Case 15770

Eurorad

Slipped gastric banding: how to diagnose a characteristic complication

Published on 17.12.2018

DOI: 10.1594/EURORAD/CASE.15770
ISSN: 1563-4086
Section: Abdominal imaging
Area of Interest: Stomach (incl. Oesophagus)
Procedure: Surgery
Imaging Technique: CT
Special Focus: Obstruction / Occlusion Case Type:
Clinical Cases
Authors: Tonolini Massimo, MD (1); Di Pietro Salvatore, MD (1,2).
Patient: 25 years, female

Clinical History:

Young female with history of laparoscopic gastric banding positioning five years earlier, suffering from decreased food intake, vomiting and sudden weight loss since 3 weeks. Seen at emergency department, with laboratory evidence of dehydration and malnutrition, specifically hypokalemia (2.5 mmol/L), low total proteins and prealbumin (21 mg/dL).

Imaging Findings:

Nine months earlier, she had upper digestive endoscopy with unremarkable findings including normal gastric mucosa. Initial radiographs (Fig.1) showed gaseous overdistension of the proximal gastric pouch, and the band appeared in a near-horizontal position relative to longitudinal spine axis consistent with an abnormal (~90°) phi angle.
Further CT investigation (Fig.2), including contrast-enhanced acquisition following sipping of some water-soluble iodinated contrast by mouth, showed confirmed markedly distended stomach with abundant intraluminal fluid, with entire fundus and part of gastric body herniated above the distally slipped band, contracted stoma and some perigastric fluid.
Following removal of fluid (1 liter) by nasogastric intubation and partial detension of gastric band, repeated radiographs (Fig.3) showed persistent overdistension of upward herniated stomach with air-fluid level indicating impaired transit.
After total parenteral nutrition, the patient underwent repeated surgery with confirmation and removal of slipped gastric banding, and resection of herniated sac.

Discussion:

Bariatric surgery is a fast-growing specialty with favourable risk-benefit profile, which consistently achieves substantial weight loss and reduces metabolic disorders and cardiovascular risk in morbidly obese individuals [1, 2]. Albeit sleeve gastrectomy is increasingly used, laparoscopic adjustable gastric banding (LABG) remains the commonest and less invasive bariatric operation. The silicon band with inflatable inner cuff is positioned 2 cm distal to the gastro-oesophageal junction, thus creating a small (15-30 ml capacity) proximal “gastric pouch” and causing early satiety from delayed food bolus transit. The stomal caliber is adjusted by injecting or aspirating saline via the subcutaneous port secured on the rectus muscle sheath, connected to the band via kink-resistant tubing. Compared

to Roux-en-Y gastric bypass, LABG is reversible and has very few early complications, but achieves less and slower weight loss. Furthermore, concerns are increasing over its long-term efficacy and safety, with complications and need for reoperation within 10 years reported in 33-40% and 9-22% of patients, respectively [3-6].
Since bariatric patients often present to emergency departments with nonspecific complaints months or years after surgery, radiologists need familiarity with normal and complicated postoperative appearances. Following LABG, the commonest complication is band slippage (BS), which refers to cephalad herniation of the distal stomach through the band, secondary to inadequate fixation and increased pressure on the proximal pouch. Favoured by poor nutritional habits, BS occurs in 4.9-8.1% (up to 15-22% in some series) of patients. Manifestations include abdominal pain, food intolerance or dysphagia, nausea/vomiting, severe reflux symptoms. Untreated BS may result in chronic stomal stricture, or lead to further complications such as obstruction, volvulus, gastric ischemia and haemorrhage [3-8].
Radiographically, the proximal gastric pouch is eccentrically and often markedly dilated (> 4cm), and the radio-opaque gastric band projects left to the spine, roughly 5 cm below the diaphragm. Compared to normal inclination, malpositioned bands are rotated clockwise to a more horizontal position or oriented “en face”. As in this patient, use of water-soluble oral contrast may allow to assess patency of LABG, and CT may further elucidate postsurgical anatomy [9-12].
The commonest differential diagnosis of BS is acute (from band overtightening) or chronic (from excessive filling and adhesions) stomal stricture, with concentric pouch dilatation, nonobstructed stoma and normal band positioning, generally relieved by band loosening. Conversely, patients with SB are treated by urgent deflation, but ultimately require surgical band removal or conversion to another surgery in over half of cases [7, 8].

