

Clinical Record

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Difficult oesophageal foreign body removal: a novel surgical approach to a complex situation

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Abstract

Background. Ingested foreign bodies pose a unique challenge in medical practice, especially when lodged in the oesophagus. While endoscopic retrieval is the standard treatment, certain cases require more innovative approaches.

Methods. This paper reports the case of a patient who intentionally ingested a butter knife that lodged in the thoracic oesophagus. After multiple endoscopic attempts, a lateral neck oesophagotomy, aided using a Hopkins rod camera and an improvised trochar as a protective port, was performed.

Results. The foreign body was successfully extracted without causing oesophageal perforation. The patient was made nil by mouth, with nasogastric feeding only until a swallow assessment after one week. The patient was discharged and recovered well.

Conclusion. This case illustrates a successful, innovative approach to removing a foreign body in a high-risk patient, highlighting the significance of adaptability in surgical practice. It emphasises the need for individualised approaches based on the patient's history, the nature and location of the foreign body, and associated risks.

Introduction

Foreign bodies in the oesophagus and stomach are medical emergencies, and their ingestion is usually unintentional, often involving children and occasionally adults. In rarer cases, ingestion is intentional and frequently associated with psychiatric conditions. Numerous methods have been developed for the extraction of foreign bodies from the upper gastrointestinal tract, utilising a variety of tools such as forceps, loops and baskets. However, certain challenging scenarios may preclude the removal of foreign bodies with standard flexible or rigid oesophagoscopes, necessitating innovative and unique techniques.

Case presentation

A patient aged in their twentieth decade presented to the emergency department after intentionally swallowing a metal butter knife approximately 7 hours prior. The patient had a history of self-harm, with multiple previous endoscopies, 17 laparotomies for foreign body removals and even a prior thoracotomy for a butter knife extraction.

Physical examination revealed severe central chest pain and nausea, but the patient was hemodynamically stable and without haematemesis.

Investigations

A plain film chest X-ray and contrast-enhanced computed tomography (CT) scan of the chest and abdomen showed a metallic object consistent with a knife lodged in the oesophagus, as seen in [Figures 1–3](#). The distal end of the knife was in the proximal stomach, extending inferiorly beyond the surrounding gastric wall. The knife likely displaced the gastric wall, but no free air was seen adjacent to it, indicating no perforation. The CT scan showed no free air around the oesophagus or elsewhere in the mediastinum or abdomen, and no intra-abdominal free fluid or collection was noted. Multiple linear metallic objects were observed in the anterior abdominal subcutis and right chest subcutis, indicative of the patient's prior self-harm episodes.

Treatment

The patient was promptly taken to the emergency theatre, where a multidisciplinary team, including ENT, gastroenterology and general surgery specialists, attempted the foreign body removal. Transoral flexible and rigid endoscopic retrieval was attempted by a senior head and neck consultant. Unfortunately, it was unsuccessful because of the knife's low and firmly lodged position, which made it difficult to reach the object transorally, and there was the risk of perforation upon retrieval. Moreover, smooth outlining of the object made it difficult to use graspers, snares or endoscopic forceps. Thus, the team opted for an



Figure 1. A 3D computed tomography reconstruction scan showing the foreign body in the oesophagus.

