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CASE REPORT

Stent-induced compression necrosis for the endoscopic removal of a partially eroded Lap-Band

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SUMMARY

Endoscopic removal of eroded Lap-Bands is a minimally invasive alternative to surgical removal that prerequisites sufficient erosion through the gastric wall, that is, $\geq 180^\circ$ of the gastro-oesophageal wall circumference. A 69-year-old woman presented with dysphagia due to a long-standing Lap-Band erosion, currently of a 60° circumference. Adhesions due to her extensive surgical history rendered surgical treatment undesirable, so a self-expanding stent was placed endoscopically to induce sufficient erosion for subsequent endoscopic removal. During therapy, the patient complained of ructus and dysphagia, probably related to an overly proximally (oesophageal) positioned stent. After a total of 12 weeks, far longer than the described stenting duration in the literature, the Lap-Band was found free in the gastric lumen and was successfully removed using an endoscopic loop. Stent-induced compression necrosis should be considered as a minimally invasive treatment option for Lap-Bands eroded for $< 180^\circ$, with caution in the context of extensive fibrosis.

BACKGROUND

Lap-Band erosion is an uncommon and late complication of laparoscopic gastric banding with troublesome consequences, such as abdominal pain, nausea, vomiting and dysphagia.¹ This complication is, by convention, treated surgically, although this is often challenging due to excessive proximal perigastric inflammation and weakness of the stomach wall, where a gastrotomy and subsequent closure has to be performed. Therefore, pure endoscopic approaches may be preferred, which prerequisite sufficient Lap-Band erosion, that is, $\geq 180^\circ$.² The endoscopic treatment of this complication has been described in several case series with acceptable results.^{2–12} Lamentably, the available literature exclusively concerns patients for whom surgery is a viable alternative treatment and in whom the Lap-Band has eroded sufficiently ($\geq 180^\circ$) to allow for endoscopic extraction. To our knowledge, there are two case series on the use of self-expanding stents to induce erosion to a point that allows for endoscopic retrieval of an eroded gastric band.^{13 14} This literature exclusively concerns patients with non-adjustable gastric bands in whom surgical intervention was not contraindicated and resulted in an average stenting time of approximately 2 weeks.

We describe the complicated, prolonged (12 weeks stenting time), yet fruitful clinical course of this stent-based approach in a patient with a

Lap-Band erosion of only 60° and with an extensive abdominal surgical history that rendered surgical removal undesirable. This case is unique in its complexity and serves as a reminder of key points on the endoscopic approach to Lap-Band erosions, such as its prerequisites, procedural considerations, as well as the patient's perspective. Moreover, this approach may be of use in other clinical scenarios, such as erosion of antireflux sphincter augmentation devices.

CASE PRESENTATION

A 69-year-old, healthy-appearing woman presented to the surgery department with dysphagia to solid foods, nausea, and non-biliary, non-bloody vomiting after warm meals. These complaints commenced after a surgical procedure 6 weeks earlier, in which two enterocutaneous fistula complexes, related to mesh infection, were removed. She has an extensive surgical history, including open placement of a Lap-Band 9 years earlier and numerous subsequent cicatricial hernia corrections. Approximately 1 year ago, the port of her Lap-Band was removed. Her Lap-Band was currently empty and in situ.

INVESTIGATIONS

Her abdomen was soft and non-tender to palpation. Her lab results showed no abnormalities besides slightly elevated C reactive protein (13 mg/L). Endoscopy revealed/showed a 60° Lap-Band erosion towards the gastric lumen, with the Lap-Band tubing partially connected to the Lap-Band (see figure 1). Considering the absence of abdominal pain or signs of perforation, this was suspected to be a long-standing issue.

TREATMENT

A hybrid procedure for Lap-Band removal was undesirable due to the presence of multiple extensive abdominal adhesions relating to a previous surgery. Considering her dysphagia complaints, the most appropriate treatment option seemed stent placement to accelerate Lap-Band erosion via compression necrosis. A 23×105 mm fully covered WallFlex stent was placed in the cardia, through the Lap-Band, under fluoroscopic visualisation. One week postendoscopy, she reported that eating solid foods was going reasonably well.