Written informed patient consent for publication has been obtained.
Differential Diagnosis List: Slipped gastric banding., Gastric obstruction from band overtightening, Chronic gastric pouch dilatation, Mechanical port/tubing system dysfunction, Band-related gastric erosion (rare, Gastric perforation (exceptional)

Final Diagnosis: Slipped gastric banding.

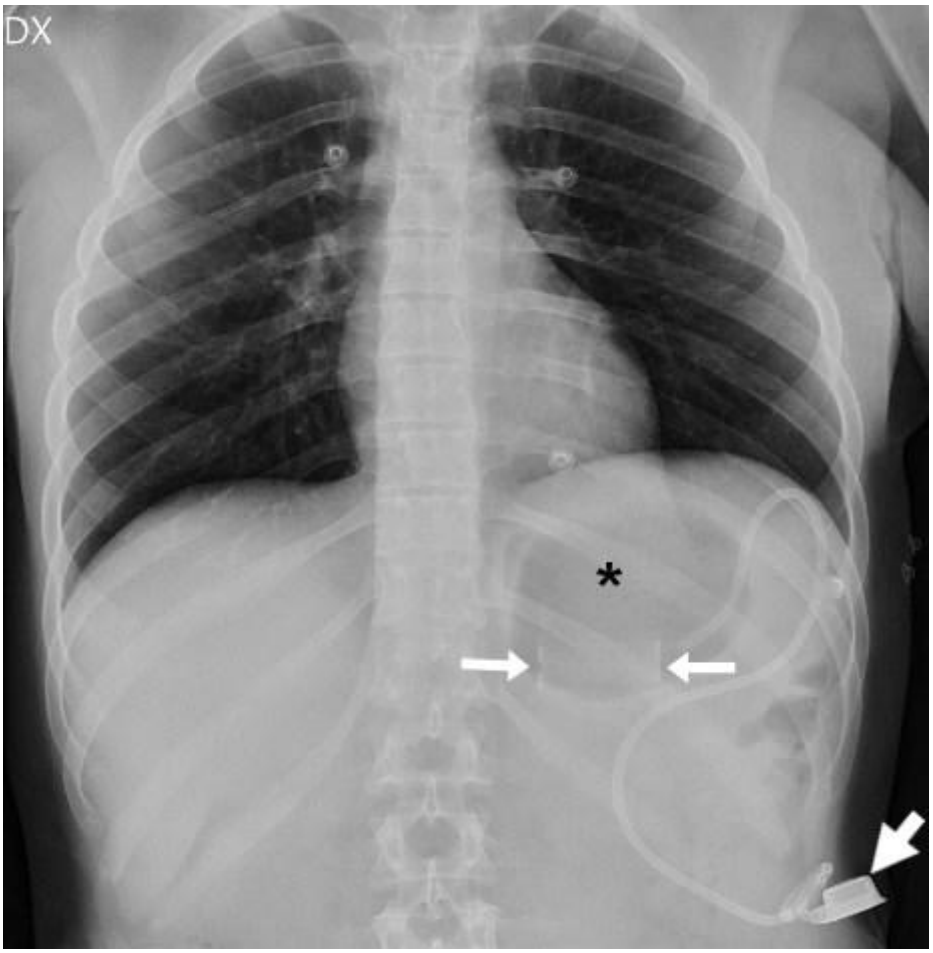
References:

