

# Innovative Makeshift Technique for Removing Ingested Rare Earth Magnets

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Swallowing foreign bodies is common in pediatrics. However, ingestion of rare earth magnets, composed of a neodymium alloy with powerful attractive forces, pose unique risks to children. The attraction of the magnets to each other when positioned in separate areas of the intestinal tract can lead to bowel obstruction, perforation, fistula formation, or pressure necrosis. These significant complications have led NASPGHAN to offer guidance for their urgent removal in children. Upon medical presentation and determination of their position on x-ray, ingested magnets should be removed urgently before entering the small intestine to prevent severe adverse events.<sup>1,2</sup> However, endoscopic location and removal can be challenging especially if the child has not been in a fasting state. We present a makeshift technique for easily removing magnetic foreign bodies in such a scenario.

A 13-year-old patient accidentally swallowed several rare earth magnets. At presentation, the initial plain radiograph of the abdomen showed 8 magnets in a circular configuration projecting in the upper abdominal area (Fig. 1). An urgent upper gastrointestinal endoscopy was performed with endotracheal intubation.<sup>2</sup> Upon the endoscope entering the stomach, a large food bolus was present and no magnets were visible (Fig. 2). Despite extensive flushing and suctioning, the food debris could not be completely removed. The endoscope was removed and a single magnet from the same toy was secured in a Roth net and then reintroduced endoscopically (Figs. 3 and 4). The single magnet did not hinder the endoscopic vision. The force of attraction of the single magnet was strong enough to pull the ingested ring of magnets out of the bolus of undigested food. The resulting ring of all nine magnets was then successfully recovered (Fig. 5). The number of magnets retrieved completely matched the number accounted for on the x-ray. The patient tolerated the procedure without complications and was discharged home.

There are certain risks of this retrieval approach including attracting a more distal magnet or losing the magnets upon endoscopic removal. This should be taken into consideration when using this technique.

In summary, ingestion of multiple magnets within endoscopic reach warrants urgent removal even in asymptomatic patients. Nets are one of various retrieval devices. In this case, a makeshift technique of a prototype magnet in a net attracted the buried magnets within the food bolus and allowed successful retrieval of all intragastric magnets at once.

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**FIGURE 1.** Plain radiograph of the abdomen showing 8 radiopaque foreign bodies in the middle upper abdomen.

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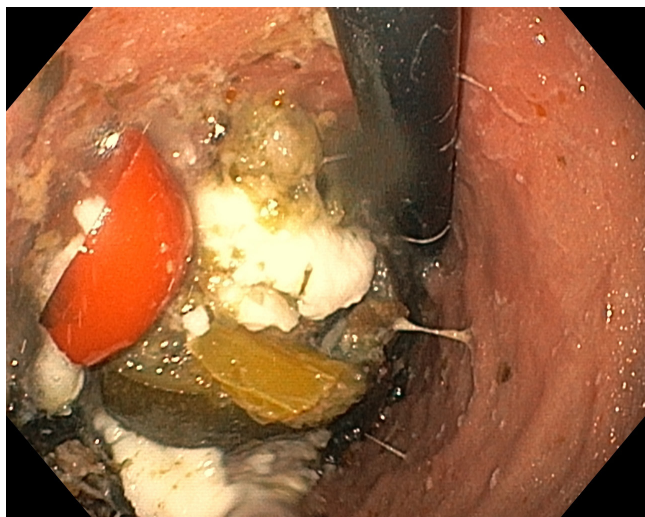
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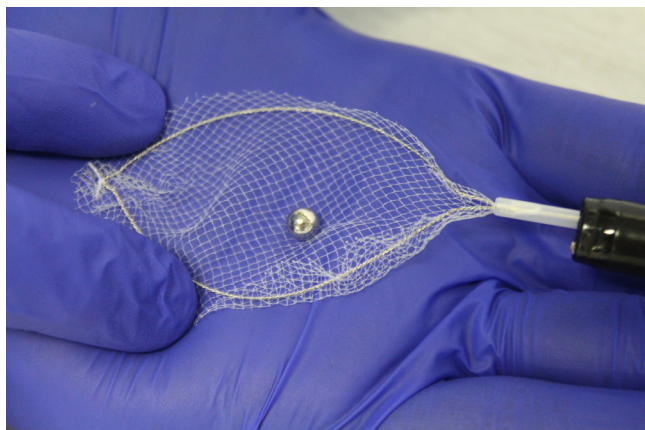
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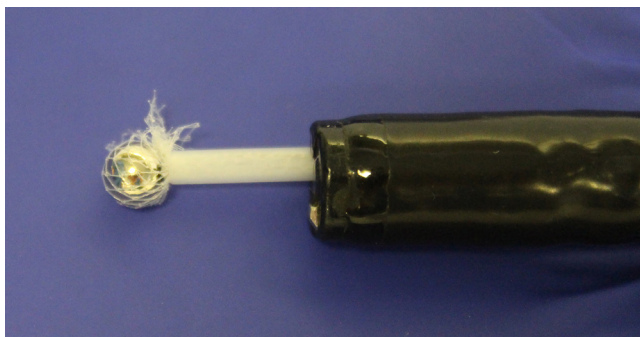
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**FIGURE 2.** Difficult localization of the foreign bodies in a postprandial stomach.



**FIGURE 3.** Securing the prototype earth magnet in a Roth net.



**FIGURE 4.** The magnet is securely enclosed in the Roth net.



**FIGURE 5.** Successfully recovered ring of all 9 magnets.