Four weeks after stent placement, a follow-up endoscopy revealed a correctly positioned stent in the distal oesophagus, with the top at 35 cm from the incisors (see figure 2). The stent was removed



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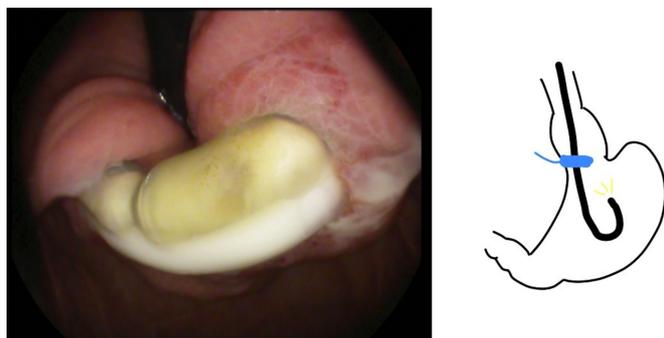


Figure 1 Left: Endoscopic view of the Lap-Band that has eroded through 60° of the circumference of the cardia. Right: Schematic illustrating the viewing angle of the endoscope, with the gastric band illustrated in blue and the endoscope in black.

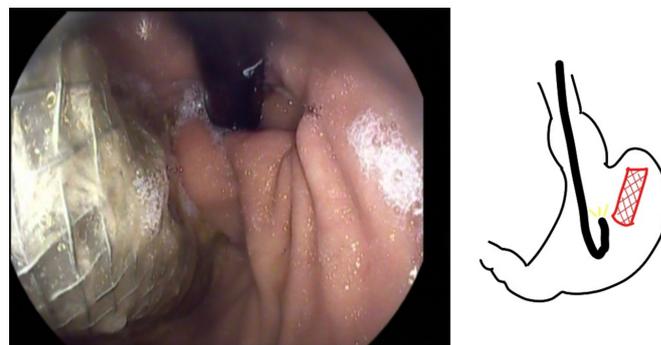


Figure 3 Left: Endoscopic view of the stent floating freely in the stomach lumen, with the tip in the fundus. Right: Schematic illustrating the viewing angle of the endoscope, stent in red.

with a gripping forceps. In the stomach, a 160° eroded Lap-Band was found. Still, removal of the Lap-Band with a grasping forceps was impossible. Therefore, a new 23×105 mm fully covered WallFlex stent was ordered for placement the following/next week.

In the subsequent week, the patient reported that her dysphagia had reduced greatly since the removal of the stent. Therefore, direct endoscopic removal of the Lap-Band without the use of a stent was preferred. In the cardia, a 160° eroded Lap-Band was seen. Thus, a new 23×105 mm fully covered WallFlex stent was placed.

Three weeks after the procedure, the patient expressed a desire for early stent removal due to complaints of ructus and dysphagia. She was advised to tolerate these complaints for the upcoming 5 weeks, since the stent had previously remained in situ for 4 weeks with insufficient result.

Two months after the placement of the second stent, endoscopy revealed a fully eroded Lap-Band free in the antrum (see figure 3). Inspection in retroversion showed obvious fistula openings, but sight was limited due to food retention. Some mucosal damage and bleeding were seen in the distal oesophagus, but check-up after removal showed no more lacerations. The Lap-Band and the stent were removed using a loop (see figure 4). The patient was then prescribed Augmentin 625 mg thrice daily for 5 days for the fistula and pantoprazole 40 mg twice daily for 14 days. Subsequently, an expectative policy was executed.

OUTCOME AND FOLLOW-UP

Directly after the transoral removal of the Lap-Band, the patient reported a tender throat and difficulty swallowing liquids and solids, which both resolved after 1 day. Six months after the final endoscopic intervention, she reports complete relief of the

symptoms of dysphagia for which she was admitted earlier. Her weight has stabilised at a healthy 70 kg.