Kodner C, Hartman DR (2014) Complications of adjustable gastric banding surgery for obesity. Am Fam Physician 89:813-818. (PMID: 24866217)
Hopkins JC, Blazeby JM, Rogers CA, et al (2016) The use of adjustable gastric bands for management of severe and complex obesity. Br Med Bull 118:64-72. (PMID: 27034443)
Boza C, Gamboa C, Perez G, et al (2011) Laparoscopic adjustable gastric banding (LAGB): surgical results and 5-year follow-up. Surg Endosc 25:292-297. (PMID: 20652325)
Angrisani L, Cutolo PP, Formisano G, et al (2013) Long-term outcomes of laparoscopic adjustable silicone gastric banding (LAGB) in moderately obese patients with and without co-morbidities. Obes Surg 23:897-902 (PMID: 23529850)
O'Brien PE, MacDonald L, Anderson M, et al (2013) Long-term outcomes after bariatric surgery: fifteen-year follow-up of adjustable gastric banding and a systematic review of the bariatric surgical literature. Ann Surg 257:87-94. (PMID: 23235396)
Shen X, Zhang X, Bi J, et al (2015) Long-term complications requiring reoperations after laparoscopic adjustable gastric banding: a systematic review. Surg Obes Relat Dis 11:956-964 (PMID: 25638595)
Singhal R, Bryant C, Kitchen M, et al (2010) Band slippage and erosion after laparoscopic gastric banding: a meta-analysis. Surg Endosc 24:2980-2986. (PMID: 20680349)
Szewczyk T, Janczak P, Jezierska N, et al (2017) Slippage-a Significant Problem Following Gastric Banding-a Single Centre Experience. Obes Surg 27:2637-2642. (PMID: 28439749)
Beitner M, Kurian MS (2012) Laparoscopic adjustable gastric banding. Abdom Imaging 37:687-689. (PMID: 22446895

)
Sonavane SK, Menias CO, Kantawala KP, et al (2012) Laparoscopic adjustable gastric banding: what radiologists need to know. Radiographics 32:1161-1178. (PMID: 22787000)
Flowers D, Pearce O, Somers S, et al (2013) Gastric bands: what the general radiologist should know. Clin Radiol 68:488-499 (PMID: 23031824)
Riaz RM, Myers DT, Williams TR (2016) Multidetector CT imaging of bariatric surgical complications: a pictorial review. Abdom Radiol (NY) 41:174-188. (PMID: 26830623)

