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## International Journal of Surgery Case Reports

journal homepage: [www.casereports.com](http://www.casereports.com)

# An unusual case of duodenal perforation caused by a blister pack: A case report and literature review

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## ARTICLE INFO

## Article history:

Received 22 April 2015

Received in revised form 17 July 2015

Accepted 18 July 2015

Available online 28 July 2015

## Keywords:

Duodenal perforation

Foreign body

Blister pack

Retroperitoneum abscess

## ABSTRACT

**INTRODUCTION:** Ingestion of foreign bodies is a relatively common clinical problem. Blister packs have been known to be a causative agent of gastrointestinal perforation. We report a rare case of duodenal perforation caused by a blister pack, which was complicated by retroperitoneal abscess and having a poor outcome.

**PRESENTATION OF CASE:** A 72 year-old man with a history of dementia presented to the emergency department with a 2-day history of backache. Upon radiological findings, perforated peptic ulcer was suspected. However, emergency laparotomy revealed a blister pack protruding from the posterior wall of the third portion of the duodenum. It was complicated by a widespread retroperitoneal abscess. After removal of the foreign body, the perforation was treated with primary suture repair and an omental patch. However, the patient died two days after operation due to sepsis.

**DISCUSSION:** According to a literature review, the ileum is the most common site of perforation caused by blister packs. To our knowledge, duodenal perforations have not been documented to date. Curative treatment often involves emergent surgery. However, duodenal perforation in the third portion may lead to retroperitoneal abscess, which can result in severe sepsis and have a poor outcome. As there is no consensus about an ideal surgical approach, retroperitoneal abscess is one of the clinical challenges for surgeons. Even with prompt management, duodenal perforation may become fatal.

**CONCLUSION:** Unnoticed ingestion of blister packs can cause duodenal perforation. Although prompt management is necessary, duodenal perforation, especially in the third portion, may be potentially fatal.

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## 1. Introduction

Ingestion of foreign bodies is a relatively common clinical problem. Most of these ingested foreign bodies pass through the gastrointestinal tract uneventfully; however, in a small proportion of cases (<1%) complications such as perforation occur [1]. Blister packs have been known to be a causative agent of gastrointestinal perforation. While the esophagus and small bowel are the most commonly involved sites, duodenal perforations have not been documented to date. Here, we report a rare case of duodenal perforation caused by a blister pack, which was complicated by widespread retroperitoneal abscess and had a poor outcome. The aim of this report is to demonstrate its unusual presentation and difficulty in management, followed by literature review.

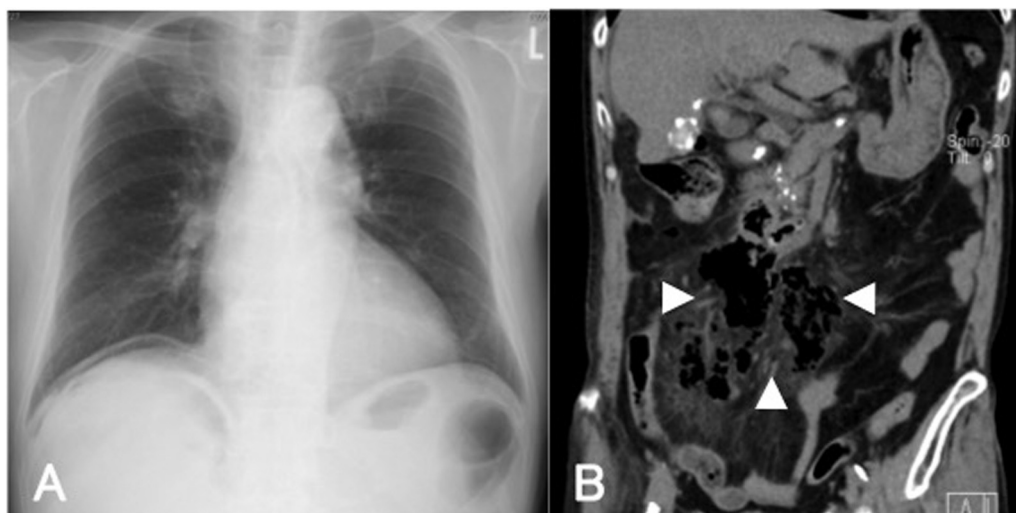
## 2. Presentation of case

A 72-year-old man with a history of dementia, insulin-dependent diabetes mellitus and chronic renal failure on hemodialysis presented to the emergency department with a 2-day history of backache. Two days ago, he experienced a sudden backache during hemodialysis. The symptom got worse and a high-grade fever emerged. His vital signs on presentation were as follows: blood pressure, 90/50 mm Hg; heart rate, 90 beats per minute; and body temperature, 38.5°C. Physical examination showed mild back pain and epigastric tenderness without sign of irritation. Laboratory tests showed pH of 7.282, base excess of -6.1 mmol/L, lactate of 49.1 mg/dL, white blood cell count of 12,000/mm<sup>3</sup> and C-reactive protein level of 42.6 mg/dL. Plain radiography of the abdomen showed free intraperitoneal air under the right diaphragm (Fig. 1A). A contrast-enhanced abdominal computed tomography (CT) scan revealed widespread pneumoretroperitoneum (Fig. 1B). Mottled air density and blurred periduodenal fat planes with streaky soft tissue stranding were observed around the third portion of the duodenum. With these findings, a preliminary diagnosis of duodenum perforation with retroperitoneal abscess was made and an emergency laparotomy

