



Intra-jejunal migration with intestinal obstruction and perforation after gastric banding: A case report[☆]

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ABSTRACT

Background: Laparoscopic adjustable gastric banding (LAGB) is an approved procedure in bariatric surgery. However, serious complications due to band erosion have been reported. There have been few reports of intestinal obstruction and perforation caused by gastric banding invading the gastric wall and migrating to the jejunum. **Case introduction:** A 56-year-old man was admitted to our hospital with right lower abdominal pain ten years after LAGB surgery. An intraoperative gastric band showed erosion of the gastric wall and movement down to the jejunum, resulting in intestinal obstruction and jejunal perforation. **Conclusion:** Patients should undergo regular outpatient gastroscopic follow-up after gastric band surgery to prevent serious complications.

1. Introduction

1.1. Background

At the end of the 1870s, Wilkinson [1] et al. invented an adjustable bandage made of polypropylene mesh, which was placed in the upper part of the stomach through open surgery to restrict the intake of patients with obesity to achieve the goal of losing weight. With the progress in science and technology, the study found that the silicone band showed the least adhesion and tissue rejection, and the subcutaneous pump achieved adjustable purposes. Belachew introduced the laparoscopic technology in 1993 to make the operation more minimally invasive [2]. These advances make a LAGB gradually become mainstream in bariatric metabolic surgery. Although the short-term weight-loss effect of laparoscopic gastric banding is acceptable, it varies significantly among individuals [3]. Some patients fail to lose weight or have complications, such as band erosion, slippage, prolapse, connecting tube blockage, and leakage. These factors can lead to a significant reduction in adjustable gastric band surgery [4]. According to statistics, approximately 50–80 % of

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patients with an adjustable gastric band require band removal [5]. Gastric band migration is a common intragastric migration, while jejunal, ileal, and colorectal migrations are rare [6,7]. A case of intestinal obstruction and perforation caused by gastric wall erosion and migration to the jejunum ten years after LAGB in our hospital was reported. The banding eroded the gastric wall and migrated to the jejunum, causing intestinal obstruction and perforation of intestinal obstruction.

2. Case introduction

The patient was a 56-year-old male who had undergone an LAGB at our hospital ten years ago. One month ago, he experienced pain in the right lower abdomen, accompanied by nausea and vomiting. The vomitus included the stomach contents and bile, without chills, high fever, or other symptoms. As the above symptoms did not improve significantly after treatment in the local hospital, and the abdominal pain did not worsen, the patient visited our outpatient clinic and was admitted to the hospital. The patient's preoperative weight was 127 kg. The patient underwent LAGB in 2011. Three months postoperatively, the patient's weight decreased to 95 kg. Five months previously, the patient's weight had increased to 118 kg due to changes in eating habits (increased food intake and speed). One month earlier, the patient had lost 23 kg because of abdominal pain and poor appetite. During the physical examination, it was found that there was localized tenderness and rebound pain in the right lower abdomen, no obvious muscle tension, active bowel sounds, and the sound of gas passing through the water could be heard. The vital signs, including body temperature, heart rate, blood pressure, and breathing were stable. Routine blood tests showed an increase in white blood cells (15.3×10^9), neutrophils (13.25×10^9), and C-reactive protein (190 mg/L), suggesting that the infection was severe. An albumin level of 24 g/L indicates that the nutritional status is poor and postoperative complications, such as anastomotic leakage can easily occur. There were no obvious abnormalities in the renal function or coagulation test results.

Plain abdominal radiography indicated free gas under the right diaphragm, and digestive tract perforation was considered. The abdominal plain film also showed that the dilated upper jejunum was a "spring sign"; thus, intestinal obstruction was considered. Abdominal CT showed scattered pneumatosis in the abdominal cavity, and the intestinal wall was thickened. Dense tubular shadows were observed in the narrow lumen. Combined with the above situation, the patient chose delayed rather than prompt diagnostic laparoscopic surgery. Gastrointestinal decompression, anti-infection therapy, nutritional support, and other treatments were initiated after admission. On day 7 after admission, routine white blood cells, neutrophils, and other inflammatory indicators were completely normal. A re-examination CT showed that the free gas was completely absorbed, the dilated jejunum was flat with liquid and gas, and an irregular, dense shadow was visible in the thickened cavity of the proximal jejunum wall. Examination of the upper digestive tract showed constriction of the junction of the gastric fundus and body, an increased annular density shadow in front of the ilium in the right lower abdomen, and dilation of the duodenum and proximal jejunum (Fig. 1).