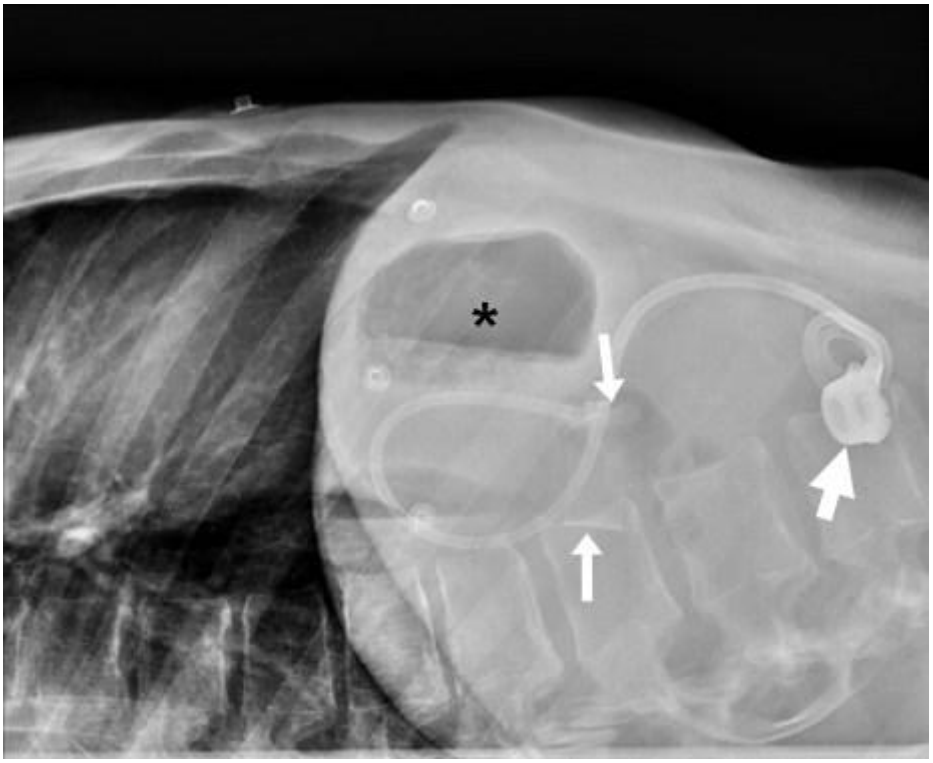
Figure 1

a



Description: The proximal gastric pouch (*) appeared overdistended with air, above the gastric band (arrows) connected via tube to the subcutaneous port (thick arrows). Note band in horizontal position relative to longitudinal spine axis (phi angle approximately 90°). **Origin:** Tonolini M, Radiology Department, “Luigi Sacco" University Hospital – Milan (Italy)

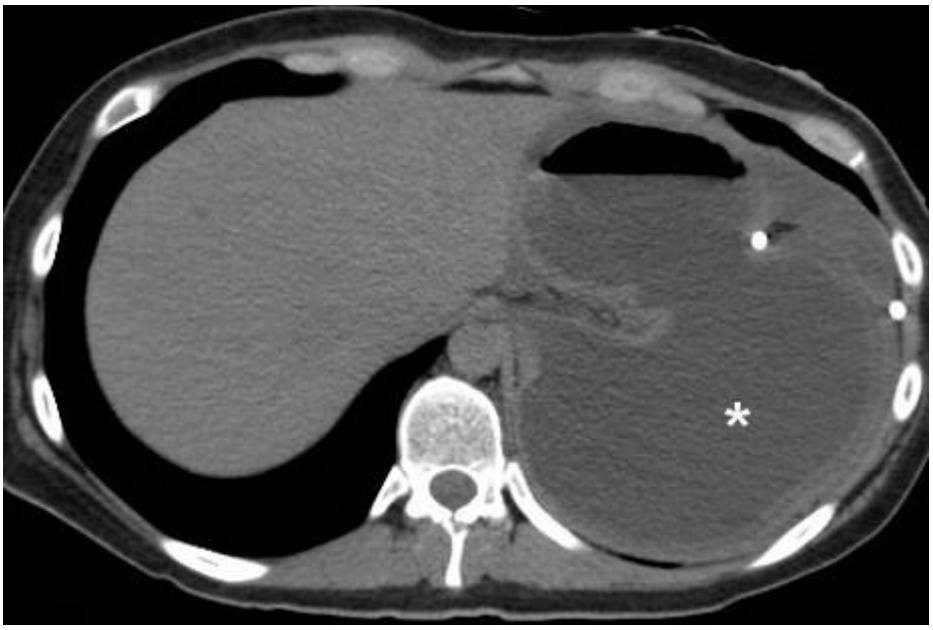
b



Description: The proximal gastric pouch (*) appeared overdistended with air, above the gastric band (arrows) connected via tube to the subcutaneous port (thick arrows). **Origin:** Tonolini M, Radiology Department, “Luigi Sacco" University Hospital – Milan (Italy)

