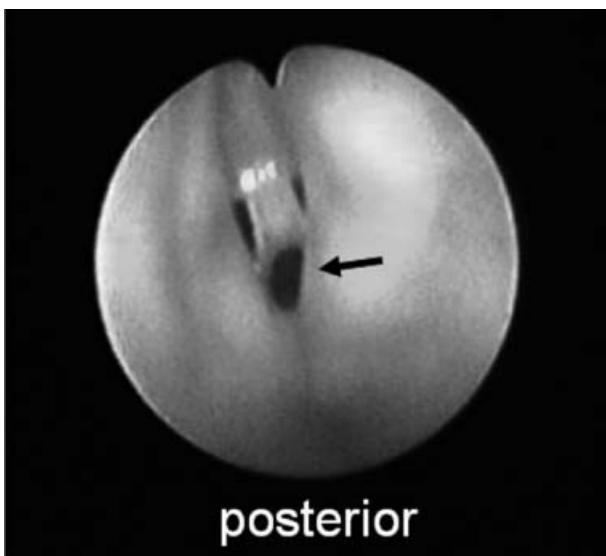


FIG. 2

Endoscopic view of the larynx showing the fish bones lodged in the glottis. Note the spinal canal of the bone, which acted as an available airway (arrow).



FIG. 3

A flexible bronchoscopic removal of the remaining bones. The remaining bone (black arrow) at the carina is being removed using forceps (white arrow) along the side channel of the bronchoscope.

result in severe complications including subglottic stenosis. The last was for a conduit for the introduction of a bronchoscope. A flexible fibre-optic approach via the tracheostoma, as indicated in this report, is suitable for the removal of foreign bodies in the trachea when laryngeal oedema coexists.

The foreign bodies in this report had another unique feature. The patient was able to breathe because the open canal of the foreign bodies provided an available airway. The glottis consists of two sections, an intermembranous and intercartilaginous section. The intercartilaginous section, referred to as the posterior glottis, is usually regarded as a respiratory glottis.⁵ In childhood, this section relative to the entire glottic area is greater than in adulthood.⁶ In our case, this section was completely obstructed by the vertebral bones. If the bones did not have an open spinal canal as a viable airway, it is likely we would not have been able to save her life.



FIG. 4

The multiple foreign bodies (vertebral bones of a dried horse mackerel) after removal. Note the spinal canal, which was continuous when aspirated (arrows).

- **This paper describes the case of multiple laryngeal foreign bodies in a 15-month-old child**
- **A tracheostomy was required as direct endoscopic removal was not possible**
- **The difficulties in managing such cases are discussed**

Conclusion

In cases of multiple laryngeal foreign bodies with laryngeal oedema, tracheostomy should be considered to avoid the potential dangers of severe laryngeal oedema and to secure the route for removal of foreign bodies from the trachea.

References

- 1 Rothmann BF, Boeckman CR. Foreign bodies in the larynx and tracheobronchial tree in children. A review of 225 cases. *Ann Otol Rhinol Laryngol* 1980;**89**:434–6
- 2 Cohen SR, Herbert WI, Lewis GB Jr, Geller KA. Foreign bodies in the airway. Five-year retrospective study with special reference to management. *Ann Otol Rhinol Laryngol* 1980;**89**:437–42
- 3 Lima JA. Laryngeal foreign bodies in children: a persistent, life-threatening problem. *Laryngoscope* 1989;**99**:415–20
- 4 Marks SC, Marsh BR, Dudgeon DL. Indications for open surgical removal of airway foreign bodies. *Ann Otol Rhinol Laryngol* 1993;**102**:690–4
- 5 Hirano M, Kurita S, Kiyokawa K, Sato K. Posterior glottis; Morphological study in excised human larynges. *Ann Otol Rhinol Laryngol* 1986;**95**:576–81
- 6 Hirano M, Sato K. *Histological Color Atlas of the Human Larynx*. San Diego: Singular Publishing Group, 1993

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