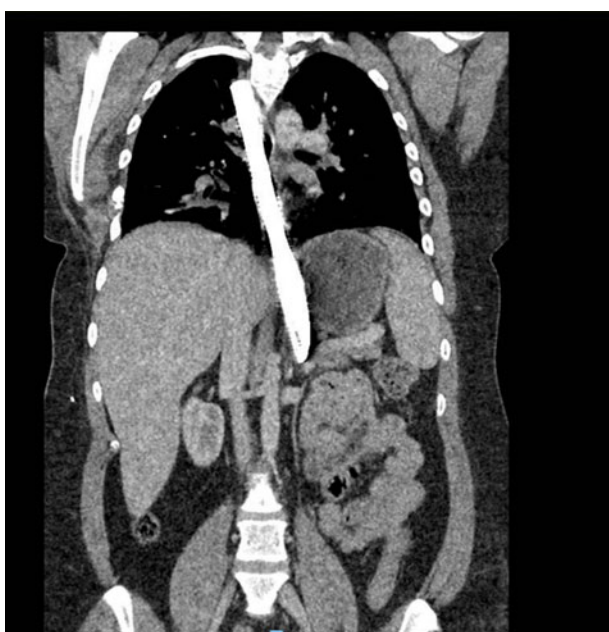


Figure 2. A computed tomography scan showing the foreign body in the oesophagus.

external approach via a lateral neck oesophagotomy, to avoid an open laparotomy and gastrotomy or even a further thoracotomy.

After placing a size 5 endotracheal tube in the oesophagus to act as a surgical landmark, an incision was made in the existing skin crease of the left lateral neck. Subplatysmal flaps were raised and the omohyoid muscle was dissected for access. The oesophagus was identified following thyroid mobilisation, and a vertical incision was made into the oesophagus, which was subsequently secured with stay sutures.

A unique aspect of this procedure involved improvisation: a size 3 laryngeal mask was cut and used as a port into the oesophagus, serving as a protective barrier (Figures 4–6).

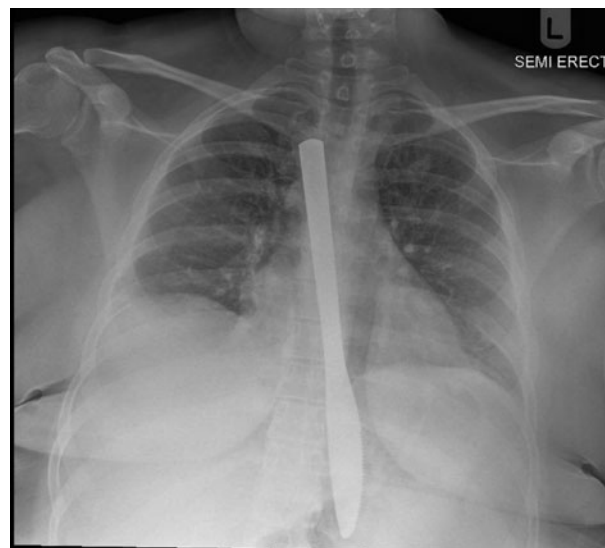


Figure 3. An X-ray showing the foreign body in the oesophagus. L = left

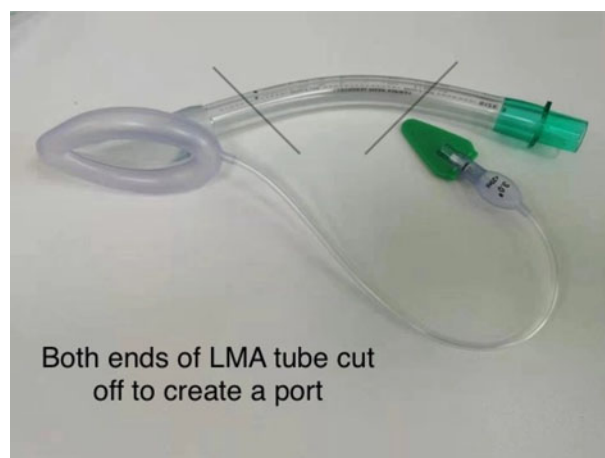


Figure 4. Schematic image illustrating how a size 3 laryngeal mask was cut to serve as a port into the oesophagus. LMA = laryngeal mask airway

A 0-degree Hopkins rod and suctioning were used through the port for direct visualisation during removal of the knife using a crocodile grasper. After successful removal, no oesophageal injury was detected. The oesophageal incision was closed with size 4-0 Vicryl interrupted sutures, and a nasogastric tube was inserted for feeding.