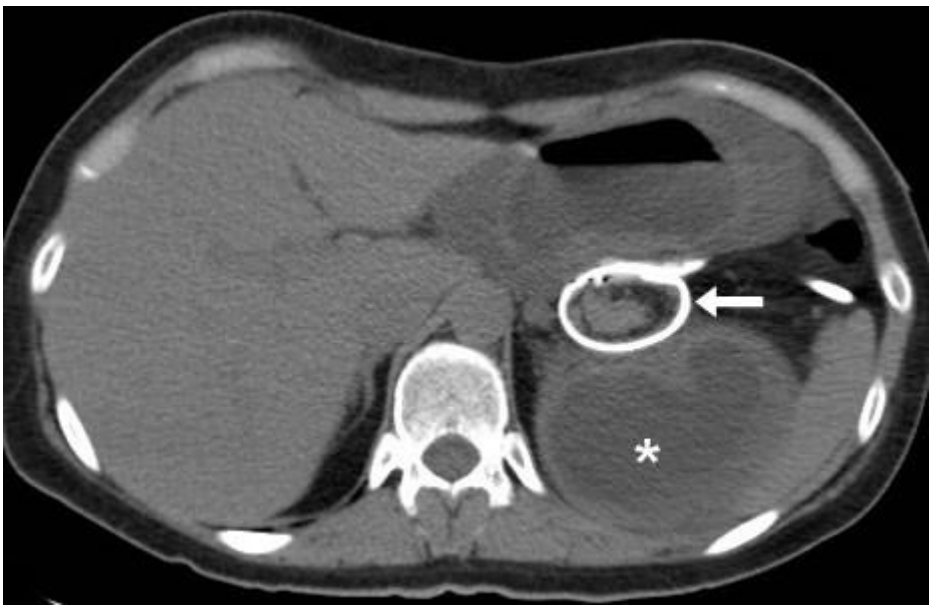
Figure 2

a



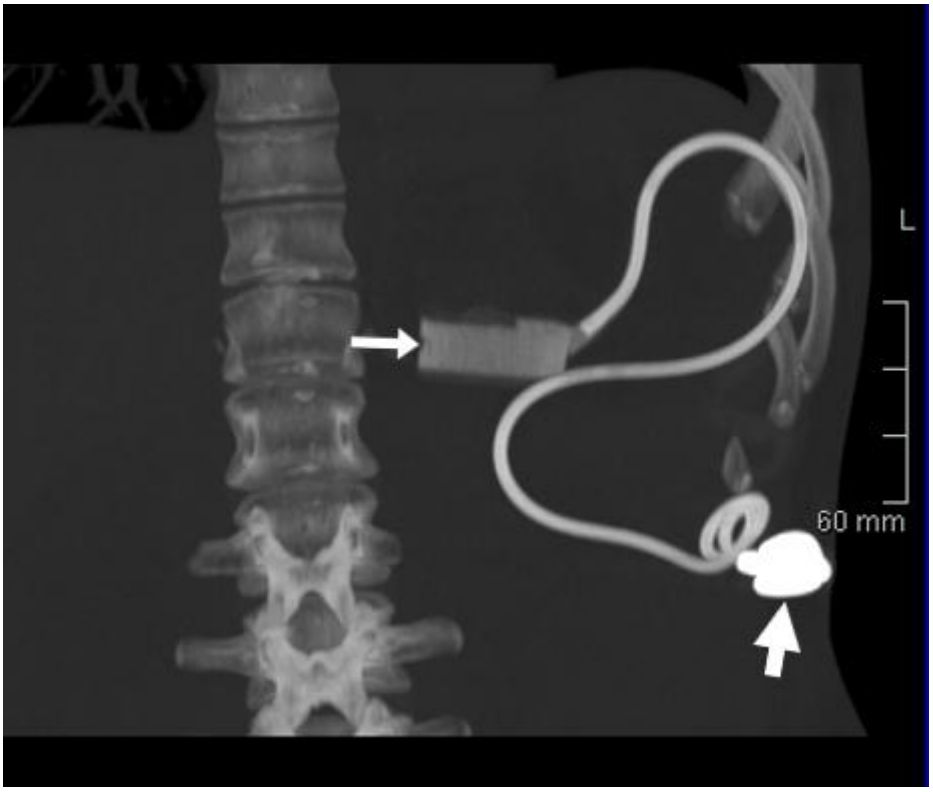
Description: Precontrast images (a...c) showed markedly distended stomach (*) with abundant intraluminal fluid, with entire fundus and part of body herniated above the gastric band (arrow in b).
Origin: Tonolini M, Radiology Department, “Luigi Sacco" University Hospital – Milan (Italy)

