Stent-related complications after endoscopic treatment of postsurgical anastomotic leak after bariatric surgery

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Section: Abdominal imaging
Area of Interest: Gastrointestinal tract
Procedure: Stents
Technique: Fluoroscopy
Technique: CT
Special Focus: Prostheses Case Type: Clinical Cases
Authors: Tonolini Massimo, M.D.
Patient: 37 years, female

Clinical History:

Following recent bariatric surgery (gastric bypass) complicated by gastro-jejunal anastomotic fistulisation at another institution, an obese woman was transferred to our hospital to undergo endoscopic treatment with stent positioning. Three weeks later she suffered from biliary emesis and upper abdominal pain without peritonism. Laboratory revealed leukocytosis and increased C-Reactive protein.

Imaging Findings:

At admission, a covered self-expanding metal stent (SEMS) was positioned endoscopically through the gastric bypass under fluoroscopic guidance (Fig. 1) with verification of patency. Three weeks later, urgent CT including focused multiplanar and oblique reformations (Fig. 2) depicted SEMS integrity and positioning across the gastric bypass, minimal (<1 cm) distal migration, fluid filling of the stent lumen from stasis caused by distal impaction to the jejunal wall. A few days later, radiographic follow-up (Fig. 3a) showed significant (approx. 3 cm) distal migration compared to initial positioning of the SEMS, which was then repositioned endoscopically with success (Fig. 3b...f).

Despite achievement of slow clinical and nutritional improvement, after two more weeks repeated radiographs (not shown) and multidetector CT (Fig. 4) showed recurrent distal stent migration with intraluminal stasis of orally administered iodinated contrast medium and distal impaction. Repeated endoscopy under fluoroscopy confirmed further distal migration of the SEMS, which was finally removed.

Discussion:

Endoscopic positioning of self-expandable stents (SEMS) currently represents the gold standard palliative treatment of inoperable oesophageal and gastroduodenal tumours. Recently, fully covered SEMS are increasingly used to re-establish patency in benign (post-radiation, caustic or anastomotic) upper gastrointestinal (UGI) strictures not amenable or refractory to endoscopic dilatation, to seal spontaneous and iatrogenic perforations, and to divert flow in postoperative complications after foregut surgery, with 80-90% overall technical and clinical successful rates [1, 2]. Gastroesophageal leaks or fistulas from staple-line dehiscence and chronic anastomotic strictures represent not-uncommon (1-7% of patients) iatrogenic complications after bariatric surgery. These dreaded, challenging
occurrences have no standardized treatment and usually require long-term parenteral nutrition, sometimes surgical repair or diversion. Since avoiding repeated surgery is highly desirable, endoscopic treatment is increasingly employed as the primary minimally invasive management of postsurgical UGI injuries, to allow symptom improvement, early enteral nutrition, suppressing sepsis, and shortened healing time [2-9].

Unfortunately, SEMS are not designed for surgically altered anatomy, and endoscopic stenting has moderate efficacy (56-72%) as definitive treatment of iatrogenic complications. The high post-UGI stenting morbidity includes severe pain, gastroesophageal reflux, stent migration (SM), stent collapse, blockage or hyperplastic tissue obstruction, occasionally haemorrhage or perforation [1, 6-11].

By far the commonest complication (up to 36-47%), SM is more frequent with covered SEMS, stents placed at anastomotic strictures and across the gastroesophageal junction. Larger (diameter >25 mm) migrate less frequently, but have higher risk of UGI perforation, bleeding and fistulization. Occurring after a variable time interval following placement, SM is often asymptomatic and therefore overlooked. Alternatively, patients may complain of recurrent dysphagia and chest pain. Migrated stents may be eliminated with stools or treated conservatively when they remain in the stomach without clinical complications. Prompt SM diagnosis allows endoscopic removal, repositioning or fixation. Occasionally (up to 4.3% of patients) SM requires surgery because of further complications such as duodenal impaction, small bowel obstruction, haemorrhage or perforation [1-3, 10-12].

