Endoscopic removal of an impacted root canal needle in the jejunum using double-balloon enteroscopy

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CASE REPORT

A 51-year-old man accidentally swallowed a root canal cleansing needle (21 mm and size 30 endodontic nickel titanium file with rubber dam) while undergoing dental work. The dentist noticed that he lost the needle while cleansing a root canal. Thus, he instructed the patient to tilt his head to the left and to spit the excess salivation and the needle into the receptacle. However, he accidentally swallowed the needle. The dentist instructed the patient to undergo radiographic examination, but he refused examination and follow-up. Instead, the patient began to ingest fruits and sauerkraut with the hope of naturally excreting the foreign body. Four weeks later, he presented to our hospital with periumbilical abdominal pain. On physical examination, the abdomen was soft with normal bowel sounds; however, there was tenderness on deep palpation in the supraumbilical quadrant. All of the laboratory test results were within reference ranges. A CT scan showed an impacted metal object in the upper jejunum (Fig. 1). After discussing the case with the surgeon and the patient, a decision was made to investigate the small bowel endoscopically. We initiated therapy with ciprofloxacin and metronidazole.

Small-bowel enteroscopy was performed (Fujinon EN-450T5; Fuji, Fujinon Corp, Japan). At approximately 40 cm from the pylorus, the impaled root canal needle was found (Fig. 2). The needle was grasped with a Dormia basket (Fig. 3). By performing a rightward torque of the enteroscope and pulling on the Dormia basket, the needle could be dislodged from the jejunal wall under direct endoscopic visualization. The enteroscope was pulled inside the overtube, but the needle, which hit the tip of the overtube, could not be dragged inside the overtube, and was bent like a boomerang by pulling the Dormia basket tightly in the aboral direction (Fig. 4). In this way, we speculated that the laceration potential of the needle tip would decrease as it would not encounter the jejunal mucosa at a 90-degree angle. Once inside the stomach, the needle was further bent (Fig. 5). Postremoval endoscopic inspection of the GI tract did not reveal any mucosal injuries (Fig. 6). Figure 7 shows the endoscopically extracted needle (Fig. 7). The patient remained stable, was able to tolerate the oral intake, and was discharged home 1 day later.

Figure 1. A CT scan of the abdomen documents the presence of a thin, sharp metal object in the middle jejunum. There is some local inflammatory reaction but no signs of free perforation or peritonitis.

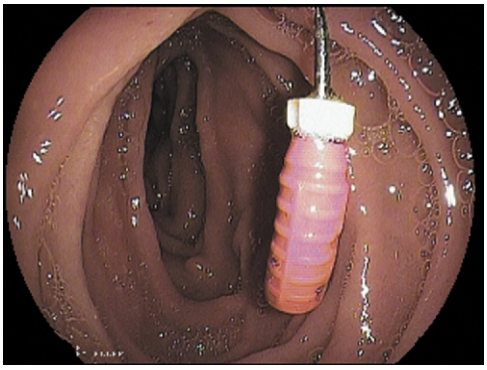

Figure 2. The impaled needle was found at approximately 40 cm from the pylorus. The needle had penetrated the small bowel and was firmly embedded.

DISCUSSION

Although most ingested foreign bodies are generally excreted without complications, large or sharp objects can result in significant complications such as bowel perforation and abscess.[1] Needles represent a particularly dangerous foreign body to the GI tract, generally mandating exploratory laparotomy for their removal.[2] However, endoscopic extraction of sharp or pointed objects from the luminal GI tract is feasible.[3]

Balloon enteroscopy has emerged as a valuable method for the investigation and treatment of small-bowel disorders, including retrieval of foreign bodies.[4] Most foreign bodies removed from the small bowel are retained capsule endoscopes. However, any small object can be potentially removed using balloon enteroscopy.[5,6] Our case report is

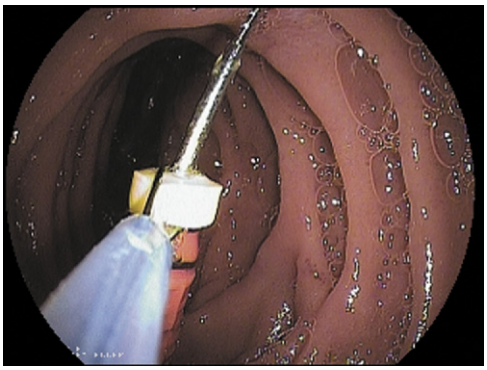

Figure 3. A Dormia basket was used to grasp the needle.

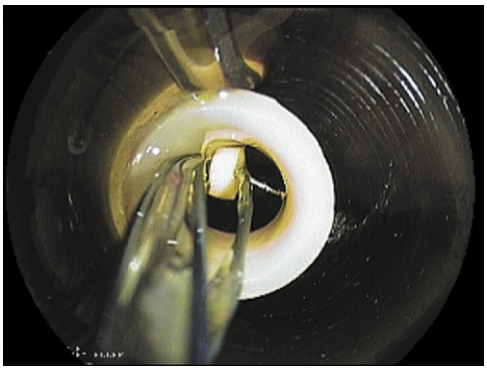

Figure 4. To decrease the laceration potential of the needle, the enteroscope was pulled inside of the overtube and the needle, which hit the tip of the overtube and was bent like a boomerang by pulling the Dormia basket tightly in the aboral direction.

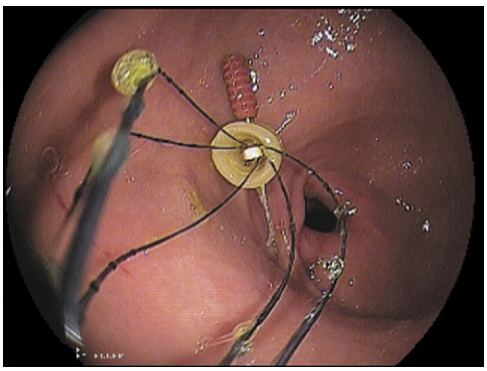

Figure 5. Once in the stomach, the needle was further bent, and we used the same technique to remove it through the esophageal lumen.

interesting for several reasons. First, we demonstrate that sharp, pointed objects can be removed endoscopically from the small bowel. Second, we provide a detailed technical description that may facilitate the reproduction of our findings. Third, our case adds to the expanding literature on therapeutic small-bowel endoscopy. Last, this case demonstrates how the clinical decision-making process in the setting of ingested foreign bodies needs to be individualized. In the absence of ongoing inflammation and significant abdominal pain, an interdisciplinary approach was taken, offering the endoscopic approach first, while having a bedside surgical backup in case the retrieval of the needle was unsuccessful.

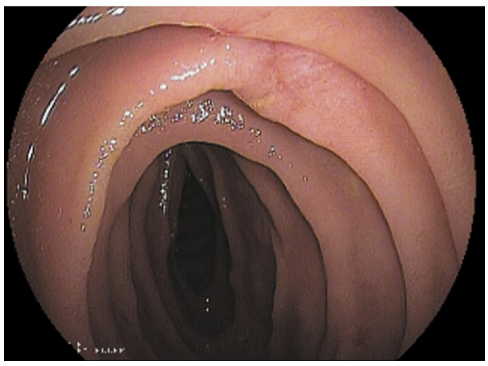

Figure 6. The jejunal impalement site was edematous with some fibrotic changes, but no significant inflammation.

Figure 7. Ex vivo photograph of the root canal cleansing needle.

DISCLOSURE

The following author disclosed a financial relationship relevant to this publication: K. Mönkemuller: speaker for Fujinon. The other authors disclosed no financial relationships relevant to this publication.

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