Laparoscopic exploration was performed after preoperative assessment and preparation. During the surgical procedure, the omentum at the gastric perforation site was wrapped and adhered to the abdominal wall to form a sinus tract. The connecting tube of the gastric-band water-injection pump was placed in the sinus tract. Intraoperative gastroscopy revealed penetration of the connecting line at the gastric corner, leading to the pylorus (Fig. 2). After the sinus tract was transected, the connecting tube was removed, the sinus tract was clamped using an absorbable clip, and the gastric fistula was closed using an absorbable suture. The right middle abdominal intestine 50–60 cm away from the ligament of Treitz, was attached together and tightly adhered to the anterior abdominal wall. The gastric band was embedded in the intestine, the proximal small intestine was dilated, and the distal intestine appeared

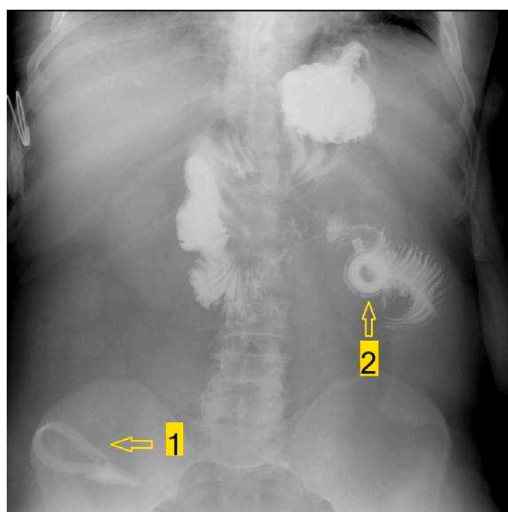


Fig. 1. Preoperative upper gastrointestinal radiography

Note: 1. The lower-left corner of the figure shows the migrated gastric band; 2. The right side of the figure shows the subcutaneous water injection pump.



Fig. 2. During the operation, gastroscopy was able to find the connecting tube that eroded and passed through the stomach angle.

normal. Two jejunal perforations were visible when the adhered and wrapped intestines were separated (Fig. 3). Therefore, a small incision was made in the middle of the navel to remove the incarcerated gastric band and jejunum with perforation. A lateral anastomosis was also performed. The intestinal segment was removed, and the gastric and connecting tubes were intact (Fig. 4). The patient recovered well after surgery, and no complications, such as anastomotic leakage, occurred.

3. Discussion and conclusion

We report a case of intestinal obstruction and perforation caused by erosion of the gastric wall and migration of the gastric band to the jejunum ten years after LAGB. In this case, we emphasise the importance of regular endoscopic follow-ups after LAGB.

LAGB is a common bariatric surgery; however, the long-term postoperative results vary widely. It is a minimally invasive bariatric surgery; however, its reintervention rate is high [8]. The common complications after LAGB surgery include gastric sac dilatation, banding erosion, intolerance, gastric leakage, and slippage, among which the incidence of banding erosion is between 0.04 % and 4.6 %, according to the follow-up period [9,10]. Gastric band erosion in the early postoperative period may be due to a serosal tear at the dorsal side of the cardia caused by separating the tunnel after the stomach and the hook device pulling the band when the band was installed during the operation, leading to erosion, migration, and even perforation of the band in the early period [11]. Gastric band erosion in the later stage may be due to micro-perforation caused by the physiological movement of the gastric wall and the chronic shear stress between the gastric wall bands, micro-ischaemic lesions caused by chronic hyperaemia and oedema, and infection caused by microperforation [12]. Another factor may be that the patient's food intake is excessively restricted and the gastric band is excessively filled, resulting in increased pressure between the gastric band and the gastric wall [13]. The fourth mechanism of gastric band erosion and migration may be related to the recognition of the gastric band as a foreign body by the immune system, which generates a rejection reaction to the silicon band, thus, leading to erosion [14]. However, the causes of gastric band erosion are complex and involve several factors.

