

# Laparoscopic-assisted treatment for diospyrobezoar-induced intestinal obstruction after distal gastrectomy and cholecystectomy

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**SUMMARY** Diospyrobezoar is a relatively uncommon cause of small bowel obstruction. Here we report successful treatment in a patient with small bowel obstruction due to diospyrobezoar by laparoscopic-assisted surgery. A 93-year-old woman who had undergone distal gastrectomy and laparoscopic cholecystectomy presented with nausea and anorexia. An intestinal obstruction and an intestinal intraluminal mass were discovered on abdominal enhanced computed tomography. Following a transnasal ileus tube placement, the patient underwent laparoscopic surgery to remove the diospyrobezoar from the small intestine. The postoperative course of the patient was uneventful. Laparoscopic-assisted surgery following the transnasal ileus tube was beneficial for the patient's small bowel obstruction caused by diospyrobezoar.

**Keywords** diospyrobezoar, small bowel obstruction, laparoscopic-assisted surgery

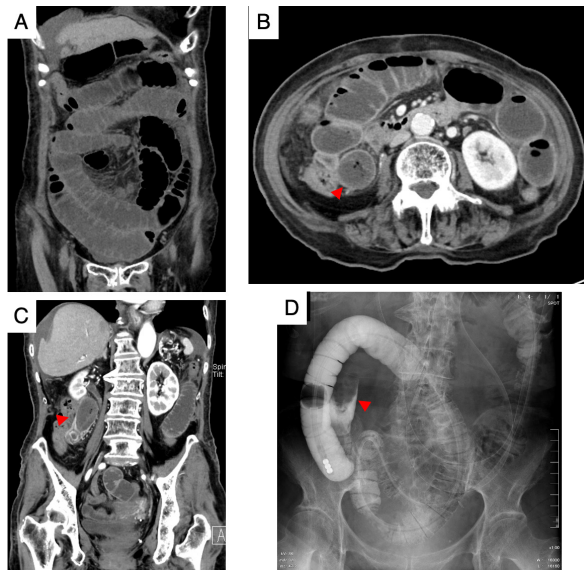
Letter to the Editor,

Bezoars are the most common gastrointestinal foreign bodies. Bezoars are classified into phytobezoars, trichobezoars, lactobezoars, mixed medication bezoars, and food bolus bezoars based on their composition (1-5). A diospyrobezoar is a type of phytobezoar caused by an excess of persimmons consumption that is difficult to treat due to its hard consistency (1-5). Small intestinal obstruction caused by a primary bezoar is uncommon and is usually caused by the migration of a gastric bezoar (2-5). Dissolution with Coca-Cola<sup>®</sup> removal with endoscopic devices, laparotomy, and laparoscopic surgery are currently available treatment options for an intestinal bezoar (3-5). Our report describes the successful laparoscopic-assisted treatment of a diospyrobezoar in the ileum following the placement of a transnasal ileus tube. It was thought that the diospyrobezoar migrated from the stomach.

In October, a 93-year-old woman with dementia presented to a clinic with nausea and anorexia. She had advanced dementia and was living with family members, but they were unable to fully manage her eating. She had been admitted to the local hospital and treated with conservative therapy for 10 days because she was suspected of having enteritis and subileus. She was

referred to our hospital because her symptom persisted. She had severe dementia and it was difficult to obtain sufficient information about her recent daily activities, including eating habits. According to her medical records, she had a Billroth I distal gastrectomy at the age of 74 and laparoscopic cholecystectomy at the age of 89. An intestinal obstruction and an intestinal intraluminal mass were discovered on abdominal enhanced computed tomography (Figures 1A, 1B, and 1C). As a result, she was suspected of having small bowel obstruction caused by a foreign body, such as food.

