

An Improvised Method: Ingested Pin Extraction with Multiband Ligator Barrel

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Abstract

Children presenting with ingestion of pins is a common presentation encountered at large-volume endoscopic departments, with potentially serious complications such as perforation. We report the use of a naked multiband ligator barrel to safely remove an ingested pin from the proximal jejunum, in a 15-year-old child. Following successful removal of the foreign body, endoscopic examination of the esophagus, stomach, duodenum, and proximal jejunum did not show any signs of mucosal damage, ulceration, bleeding, or perforation. Here, we describe a simple, safe, cost-effective, and innovative technique for the endoscopic removal of pins.

Keywords: Endoscopy, foreign body, jejunum, pin

INTRODUCTION

Foreign body ingestion is a significant medical problem, often requiring invasive procedures for removal. Endoscopic removal of sharp foreign bodies can be technically challenging for the endoscopist and dangerous for the patient because of the risk of complications like gastrointestinal bleeding and perforation of the esophagus, stomach, and intestine if not retrieved at the right time.¹⁻³

In endoscopic procedures, the availability of commercial accessories such as caps, hoods, and overtubes is crucial to ensure the safety of the gastrointestinal tract and prevent complications during the retrieval of sharp foreign objects. However, in resource-limited settings, these devices may not always be suitable or accessible. As a solution, improvisation during endoscopy has emerged as a valuable approach to benefit both patients and endoscopists. Numerous instances have showcased the successful and ingenious use of handmade accessories, such as bottle nipples, gloves, condoms, and tubes, for the safe removal of sharp objects.⁴⁻⁷ This case study presents an unconventional approach to removing an ingested pin using a multiband ligator barrel, a cost-effective and safe alternative to conventional devices.

CASE PRESENTATION

A 15-year-old female presented to the emergency department 4 hours after pin ingestion. She was asymptomatic and hemodynamically stable, with unremarkable examination. Her radiograph of the abdomen suggested a linear foreign body, likely in the small intestines. Given the sharp foreign body ingestion, the patient was planned for urgent endoscopic retrieval under general anesthesia with CO₂ insufflation.

Upper gastrointestinal endoscopy (using the gastroscope Olympus GIF-H170) revealed a linear (4 cm long) foreign body with its sharp end embedded in the proximal jejunum (Figures 1 and 2). Due to the distant location of the foreign body, the gastroscope was withdrawn and further endoscopy was performed using an adult colonoscope (Olympus CF-Q150L). Initially, attempts were made to grasp the sharp end of the pin using rat-toothed and biopsy forceps; however, due to the narrow lumen of the jejunum, these attempts were unsuccessful. Hence, to get a clear view of the pin and to prevent mucosal trauma, a multiband ligation device barrel was fastened to the distal end of the gastroscope (Figure 3). The multiband ligation device barrel is made up of silicone, with internal and external diameters of 9 mm and 12 mm, respectively. The gastroscope was re-introduced, and the pin was grasped near its sharp end by non-spiked biopsy forceps and brought inside the lumen of the cap under endoscopic visualization (Figures 4 and 5). After that, the endoscope was withdrawn with continuous CO₂ insufflation, keeping the biopsy forceps in its position.

Informed written consent of the patient's guardian was obtained for this case report, as the patient was a minor (15 years old).

DISCUSSION

The use of a multiband ligator barrel for ingested foreign body removal offers several advantages. It is a cost-effective alternative to expensive endoscopic devices, making the procedure more accessible to healthcare facilities with limited resources. Additionally, the multiband ligator barrel

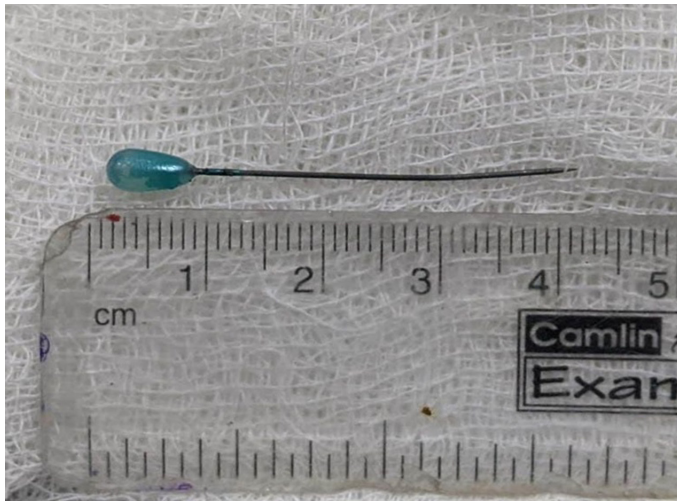


Figure 1. A 4-cm long pin with a plastic cap and sharp end.

is structurally robust, minimizing the risk of device malfunction.⁸ The transparent nature of the cap not only facilitates precise manipulation under endoscopic visualization but also enhances safety by preventing injury to the gastrointestinal mucosa during withdrawal. This underscores the importance of utilizing simple yet effective solutions to address complex clinical challenges, ultimately improving patient outcomes while minimizing expenses.

Our case highlights the innovative use of a specific device for endoscopic sharp foreign body extraction, filling a gap where traditional tools may be lacking or inaccessible. This not only expands the armamentarium for such procedures but also addresses potential challenges faced in resource-limited settings or with patients, like young children, who cannot tolerate standard equipment (large overtubes). Sharing such experiences is invaluable for advancing medical practice, particularly in areas where resources are constrained or specialized equipment may not be readily available.

