

Clinical Record

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Cite this article: Chen R, Koh J, Zhao YC, Pudel E. A piercing story: ingestion of a grill wire brush bristle. *J Laryngol Otol* 2021;**135**: 467–469. <https://doi.org/10.1017/S0022215121000694>

Accepted: 5 November 2020
First published online: 16 April 2021

Keywords:

Foreign Bodies; Otolaryngology;
Esophageal Perforation;
Retropharyngeal Abscess; Neck

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A piercing story: ingestion of a grill wire brush bristle

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Abstract

Background. This paper reports the dangers of an ingested metal wire bristle from a barbecue brush, which resulted in oesophageal perforation.

Case report. A 49-year-old gentleman presented to the emergency department with foreign body sensation and odynophagia after having consumed barbecued lamb for lunch. Computed tomography of the neck demonstrated a thin linear opacity near the thoracic inlet. The object could not be visualised on emergent rigid oesophagoscopy. Subsequent neck exploration enabled localisation of a retropharyngeal abscess and a thin wire bristle from a barbecue brush.

Conclusion. Always consider the utensils employed in food preparation as a differential in ingested foreign bodies. Thin wire objects have a high propensity to migrate and result in complications, hence urgent intervention is vital.

Introduction

Barbecue is a common and traditional cooking technique that enhances the flavour of food. Brushes are used to remove debris from previously cooked meals from the grill. However, metal bristles can dislodge from wire brushes and adhere to food subsequently prepared on the grill. The first documented case was in 1952 in a 19-year-old girl, with resulting oesophageal perforation.¹ This is not an uncommon presentation to emergency departments, and consumer protection committees have advised against wire bristle brushes internationally.² However, there is a paucity in the literature of reported cases for foreign bodies of this particular nature.

Case report

A healthy 49-year-old male presented to a regional hospital emergency department with odynophagia, in the context of having consumed barbecued lamb for lunch earlier that afternoon. He denied dysphagia, nausea or vomiting, chest or neck pain, or fever. The patient was given cola to drink and felt that the foreign body had passed; he was then discharged home.

Three days later, the patient went for an elective colonoscopy. As he still experienced the ongoing foreign body sensation, a concurrent gastroscopy was performed. However, this only demonstrated oesophagitis.

One week following the initial emergency department presentation, the patient re-presented with neck pain and a low-grade fever. There were no signs of a foreign body, or complications such as subcutaneous emphysema, on examination. Only C-reactive protein was elevated, at 62 mg/l; otherwise, biochemistry findings were unremarkable.

Given his history, a non-contrast computed tomography of the neck was subsequently ordered. This revealed a high density, linear foreign body at level of T1. It was thought to be within the oesophageal lumen but penetrated the wall into the paraoesophageal fat. This was associated with surrounding inflammatory changes (Figure 1). Empirical antibiotics (intravenous (IV) cefazolin and metronidazole), dexamethasone and IV proton pump inhibitor were commenced.

The patient was transferred to The Royal Melbourne Hospital overnight and consented for emergency rigid oesophagoscopy. The rigid oesophagoscope did not identify any foreign body intraluminally, but demonstrated localised oedema in the posterior oesophageal wall at the thoracic inlet.

The decision was made to proceed with an open neck exploration. Before incision, a 32 Fr oesophageal bougie was inserted. Intra-operative ultrasound was used to identify the foreign body. An abscess was encountered, drained and swabbed for microbiology. A thin 2 cm metallic wire was isolated deep in the root of the neck. It was found lateral to the oesophagus, posterior to the right laryngeal nerve, and medial to the common carotid artery and right lung apex in the prevertebral space (Figure 2). The presumed lamb bone was in fact a bristle from the barbecue brush. Washout of the neck with saline and hydrogen peroxide was completed prior to closure and the insertion of a neck drain.

