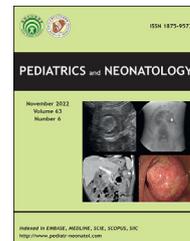


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Letter to the Editor

# Perforation of the Ascending Duodenum secondary to a tree branch ingestion in a child

To the Editor

The duodenum is not a common perforation site in cases secondary to foreign body ingestion, approximating 10% of cases according to published literature.<sup>1</sup> No reported cases of perforation at the fourth portion of the duodenum in children could be reviewed to date. Herein, we present a case of a toddler with duodenal perforation at the fourth portion secondary to tree branch ingestion.

A 1-year-and-3-month-old girl was presented with a sudden onset of abdominal distention and vomiting for the past 12 h. Upon arrival at our emergency department, the patient was feverish at 39 °C. Abdominal physical examination of the abdomen revealed abdominal tenderness to deep palpation and rebounding pain over the upper abdomen. The total white blood cell count was  $9.96 \times 10^9/L$ , and the C-reactive protein was 292.72 µg/mL. Abdominal radiography revealed marked small intestinal distension and Rigler sign, suggesting hollow organ perforation (Fig. 1a). Computed tomography showed pneumoperitoneum and mid-abdominal mechanical bowel obstruction.

An emergency operation was performed during which a tree branch could be seen perforating through the bowel (Fig. 1b). The site of the perforation was identified as the fourth portion of the duodenum, just before the ligament of Treitz. The tree branch, measuring 8-cm long, was removed and the perforation was repaired (Fig. 1c). No additional issue was identified and the surgical site was closed.

Histology confirmed the diagnosis of a perforated duodenum with abscess formation. Microscopic examination

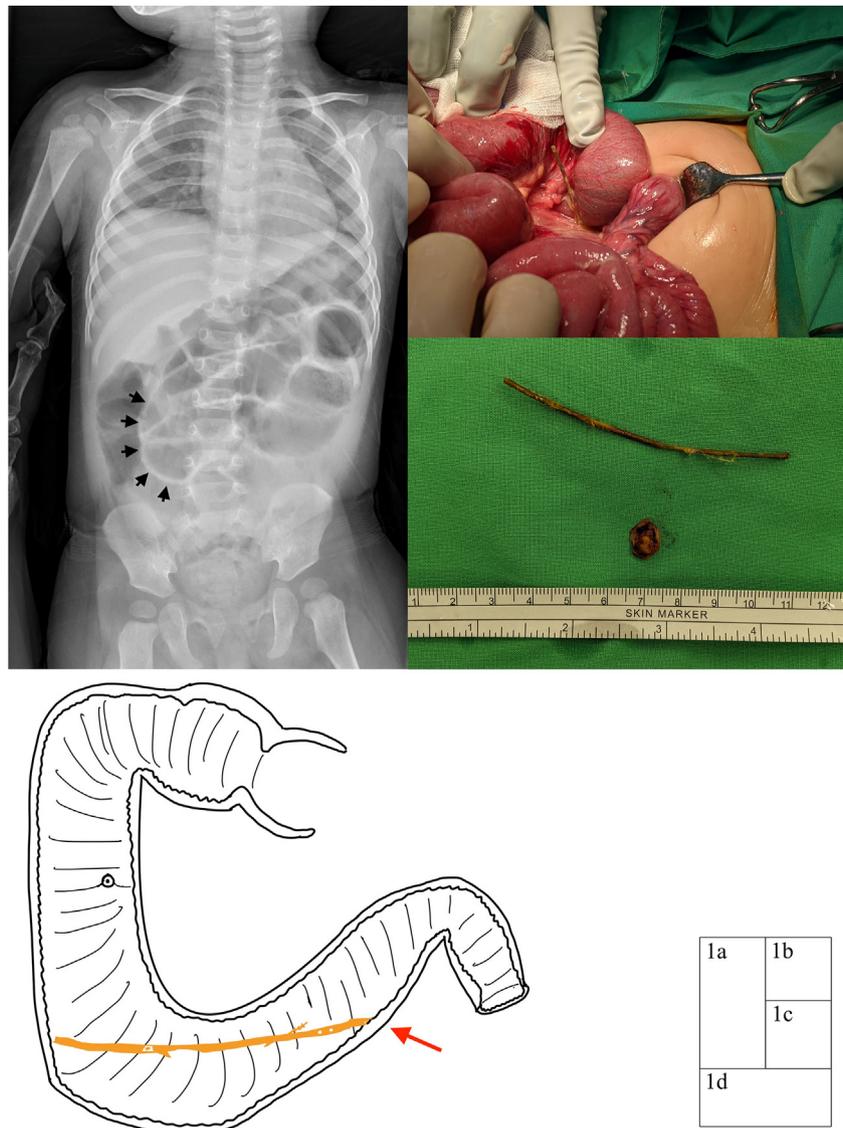
showed ulcerative intestinal mucosa with diffusely necrotizing inflammation, acute and chronic inflammatory cells transmurally infiltrating, and fibrinoid substance coating on the serosa. Meropenem and Teicoplanin were administered for 7 days due to a clinically septic state. The patient slowly recovered to a stable condition and was discharged 10 days postoperatively. The patient remained healthy without any sequelae on 1-year follow-up at our outpatient clinic.

Retrospective analysis showed that objects longer than 6 cm or thicker than 2 cm do not pass through the pylorus in adults, let alone in anatomically younger children<sup>2</sup>; however, cases of foreign body ingestions resulting in bowel impaction, with dimensions exceeding the limit, had been reported.<sup>3</sup> Most foreign body ingestion uneventfully passes, and <1% of cases require surgical intervention.<sup>3</sup> In the present case, the long strip of a foreign object passed through the pylorus and circumvent the duodenal flexure up to the point before the duodenojejunal flexure, remaining intact as a whole within the duodenum. Failed attempts for the foreign body to ascend the fourth portion of the duodenum by bowel peristalsis, along with a constant single-point of contact due to impaction, and the weight exerted upon the object on the tissue by gravity progressively resulted in pressure necrosis, which might be the pathogenesis that resulted in perforated duodenum at the fourth portion just before the ligament of Treitz (Fig. 1d).

To our best knowledge, this is the first case of perforated duodenum at the fourth portion secondary to foreign body ingestion in children.

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**Figure 1** a. Abdominal radiography revealed marked small intestinal distension and double wall sign (arrows), which suggested hollow organ perforation, b. A tree branch could be seen perforating through the intestine. The site of perforation was identified as the fourth portion of the duodenum, just before the ligament of Treitz. c. Tree branch and wedge duodenal resection. d. Failed attempts for the foreign body to ascend the fourth portion of the duodenum by bowel peristalsis, along with a constant single-point of contact due to impaction (arrows), and the weight exerted upon the object by gravity, progressively results in pressure necrosis, which may be the pathogenesis that results in perforated duodenum at the fourth portion just before the ligament of Treitz.

### Declaration of competing interest

None Declared.

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