While this approach is promising, it also has limitations. It is crucial to address the concern of inadvertent dislodgment of the improvised accessories, which could potentially introduce an additional foreign body into the stomach. This risk underscores the importance of ensuring the secure attachment and stability of the improvised tools to the gastroscop. Implementing additional safety measures, such as securing the barrel firmly to the gastroscop and regularly assessing its stability

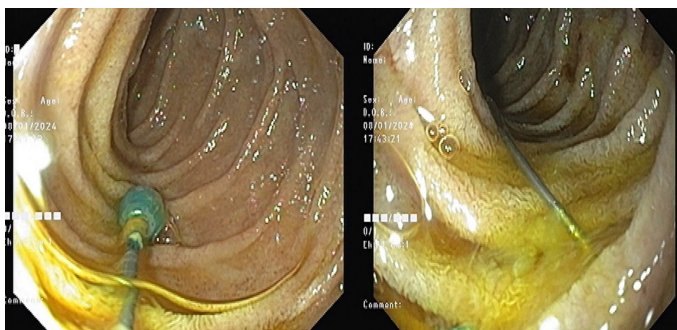


Figure 2. Pin lodged in the proximal jejunum.

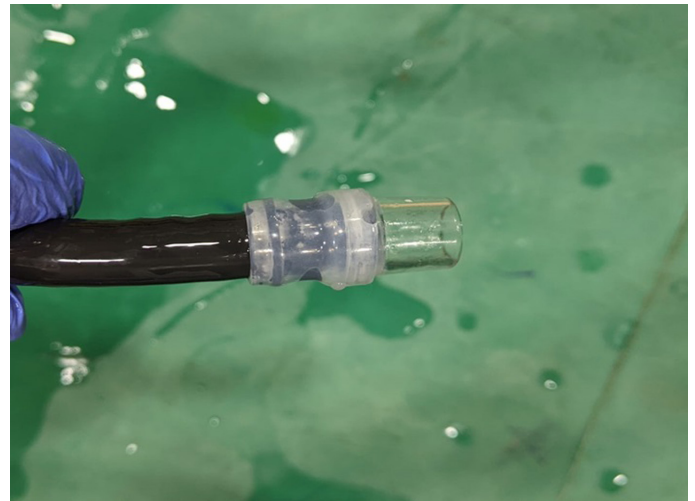


Figure 3. Naked multiband ligator barrel, fastened to the distal end of the gastroscop.

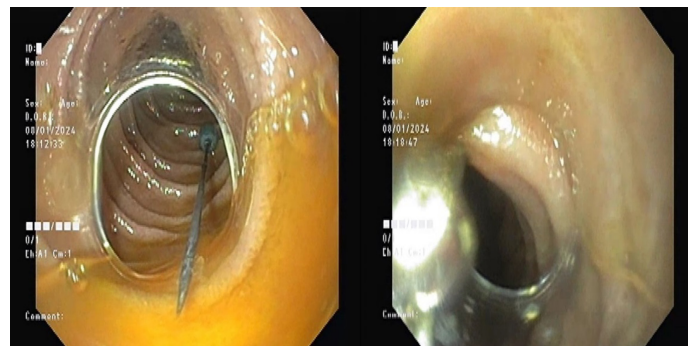


Figure 4. The sharp end of the pin safely grasped inside the barrel's lumen.

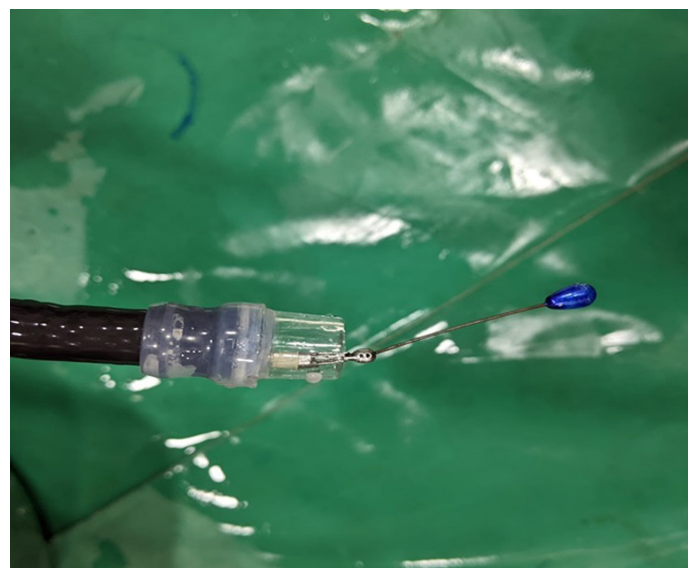


Figure 5. Demonstration of pin held by biopsy forceps inside band ligator barrel.

during the procedure, can help mitigate this risk and prevent further complications. Further research is needed to evaluate its efficacy for different types of foreign bodies and in diverse patient populations.

CONCLUSION

Due to its sleek design and wide visual field, the naked multiband ligator barrel is an easy, effective, and safe method for removing sharp foreign objects, such as pins.

Ethics Committee Approval: Not applicable.

Informed Consent: Written informed consent was obtained from patient's parents as the patient was a minor, who participated in this study.

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