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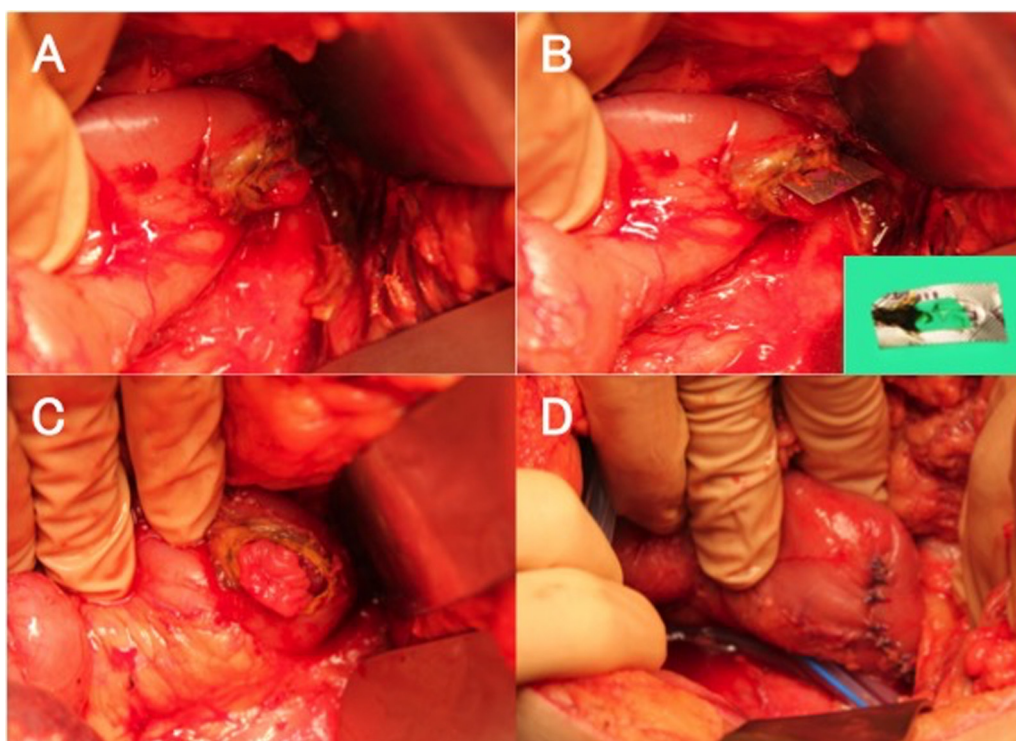
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**Fig. 1.** Preoperative radiological findings.

(A) Radiography showed free intraperitoneal air under the right diaphragm.  
 (B) CT revealed widespread pneumoretroperitoneum (arrow heads).



**Fig. 2.** Intraoperative findings.

(A) A perforation was detected at the posterior wall of the third portion of duodenum.  
 (B) A 25 mm × 15 mm blister pack was protruding from the lumen.  
 (C) After foreign body removal, 3-cm laceration was observed.  
 (D) Primary suture repair was performed, followed by omental patch and peritoneal lavage.

was performed. At this time, a duodenal ulcer was suspected as the underlying cause. After Kocher's maneuver, a massive foul-smelling abscess was observed in the retroperitoneal cavity. A perforation site was found in the third portion of duodenum. Inside the lumen, a foreign body was confirmed. A 25 mm × 15 mm blister pack was protruding from the posterior wall, resulting in a 3-cm laceration. After removal, a primary two-layer suture repair and omental patch were performed, followed by peritoneal lavage. Two abdominal drains were placed at retroperitoneal cavity nearby the suture site. Intraoperative findings are summarized in Fig. 2.

Retrospective review of preoperative CT revealed a linear opacity in the duodenal lumen (Fig. 3). The patient may have ingested the blister pack unknowingly. For infection control, intravenous broad-spectrum carbapenem antibiotics were used. The blood culture was positive for *Klebsiella planticola*. The abdominal pus culture was positive for *Klebsiella planticola*, *Streptococcus agalactiae*, and *Enterococcus faecalis*. As hypotension had prolonged, intravenous catecholamine administration was started. Continuous hemodialysis was also started after operation due to progressive acidosis and hyperkalemia. Fluid removal was impossible because

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