The patient was commenced on nasogastric feeds and abstained from oral intake for the first week. Antibiotics were changed to piperacillin-tazobactam for broader coverage, and a tetanus booster immunisation was administered. Two sets of blood cultures were taken and remained negative. The pus swab cultured *Streptococcus mitis* and antibiotics were

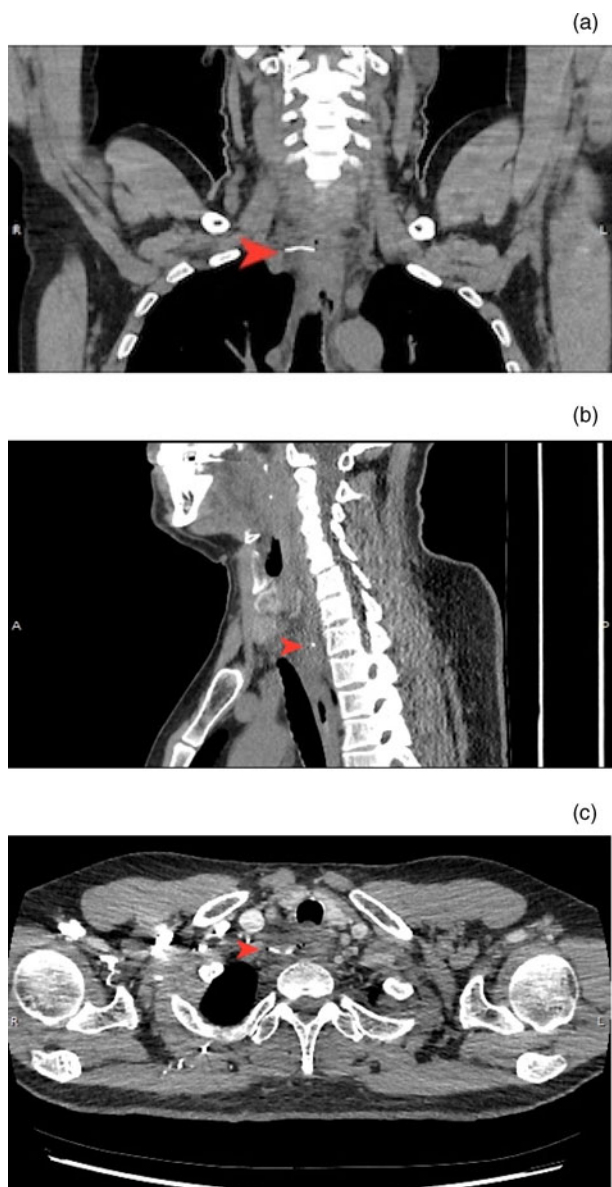


Fig. 1. (a) A coronal contrast computed tomography scan showing a radiopaque foreign body at the thoracic inlet. (b) A sagittal cut demonstrating the foreign body at the level of T1, presumed to be within the oesophagus lumen. (c) An axial view of the thin, curved foreign body, reported to be a bone. (Arrows indicate foreign body.)

downgraded to amoxicillin-clavulanate. A follow-up barium swallow confirmed no leakage from the oesophagus. The patient had a smooth recovery.

Discussion

Ingestion of wire bristles from grill brushes are frequent but can often be overlooked. This is because they present with non-specific symptoms, including odynophagia, globus sensation or throat pain. Further, not all patients will offer the pertinent detail of recent food consumption. This case emphasises that clinicians should always have a high index of suspicion of the utensils involved in food preparation. Whilst 80–90 per cent of ingested foreign bodies will pass spontaneously in the gastrointestinal tract,³ 10–20 per cent will require endoscopic retrieval, and less than 1 per cent will require operative management.⁴

Urgent retrieval of metal wire bristle should be performed to avoid complications. Its thin and sharp structure allows it to migrate quickly, and it accounts for up to 80 per cent of cervical perforations.⁵ Furthermore, oesophageal perforation

