Peritonitis with small intestinal perforation caused by a plastic bread bag clip: A case report

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ABSTRACT
INTRODUCTION: Cases of a foreign body ingestion often require surgical treatment due to perforation or penetration. There is a possibility that plastic bread bag clips also cause serious adverse events when they are ingested.

PRESENTATION OF A CASE: We report a rare case of peritonitis with small intestinal perforation caused by a plastic bread bag clip that needed surgical treatment. A 47-year-old man was taken to our hospital because of abdominal distension and vomiting. A computed tomography test demonstrated findings of small intestinal perforation, and a high-density object was seen in the jejunum. During emergency surgery, it was discovered that a plastic bread bag clip had caused the perforation.

DISCUSSION: Some cases of gastrointestinal tract perforation or bleeding due to the ingestion of bread bag clips have been reported overseas. Because bread bag clips are normally radiolucent, they are impossible to discover when accidentally ingested, so diagnosis is difficult unless the patient remembers the incident. The shape of plastic bread bag clips is unique and can result in a trap-like effect, which prevents easy removal once ingested.

CONCLUSION: Bread bag clips need caution in handling, and in cases of accidental ingestion, careful observations should be made to allow for removal within reach of upper GI endoscopy. The following case report has been reported in line with the SCARE criteria [1].

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1. Introduction
Cases of foreign body ingestion are often seen, and most foreign bodies pass through the gastrointestinal tract with no complications. However, there are some cases that need surgical treatment due to perforation or penetration [2]. Fish bones are said to be a major cause of gastrointestinal tract perforation caused by foreign body ingestion, amounting to 43.6% of causes [3]. We report a rare case of peritonitis with small intestinal perforation caused by plastic bread bag clip requiring surgical treatment with reference to relevant literature below. The following case report has been reported in line with the SCARE criteria [1].

2. Presentation of a case
A 47-year-old man was taken to our hospital because of abdominal distension and vomiting. He had a medical history of cerebral palsy and epilepsy, so he had been living in welfare facilities for the disabled from childhood. Because oral intake was impossible, he was fed by gastrostomy. His body temperature, blood pressure, heart rate, respiratory rate and SpO₂ were, 38.6 °C, 110/84 mmHg, 105/min, 24/min, and 93% (room air), respectively. He exhibited abdominal distension and hypo bowel sound, board-like abdomen, generalized abdominal tenderness with the strongest pain in the paraurumbilical area of the abdomen. The blood test showed an elevated white blood cell count (11.1 × 10³/μL) and CRP level (23.0 mg/dL). The lactate level was at a normal level (1.0 mmol/L). Computed tomography of the abdomen demonstrated intraperitoneal free air, as cited, and an increase in the density of the jejunal mesenterium. In addition a high-density object was seen in the jejunum (Figs. 1 and 2). Considering the circumstances, we diagnosed the patient as having panperitonitis with small intestinal perforation and emergency surgery was performed within that day. Upon laparotomy, there were muddy ascites and a perforated jejunum was found at 210 cm on the oral side from terminal...
Computed tomography of the abdomen demonstrated intraperitoneal free air, ascites, and an increasing in the density of the jejunal mesenterium, with a high-density object in the jejunum.

The bread clip became stuck in the intestinal mucosa as if it had bitten into the surface to cause the observed perforation.

Computed tomography colonography depicted the outline of the bread clip in the small intestine.

3. Discussion

Plastic bread bag clips are commonly used not only to seal bread bags, but also for interior decorating, and so on. From our research, there was only one reported case of gastrointestinal tract perforation caused by a bread bag clip in Japan [4], and no particular warning was issued. However, some cases of gastrointestinal tract perforation or bleeding due to the ingestion of bread bag clips have been reported overseas. Between the 1975 and the 2010s, there were 30 cases reported that diagnosed ingestion of bread bag clips in foreign countries [4–14].

Because plastic bread bag clips are normally radiolucent, they are impossible to discover when accidentally ingested, so diagnosis is difficult unless the patient remembers the incident. In this case, food residue that adhered to the bread bag clip had calcified and computed tomography clearly showed it as a high-density object allowing for the identification of gastrointestinal tract perforation due to a foreign body (although the object could not be identified as a bread bag clip). Recently some reports referred to usefulness of CT scan with 3D reconstruction to identify the bread bag clips [5,6]. Because of the calcification, it is suggested that a certain period of time had passed from the point of ingestion, but when and how the bread bag clip was ingested remain unknown. Generally speaking, most accidentally ingested foreign bodies pass through the gastrointestinal tract naturally, but approximately 10% require endoscopic removal, and approximately 1% require surgery. Sharp pointed objects like toothpicks, stiff wires, food impaction, superabsorbent objects, and objects over 6 cm should be manually removed when they are accidentally ingested [4,6]. The shape of plastic bread bag clips is unique and can result in a trap-like
Fig. 3. The bread clip became stuck in the intestinal mucosa as if it had bitten into the surface to cause the observed perforation.

Fig. 4. Food residue that adhered to the bread clip had calcified.

effect, which prevents easy removal once ingested [7]. There is a report of successful removal of a bread bag clip from the duodenum with biopsy forceps [8], but in cases where the clips reach the small intestine, retrieval is quite difficult.

Including the present case, 11 cases of small intestinal perforation, 1 case of colonic perforation, 1 case of esophageal perforation, 2 cases of small bowel obstruction, and 3 cases of gastrointestinal tract bleeding were diagnosed due to accidental ingestion of bread bag clips (sourced from Pubmed from the 1975 to 2010s) [4–14]. Among these cases, 3 postoperative deaths occurred after surgery for gastrointestinal tract perforation. As mentioned above, accidentally ingested foreign bodies should be immediately examined with upper GI endoscopic evaluation and removed because they could cause serious complications if left untreated. However, if foreign bodies exceed the reach of upper GI endoscopy, careful observation is needed. Plastic bread bag clips cannot be monitored by abdominal X-ray because of their radiolucency, so it is important to assess physical findings and symptoms more carefully after accidental ingestion. Examinations should be performed with consideration for surgery if there are symptoms or signs indicating a possibility of perforation or bleeding appear (e.g., high fever, abdominal pain, vomiting, and blood discharge).

4. Conclusions

We report a case of peritonitis with small intestinal perforation caused by a plastic bread bag clip, with literature review, and a cautionary warning. Bread bag clips need to be handled with extreme care, particularly in houses and facilities where young children, people with mental retardation, and/or elderly people with dementia live. Bread bag clips are generally recognized as useful tools around the world, so it is thought to be unacceptable to eliminate them. However, it can be argued that there is room for improvement regarding their designs and materials.
**Conflicts of interest**

There aren't any conflicts of interest.

**Sources of funding**

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**Ethical approval**

This is an observation case report, so no institutional review board approval is required.

**Consent**

Written informed consent was obtained from the next of kin for publication of this case report and accompanying images.

**Author contribution**

Ms Ema Mitsui: Data collection, data analysis, writing paper.
Mr Mototaka Inaba: Study design, data interpretation, revision of manuscript.
Mr Tetsushige Mimura: Revesion of manuscript.

**Registration of research studies**

The name of registry is as follows: Peritonitis with small intestinal perforation caused by a plastic bread bag clip: a case report. UIN is 4099.

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**Guarantor**

Mototaka Inaba.

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