b



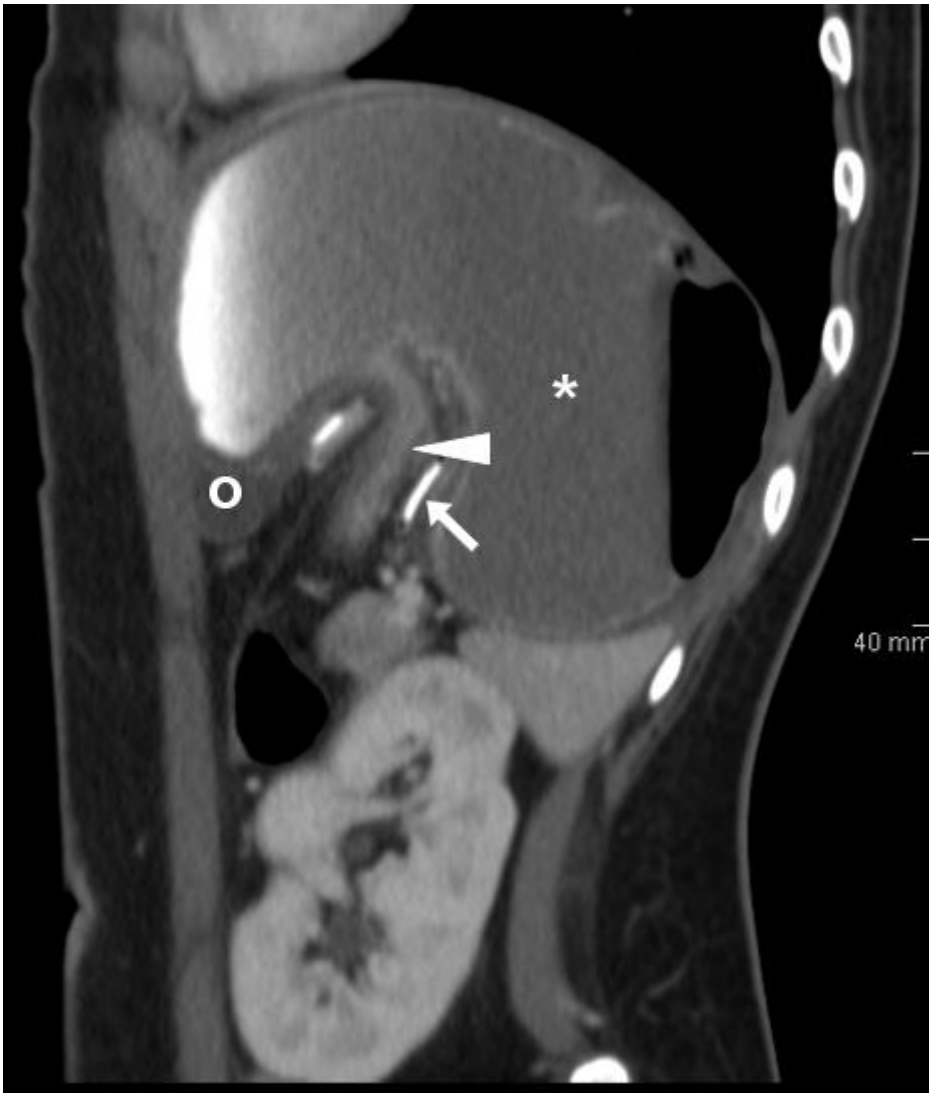
Description: Precontrast images (a...c) showed markedly distended stomach (*) with abundant intraluminal fluid, with entire fundus and part of body herniated above the gastric band (arrow in b).
Origin: Tonolini M, Radiology Department, “Luigi Sacco" University Hospital – Milan (Italy)

c



Description: Maximum intensity projection (MIP) reconstruction showed integrity of gastric band (arrow), tube and subcutaneous access port (thick arrow), without signs of mechanical problems. Note band in nearly horizontal position relative to longitudinal spine axis. **Origin:** Tonolini M, Radiology Department, “Luigi Sacco" University Hospital – Milan (Italy)

d



Description: Portal-venous phase enhanced images (in prone position) confirmed overdistended stomach (*) with fluid and some dependent water-soluble oral contrast, largely herniated above the band (arrows) with contracted stoma (arrowheads). Note some perigastric fluid (o). **Origin:** Tonolini M, Radiology Department, “Luigi Sacco" University Hospital – Milan (Italy)

