

# Plastic bread-bag clips in the gastrointestinal tract: report of 5 cases and review of the literature

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## Abstract

PLASTIC BREAD-BAG CLIPS HAVE BEEN IDENTIFIED as a cause of local perforation or obstruction at many sites in the gastrointestinal tract. This study is the largest case series yet reported, consisting of 3 cases presenting as small-bowel perforation, 1 case in which the clip was found incidentally in the small bowel at laparotomy during vascular surgery and 1 case in which the clip was found incidentally in the small bowel at autopsy. In all cases there was no radiographic evidence to suggest a foreign body in the gastrointestinal tract. People older than 60 years of age who have either partial or full dentures seem to be particularly at risk for the accidental ingestion of these devices. If accidentally ingested, plastic bread-bag clips represent a significant health hazard. As the population ages, small-bowel perforation secondary to ingestion of such clips may occur with increasing frequency. The authors recommend elimination or redesign of the clips, to prevent their being swallowed and becoming impacted in the small bowel or to allow them to be identified in the gastrointestinal tract by conventional radiography.

Plastic bread-bag clips, which first appeared in the 1950s, are ubiquitous in industrialized society. Fifteen cases of a plastic bread-bag clip being found in the gastrointestinal tract have been reported previously<sup>1-9</sup> (Table 1). The mean age of the patients was 61 years (Table 1). In 5 of the 15 cases, the patient was edentulous; in the other 10 cases dental status was not stated. In most cases (11 of 15), the plastic bread-bag clip was found in the small bowel; other locations were the esophagus and the large bowel. Perforation of the small bowel occurred in 6 cases,<sup>3-5,8</sup> and perforation of the esophagus was reported in 1 case.<sup>5</sup> Most notably, 3 postoperative deaths occurred following resection related to a plastic bread-bag clip in the gastrointestinal tract.<sup>5</sup>

## Summary of new cases

At the London, Ont., teaching hospitals, we identified 5 cases of a plastic bread-bag clip being found in the gastrointestinal tract. The cases occurred over the period May 1991 to October 1998 and involved 3 men and 2 women with mean age of 65 years (Table 1). In 3 of the cases, the patients presented to the emergency department with a history of abdominal pain, nausea and vomiting. In these cases the results of physical examination and the radiographic findings were consistent with small-bowel obstruction. Perforated small bowel with peritonitis was found at laparotomy in all 3 cases, and pathologic examination revealed that the perforation was associated with a plastic bread-bag clip in the distal small bowel (Figs. 1a to 1e). A plastic bread-bag clip was also found incidentally at laparotomy during vascular surgery and in the distal small bowel at autopsy (Fig. 1f). In all of these cases radiographic examination yielded no evidence of a foreign body in the gastrointestinal tract. Four of the 5 patients had either full or partial dentures.

## Comments

These cases, combined with those previously reported (Table 1), suggest that people in their 60s who have either partial or full dentures (9 of the 10 patients for

## Review

## Synthèse

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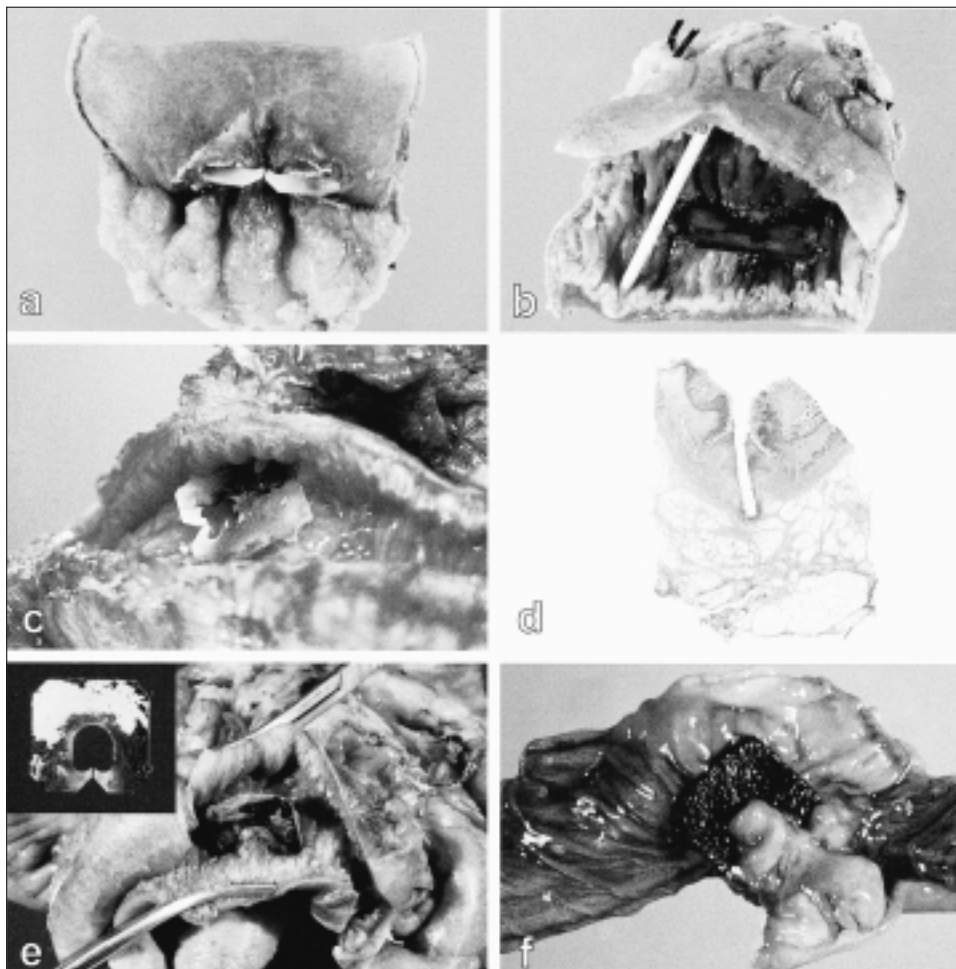
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whom dental status was known) are particularly at risk for accidentally swallowing plastic bread-bag clips. We postulate that decreased oral sensation associated with wearing dentures increases susceptibility to swallowing these devices. Data from the current series and the literature have not identified cognitive deficits or dementia as a factor in swallowing plastic bread-bag clips. The role of visual acuity in accidental ingestion of the clips is unknown.