Serial plain radiographs may be useful for regular surveillance and assessment of SEMS position in the UGI. As this case exemplifies, multidetector CT including appropriate multiplanar reformations provides a comprehensive high-resolution display of the stent, allowing assessment of its integrity, patency and position, and of its anatomical relationships with the UGI wall and surrounding structures, and is therefore invaluable for detection of stent-related complications [11].

Differential Diagnosis List: Stent migration after endoscopic treatment of postsurgical anastomotic leak, Initial stent misplacement, Correctly positioned and patent stent, Iatrogenic visceral perforation, Iatrogenic haemorrhage, Persistent post-surgical leak, Abscess formation

Final Diagnosis: Stent migration after endoscopic treatment of postsurgical anastomotic leak

References:


Puig CA, Waked TM, Baron TH, Sr., et al. (2014) The role of endoscopic stents in the management of chronic anastomotic and staple line leaks and chronic strictures after bariatric surgery. Surg Obes Relat Dis10:613-617


**Description:** Fluoroscopic images document positioning of self-expanding metal stent through the gastric bypass, with its upper extremity projecting 5.5 cm above the diaphragmatic contour. **Origin:** Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
Description: Fluoroscopic images during administration of iodinated contrast through the endoscope confirmed patency of self-expanding metal stent placed through the gastric bypass. Origin: Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
Description: Scout-view (a), unenhanced (b,c) and post-contrast (d,e) CT images showed minimal (<1 cm) distal migration of the stent compared to initial positioning. Note surgical clips (thin arrows) and drainage (arrows). Origin: Tonolini Massimo, Department of Radiology, "Luigi Sacco" University Hospital – Milan (Italy)
Description: Unenhanced (b,c) and post-contrast (d,e) axial CT images showed stent lumen mostly filled with fluid (*) due to stasis, no appreciable perivisceral abnormalities. Note surgical clips (thin arrows) and drainage (arrows). Origin: Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
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Description: Sagittal (f), coronal (g) and oblique (h,i) reformatted images depicted stent integrity and positioning across the gastric bypass, with intraluminal fluid stasis (*) from distal impaction (arrowheads) to the jejunal wall. Origin: Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
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Figure 3

Description: Plain radiograph (a) showed significant (approx. 3 cm) distal stent migration compared to initial positioning. Origin: Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
Description: Under fluoroscopic guidance, the migrated gastroesophageal stent (b) was endoscopically repositioned more cranially (c). Origin: Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
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Description: Plain radiographs (d..e) at procedure termination confirmed successful repositioning of gastroesophageal stent. Note iodinated contrast medium in the colonic lumen. Origin: Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
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Description: Unenhanced (a) and post-contrast images (b...d) after administration of oral diluted contrast showed relapse of distal stent migration: note proximal end of the stent at the level of the hepatic vein confluence (b). **Origin:** Tonolini Massimo, Department of Radiology, "Luigi Sacco" University Hospital – Milan (Italy)
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Description: Contrast-enhanced images (b...d) after administration of oral diluted contrast showed relapse of distal stent migration: note stent filled by ingested iodinated contrast due to stasis. Origin: Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
Description: Contrast-enhanced images (b...d) after administration of oral diluted contrast showed relapse of distal stent migration: note stent filled by ingested iodinated contrast due to stasis. 

Origin: Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
Description: Sagittal (e) and oblique (f) reformatted images depicted stent integrity and positioning across the gastric bypass, with intraluminal stasis of ingested iodinated contrast, again with distal impaction (arrowheads) to the jejunal wall. Origin: Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
Description: Sagittal (e) and oblique (f) reformatted images depicted stent integrity and positioning across the gastric bypass, with intraluminal stasis of ingested iodinated contrast, again with distal impaction (arrowheads) to the jejunal wall. **Origin:** Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
Description: Fluoroscopic images confirmed further distal migration of the gastric bypass stent (a), which was finally removed (b). Origin: Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
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