e

Description: Portal-venous phase enhanced images (in prone position) confirmed overdistended stomach (*) with fluid and some dependent water-soluble oral contrast, largely herniated above the band (arrows) with contracted stoma (arrowheads). Note some perigastric fluid (o). **Origin:** Tonolini M, Radiology Department, “Luigi Sacco" University Hospital – Milan (Italy)

f

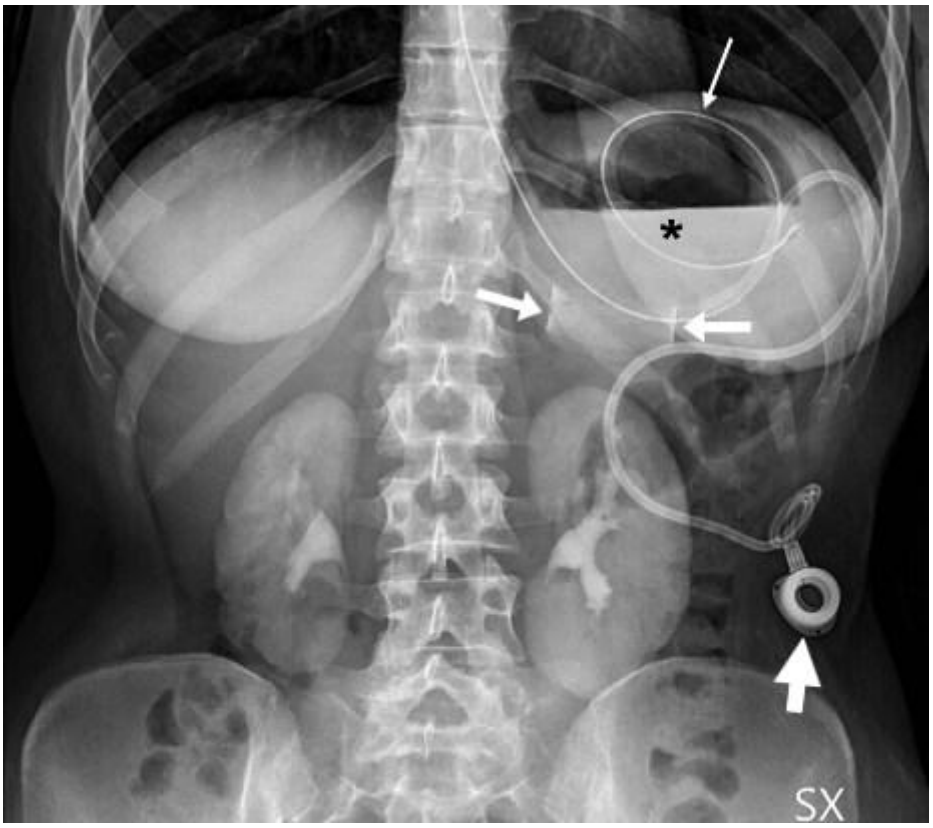
Description: Portal-venous phase enhanced images (in prone position) confirmed overdistended stomach (*) with fluid and some dependent water-soluble oral contrast, largely herniated above the band (arrows) with contracted stoma (arrowheads). Note some perigastric fluid (o). **Origin:** Tonolini M, Radiology Department, “Luigi Sacco" University Hospital – Milan (Italy)

g

Description: Portal-venous phase enhanced images (in prone position) confirmed overdistended stomach (*) with fluid and some dependent water-soluble oral contrast, largely herniated above the band (arrows) with contracted stoma (arrowheads). Note some perigastric fluid (o). **Origin:** Tonolini M, Radiology Department, “Luigi Sacco" University Hospital – Milan (Italy)

Figure 3

a



Description: Repeated radiographs showed persistent overdistension of proximal gastric pouch (*) with air-fluid level indicating impaired transit through band (arrows). **Origin:** Tonolini M, Radiology Department, “Luigi Sacco" University Hospital – Milan (Italy)