She had a transnasal ileus tube placed for proximal intestine drainage. Although the placement reduced intestinal dilatation, the bowel obstruction was not relieved. Three days after the ileus tube was placed, a contrast examination with Gastrografin<sup>®</sup> revealed a foreign body obstructing the intestinal tract to the ileus tube (Figure 1D). The body removal of the foreign body required surgery. The laparoscopic examination was attempted through two ports, one in the umbilicus and the other in the left abdomen. There was enough peritoneal space for laparoscopic movement because the ileus tube had previously decompressed the intestine (Figure 2A). The foreign body was easily identified in the distal ileum (Figure 2A), using the moving tip of



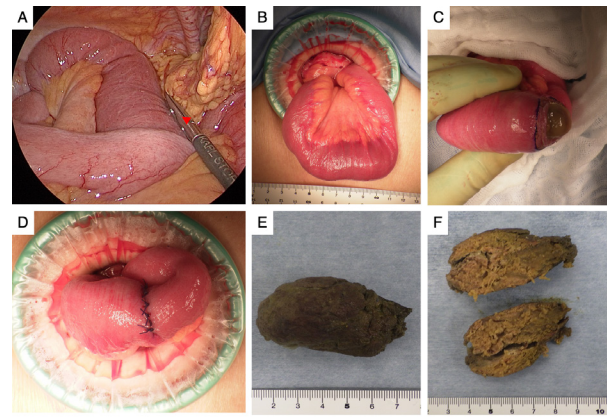
**Figure 1. Findings from an imaging study.** (A) Computed tomography scan reveals a small bowel obstruction. (B, C) Enhanced computed tomography reveals a foreign body obstructing the small bowel (red arrowhead). (D) Contrast examination revealed a foreign body obstructing the intestinal tract at the ileus tube's end (red arrowhead).

the transnasal ileus tube as a guide. The umbilical port site was then extended to a 4 cm incision to allow for the removal of the foreign body via an extracorporeal incision of the pulled-up ileum (Figures 2B, 2C, and 2D). The postoperative course went smoothly, and the patient was able to eat on the third postoperative day.

Bezoar extracted had a hard and fibrotic content (Figures 2E and 2F). Because component analysis revealed that this bezoar contained more than 98% tannin, the foreign body was classified as a diospyrobezoar.

Diospyrobezoar is an uncommon but occasionally reported cause of small bowel obstruction (2-5). Although the cause of the ileus was unknown before surgery in our case, the hybrid procedure combining laparoscopic examination after intestinal decompression and open surgery with a small incision was effective in removing the intraluminal foreign body.

Diospyrobezoar is an unknown cause of small bowel obstruction (2-5). Based on imaging studies alone, it is extremely difficult to determine that the cause of the small bowel obstruction is a diospyrobezoar (6,7). A diospyrobezoar in the small intestine cannot be removed using standard upper gastrointestinal endoscopy and must be removed using a double-balloon endoscopy. It is difficult to try the dissolution by Coca-Cola® without a confirmed diagnosis. Although small bowel obstruction limits the working space for laparoscopic surgery and makes findings foreign bodies difficult, the laparoscopic approach to small bowel obstruction is becoming more popular (8,9). We had enough working space because we performed the laparoscopic procedure after intestinal decompression with a transnasal ileus tube, and the foreign body was easily identified.



**Figure 2. Findings from operations.** The foreign body in the intestine was easily identified and extracted from the abdominal cavity (A, B) (red arrowhead). The foreign body was removed from the small intestine (C, D). (E, F) The appearance of the foreign body was removed.

Previous gastric surgery, persimmon consumption, and diabetes mellitus, among other things, are known risk factors for diospyrobezoar (1,3-5). She had previously had a distal gastrectomy. It was later revealed that she had harvested and eaten many persimmons from her garden before the outbreak. However, due to her advanced dementia, this critical information for the preoperative diagnosis could not be obtained. The post-gastrectomy state, possibly uncontrolled persimmon intake due to senile dementia, and the season with abundant persimmon in the rural area should all be considered for the diagnosis.

In conclusion, laparoscopic-assisted surgery of an intestinal diospyrobezoar with intentional decompression using a transnasal ileus tube is useful and can be applied to other intraluminal foreign bodies.

*Funding:* None.

*Conflict of interest:* The authors have no conflicts of interest to disclose.

*Informed consent:* Written informed consent was taken from the patient for the publication of case details and photographs.

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- Received February 8, 2023; Revised May 28, 2023; Accepted May 30, 2023.
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- Released online in J-STAGE as advance publication June 16, 2023.