For the 5 cases reported here and the 15 previously reported, the small bowel was the most common site of impaction (16 of the 20 cases, Table 1). We postulate that, once a segment of small-bowel mucosa has prolapsed into the clasp of the clip, the angled teeth of the clip operate as a one-way valve, trapping more of the bowel wall in the clip and preventing extrication. The impacted clip then slowly erodes through the bowel wall, which ultimately leads to perforation. We speculate that the small

bowel is the most common site of impaction because the width of the flat surface of the clips approximates the diameter of the small bowel, and because of the irregular folded nature of the small-bowel mucosa.

Aside from eliminating use of plastic bread-bag clips or using alternative closures, one strategy to prevent the swallowing of the clips would be to make them larger. We suggest that a larger clip taken into the mouth would more likely be identified as a foreign body before it was swallowed, irrespective of the person's dental status. Alternatively, we suggest that the shape of the clips be altered. Removal of sharp edges and alteration of the clasping mechanism might allow the clips to pass more freely through the gastrointestinal tract. Furthermore, if plastic bread-bag clips could be manufactured from an acid-digestible material, the problem of impaction and perforation could be almost entirely eliminated. All of the patients in this series underwent abdominal radiog-



**Fig. 1:** (a and b) Case 1. Serosal and mucosal surface respectively of resected small bowel, showing clasping mechanism of plastic bread-bag clip perforating the small-bowel wall. (c) Case 2. Mucosal surface of resected small bowel, showing impaction of free edge of plastic bread-bag clip. (d) Case 2. Whole mount of site of perforation. (e) Case 3. Site of impaction of plastic bread-bag clip. Inset: Clip after removal of encrusted bile salts; identifying ink marks on the clip have disappeared. (f) Case 5. Site of impaction of plastic bread-bag clip in the small bowel, as found at autopsy.

**Table 1: Characteristics of 20 patients in whom a plastic bread-bag clip was found in the gastrointestinal tract (1975 to 1998)**

Series	Sex; no. of patients		Mean age (and SD), yr	Site of impaction; no. of patients (and no. presenting with perforation)			No. of deaths
	Men	Women		Esophagus	Small bowel	Large bowel	
Literature <sup>1-9</sup>	9	6	61 (12)	3 (1)	11 (5)	1 (0)	3
UWO*	3	2	65 (8)	0	5 (3)	0	0
Total	12	8	63 (11)	3 (1)	16 (8)	1 (0)	3

Note: SD = standard deviation.

\*University of Western Ontario, 1991 to 1998 (cases presented in this paper).

raphy, but the plastic clips were not identified. Although Guindi and colleagues<sup>7</sup> reported that on close examination these devices could be seen with conventional radiography, others have not found this to be so.<sup>1-6,8,9</sup> If plastic bread-bag clips were made of a radiopaque material, they could be readily identified on routine radiographic examination. Identification of a clip before surgery might limit the extent of surgical resection required.

As our population ages, there may be a significant rise in the frequency of bowel perforation secondary to ingestion of plastic bread-bag clips. To prevent further morbidity and mortality, we recommend elimination or redesign of these clips. We also aim to increase the general awareness of physicians and the public of the potential danger of these ubiquitous devices.

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## References

1. Medline AN, Shin D. Unusual cause of small bowel obstruction [letter]. *CMAJ* 1975;113:608.
2. Jamison MH, Davis RWW, MacLennan I. A plastic bread-bag clip — cause of intermittent intestinal obstruction. *Br J Clin Pract* 1983;37:402-3.
3. Rivron RP, Jones DRB. A hazard of modern life [letter]. *Lancet* 1983;2:334.
4. Bundred NJ, Blackie RAS, Kingsnorth AN, Eremin O. Hidden dangers of sliced bread. *BMJ (Clin Res Ed)* 1984;288:1723-4.
5. Sutton G. Hidden dangers of sliced bread [letter]. *BMJ* 1984;288:1995.
6. McKaigney J, Cole M, Simon JB. Picking up the tab: obstruction of the gastrointestinal tract by plastic bread bag clips [letter]. *Gastrointest Endosc* 1985;31:112-3.
7. Guindi MM, Troster MM, Walley VM. Three cases of an unusual foreign body in small bowel. *Gastrointest Radiol* 1987;12:240-2.
8. Ellul JP, Hodgkinson PD. Problems with a plastic bread-bag clip [letter]. *Arch Emerg Med* 1989;6:156-7.
9. Norrie MWA, Chapman G, Connor SJ. A case of upper gastrointestinal bleeding secondary to a bread bag clip [letter]. *Aust N Z J Med* 1997;27:75.

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