Outcome

The procedure was successful, and the foreign body was removed without causing oesophageal perforation. Post-operatively, the patient was placed on nil per os status with nasogastric tube feeding only. The following week, a Gastrografin® swallow assessment was performed and no leak was detected. The psychiatric team performed an assessment and will further review the patient in the community. The patient was discharged from the hospital following a successful procedure.

Discussion

Foreign bodies of the gastrointestinal tract are most common in children, peaking between six months and six years of

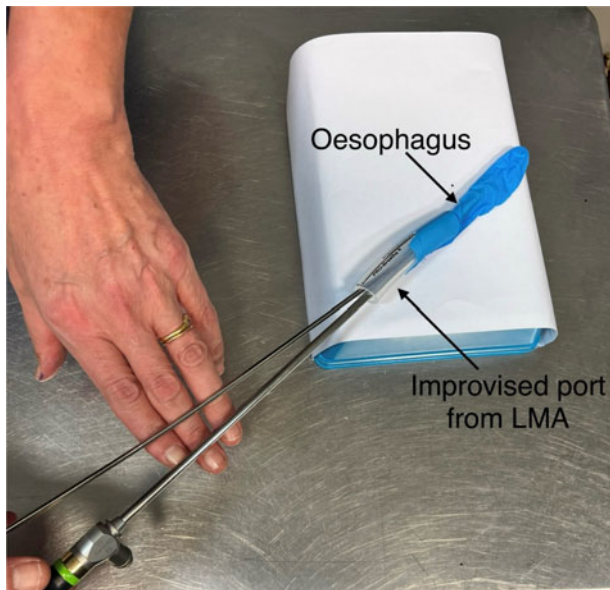


Figure 5. Schematic image illustrating the laryngeal mask being used as a port into the oesophagus. LMA = laryngeal mask airway

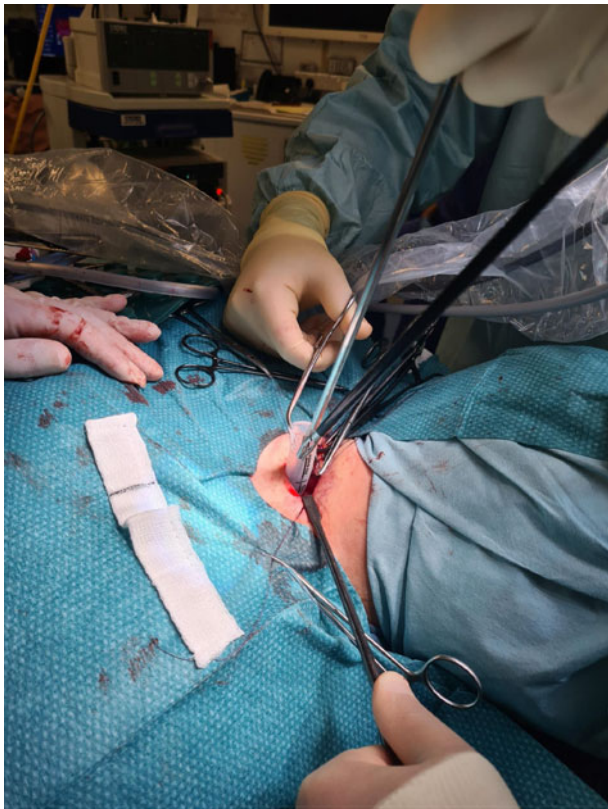


Figure 6. Intra-operative photograph of the size 3 laryngeal mask being used as a port into the oesophagus.

age.¹ However, adults with underlying oesophageal pathology, psychiatric illness and prisoners are considered high-risk groups.^{2,3}

Approximately 80 per cent of ingested foreign bodies pass naturally through the gastrointestinal tract. However, because of their size or shape, some may become lodged, most commonly at sites of physiological narrowing. In children, this typically occurs at the level of the cricopharyngeus muscle, while in adults, the lower oesophageal sphincter is the most frequent site of impaction.⁴ Around 20 per cent of lodged foreign

bodies are removed endoscopically, while open surgery is required in less than 1 per cent of cases.^{1,5}