Clinically, migration after gastric band erosion can manifest as persistent nausea, abdominal pain, abdominal fullness, loss, and weight gain. Hematemesis, intestinal obstruction, intestinal perforation, and peritonitis may occur in severe cases. The main diagnostic

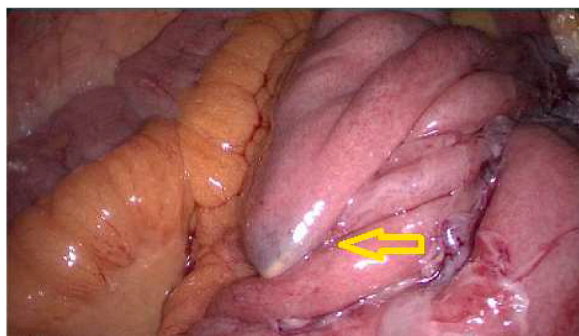


Fig. 3. Intraoperative laparoscopic exploration. Note: The right middle abdominal intestine, 50–60 cm from the ligament of Treitz, was adhered to a mass and tightly attached to the anterior abdominal wall; incarceration of the gastric band could be observed in the intestine.



Fig. 4. Surgical resection of the intestinal segment and gastric band removed. Notes: ① The intestinal segment was surgically removed, and the gastric band was embedded in the intestine ② The intestinal segment was surgically removed. ③ The gastric band corroded by the digestive juice was removed.

approach for gastric band erosion and migration is to find the eroded site through endoscopy and then confirm the migrated site through abdominal CT [15]. After the erosion of the gastric wall, the gastric band may migrate to a distant digestive tract, usually within the stomach. There have also been case reports of migration to the small intestine or colon causing intestinal obstruction or perforation [16] or even cases of migration of the gastric band to the rectum [17].

The treatment and timing of erosive migration of gastric banding have been different. The gastric band can be surgically or endoscopically removed, including laparotomy and laparoscopic surgery. In 1998, it was reported that the gastric band could be removed via laparotomy [18]. With the increasing maturity of laparoscopic techniques, laparoscopic gastric band removal reduces the incidence

of postoperative abdominal adhesions, which provides the possibility for later revision surgery, and has gradually become the primary surgical method for gastric band removal [19]. In addition, the laparoscopic removal of gastric banding has been advocated for patients with severe complications, such as intestinal obstruction and intestinal perforation. However, endoscopic techniques have made it possible to cut the band in the gastric cavity, break it into several parts, and remove it via an endoscope to reduce surgical trauma. The migration of the retained bands without obstruction may require long-term dynamic endoscopic follow-up without immediate surgery until endoscopic removal is possible [20].

In this case, the clinical symptoms and imaging findings of severe complications, such as intestinal obstruction and peritonitis caused by digestive tract perforation, appeared preoperatively. The diagnoses of intestinal obstruction and perforation were confirmed during surgery. After laparoscopic exploration and isolation of the incarcerated intestinal canal, a small incision was made on the umbilicus for enterotomy, and the band was removed entirely to avoid other injuries as much as possible.

In conclusion, we summarise our experience in preventing severe complications, such as intestinal obstruction and perforation caused by intestinal migration due to erosion of the gastric banding after surgery. First, after surgery, patients should develop good eating habits, regularly and quantitatively eat digestible food, eat fewer and more meals, and chew slowly. Second, clinical symptoms should be observed after surgery. Timely medical treatment should be sought in cases of continuous nausea, abdominal pain, disappearance of abdominal fullness, weight gain, or hematemesis. Finally, regular outpatient follow-ups should be conducted, such as at one month, three months, six months, and a year after the operation, and outpatient check-ups should be performed once a year, supposing that the patient can follow up with the gastroscope regularly according to the doctor's advice after the operation. In such cases, the gastric band can be removed under endoscopic guidance after the gastric wall has been eroded by the band, which is less traumatic than surgical treatment. Therefore, endoscopy is recommended for patients with regular band erosion.

However, this study lacked postoperative follow-up data. Long-term postoperative follow-ups of patients should be performed and recorded in future studies.

Ethics approval and consent to participate

This study was reviewed and approved by the Ethical Research Committee of the People's Hospital of Xinjiang Uyghur Autonomous Region, Urumqi (Approval no.2020041007). Informed consent was obtained from all patients for the publication of their clinical data.

Data availability statement

No data was used for the research described in the article.

CRediT authorship contribution statement

A.I.K.E.B.A.I.E.R. Aili: Writing – original draft, Methodology, Formal analysis, Data curation. **X.I.N. Li:** Resources, Methodology. **K.E.L.I.M.U. Abudureyimu:** Project administration, Methodology.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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List of abbreviations

LAGB Laparoscopic adjustable gastric banding
CT Computed Tomography

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