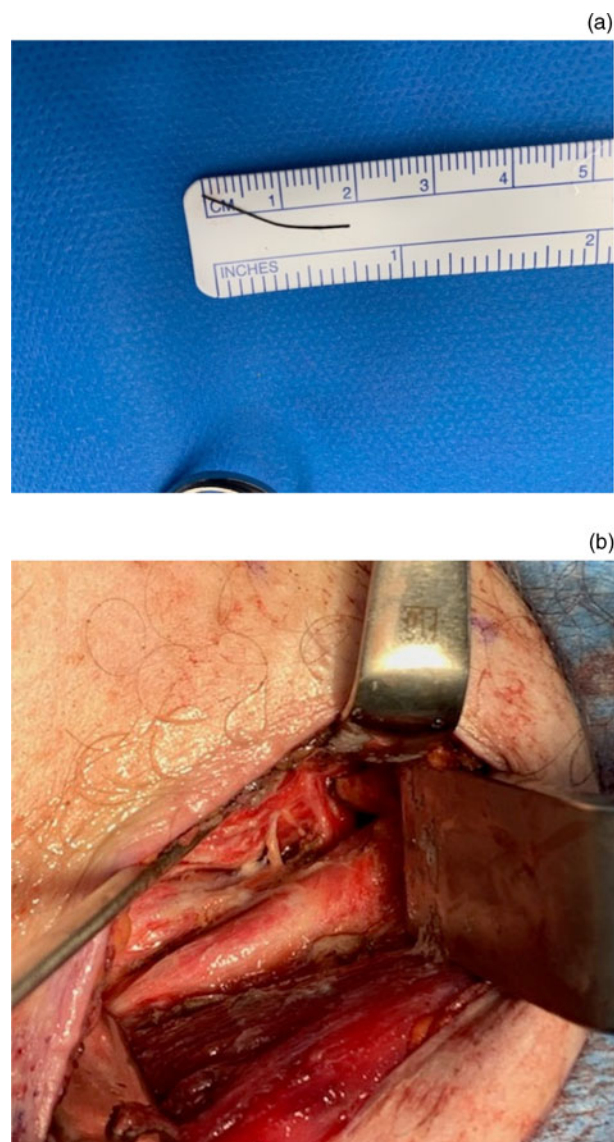


Fig. 2. (a) The ingested metal bristle from the barbecue brush after removal, measuring nearly 2 cm. (b) The wire bristle was found embedded precariously medial to the common carotid artery.

has a mortality rate that ranges between 10 and 20 per cent, and delay in treatment of more than 24 hours can result in doubling of the mortality rate.^{5,6} Fortunately, because of the timely removal, our patient was able to avoid further complications such as mediastinitis and vascular injury.⁷

Flexible endoscopy within 6 hours is recommended in the World Society of Emergency Surgery 2019 guidelines for the management of oesophageal emergencies.⁸ Wong *et al.* proposed an algorithm for the management of suspected brush bristle ingestions, which advocates surgical neck exploration if oesophagoscopy is unsuccessful.⁹ However, ensuring urgent extraction of the metal bristle is just one challenge the surgeon faces, as identifying the object intra-operatively is equally as difficult.

- Always have a high suspicion that a utensil (or part of it) involved in food preparation could be the ingested foreign body
- The inconspicuous symptomatology has resulted in many delayed diagnoses
- A protracted diagnosis, and sharper, narrower objects, increase the risk of complications such as perforation and abscess
- Ingestion of grill brush bristles warrants urgent action, by endoscopy or surgical intervention
- Intra-operative imaging such as ultrasound can aid identification when a foreign object cannot be visualised or palpated

Thin metal wires can be difficult to visualise, and intra-operative imaging can assist in locating the foreign body. It is important to use pre-operative imaging to determine the location of the foreign body in relation to other anatomical structures in the area. Imaging also targets the area of the neck that needs to be explored. However, pre-operative imaging may be inaccurate by the time the patient is being operated on. Moreover, it should be appreciated that patient positioning during pre-operative imaging may be different to that during the operation.¹⁰ This may affect the perceived location of the foreign body, and intra-operative imaging modalities may be required. Intra-operative radiographs are of limited utility because of the lack of bony landmarks around the area. However, intra-operative ultrasound has successfully guided surgeons in identifying the foreign body.¹¹

Conclusion

The persistent presentation of ingested grill wire bristles highlights the need for clinicians to be cognisant of this possibility, the associated complications and the requirement for urgent action. Stringent regulations should be instated to ensure manufacturers and retailers protect the public from their exposure. Herein, we recommend the use of non-wire bristle grill brushes to avoid this health hazard.

Acknowledgements. We would like to thank the patient described, for generously allowing us to share this story, and The Royal Melbourne Hospital ENT Department, for approving the manuscript for publication.

Competing interests. None declared

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