Various removal techniques have been described in the literature. For blunt objects located in the proximal gastrointestinal tract, a Foley catheter can be passed below the object, its balloon inflated, and the foreign body removed while withdrawing the catheter. However, this method is contraindicated in patients with known oesophageal structural abnormalities, and in those with an uncertain or prolonged foreign body ingestion time. Another reported technique involves the use of an oesophageal bougie to advance smooth, round, low-risk objects down to the stomach, from where the foreign body will typically pass spontaneously.⁶

The 'gold standard' treatment for lodged or high-risk objects remains endoscopic removal, while flexible endoscopy is used primarily used for soft foreign bodies, such as food boluses, as well as objects located lower down in the gastrointestinal tract.⁷

There are reports in the literature of successful removal of large foreign bodies. For instance, a case described by Gulati *et al.* involved the accidental ingestion of a 19 cm long toothbrush, which was removed with a rigid oesophagoscope and alligator forceps under general anaesthesia.⁸ In another case reported by Hyun *et al.*, a large fish bone lodged near the upper oesophageal sphincter was removed using a cap-assisted colonoscope.⁹

The uniqueness of such cases lies in the shape and significant size of the foreign bodies, which prevents them from migrating beyond the duodenum. However, endoscopic extraction of such large and complex foreign bodies is not always successful, necessitating open surgery in some cases. In the case reported here, the patient was deemed high risk for laparotomy because of a history of 17 previous laparotomies. Rigid and flexible endoscopic removal was unsuccessful because the knife was firmly lodged low in the oesophagus.

- Endoscopic removal of foreign bodies remains the 'gold standard' treatment, with extensive surgery reserved for cases where endoscopic retrieval is unsuccessful or inappropriate
- This case illustrates the importance of adaptability and innovation in surgical practice
- The improvised technique facilitated safe removal of a foreign body and avoided a high-risk laparotomy or thoracotomy
- There are no tools that serve as a protective port into the oesophagus
- This procedure involved improvisation, where a size 3 laryngeal mask was cut and used as a port into the oesophagus, serving as a protective barrier
- A 0-degree Hopkins rod and suction were used for direct visualisation during removal using a crocodile grasper

The perforation rates following sharp foreign body ingestion were previously as high as 35 per cent. However, these rates have significantly decreased with the advent of advanced, modern techniques. The location of the foreign body plays an essential role in determining the risk of perforation, with the oesophagus, duodenum and ileocecal valve posing the highest risks.¹⁰

In our case, we managed to avoid oesophageal perforation by innovatively using a cut, size 3 laryngeal mask as a protective port into the oesophagus. This method allowed us to safely utilise multiple instruments in the oesophagus, while simultaneously protecting the organ. This improvised technique could be of significant value in similar complex scenarios, demonstrating the importance of adaptability and innovation in surgical practice.

Conclusion

The successful management of ingested foreign bodies requires a tailored approach, with consideration of the patient's history, the nature and location of the foreign body, and the associated risks. Endoscopic removal remains the gold standard treatment, with surgery reserved for cases where this is unsuccessful or inappropriate because of the patient's condition or the characteristics of the foreign body.

Our case illustrates the importance of adaptability and innovation in surgical practice, as demonstrated by our use of a cut laryngeal mask as a protective port into the oesophagus. This improvised technique facilitated the safe removal of the foreign body and protected the oesophagus from potential damage, avoiding the need for a high-risk laparotomy or thoracotomy.

We believe our case contributes to the literature by presenting a novel, successful approach to a complex situation, and we hope it can serve as a reference for clinicians dealing with similar challenging cases. Further research and case reports are required to refine these techniques, and to evaluate their effectiveness and safety in different clinical scenarios.

Competing interests. None declared

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