DISCUSSION

By general consensus, pure endoscopic removal of a Lap-Band is applied when a band is eroded through the full gastric wall thickness for $\geq 180^\circ$ or $\geq 50\%$.⁴ Erosions $< 180^\circ$ are currently managed with an expectative policy that requires time-intensive, costly and tedious regular endoscopic evaluations, as well as delay in symptom relief.

The use of stents to accelerate erosion of gastric bands to $\geq 180^\circ$ was studied in a retrospective case series in 2013 of 15 patients with non-adjustable gastric bands, with success and complication rates of 87% and 33%, respectively.¹³ Complications included substernal chest pain and migration, which both prompted premature stent removal, as well as nausea and/or vomiting. Interestingly, nausea and vomiting occurred only in patients in whom the stents overlapped the oesophagus. Therefore, the gastroenterologists started placing the stent more distally, which improved the tolerability. This information is in line with our practice, where the patient complained of the stent which was partially located in the distal oesophagus.

There is no preset duration for which stent-induced compression necrosis should be applied. In the aforementioned case series, the stent was present for an average of 16 days (range: 3–28 days) prior to Lap-Band removal.¹³ A comparable stenting duration was seen in another case series on stent placement for silastic ring erosion after a Roux-en-Y gastric bypass.¹⁴ This is significantly shorter than the time our patient required stenting (12 weeks). This may be explained by the fact that there was no pre-existent erosion in the case series, while our patient probably had long-standing pre-existent erosion. This pre-existent erosion may be associated with the formation of a strong fibrous

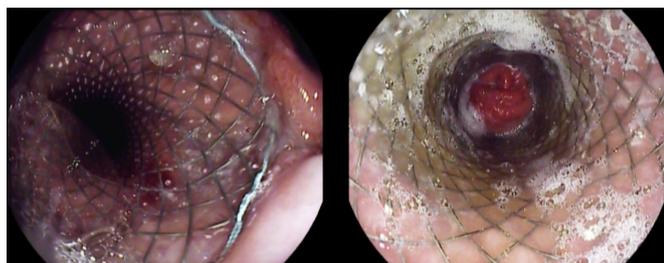


Figure 2 Left: Superior view of stent in the oesophagus. Right: Inferior view of the stent in the oesophagus–cardia junction.



Figure 4 Left: Lap-Band directly after endoscopic removal. Right: Cleaned Lap-Band and the stent placed within the band.

Patient's perspective

The patient's perspective below was written by the first author in conjunction with the patient.

"I have an extensive surgical history, with bowel operations, fistulas, stoma's and fortifying meshes. When I spoke to my surgeon about this eroded Lap-Band, I suggested that they should build in a zipper in by abdomen, for purposes of convenience. However, my surgeon was adamant about avoiding surgery and suggested endoscopic removal by a gastroenterologist. The gastroenterologist who I was referred to actually drew the entire procedure out for me, which created more understanding and therefore a sense of trust. However, I am still in awe of how the entire Lap-Band and stent were removed from my mouth.

With regard to the treatment itself, I would recommend it to other patients for whom surgical removal is a poor option. The first stent did not really bother me, but the second stent gave me a tender feeling in my chest and I could really feel it lying in my esophagus. After removal of the Lap-Band, I had a tender throat for a day, after which I was able to normally eat for a few weeks. Then, however, it started feeling as though there was still a Lap-Band in my stomach and it became more difficult to eat solid foods, such as meat. Perhaps my anatomy has changed due to the procedure. This does not bother me, however, as I am currently at my maximum weight of 70 kg and easier swallowing would also mean easier weight gain. If I had to choose between my stomach now and my stomach before I had a Lap-Band, when I weighed 98 kg, I would chose for the stomach I have now.

On an unrelated note, I want to thank my husband for all the care that he has provided for me in the context of my surgical history. One of the nurses in the Maastricht University Medical Centre taught him how to bandage fistulas and now he does this better than any of the nurses that have come to my house in a rush to do it, as he takes the time. I think there is a lot to gain (and to save) in health care by investing in teaching the people surrounding patients how to take care of their loved ones".

Learning points

- ▶ Self-expanding stents can be used to accelerate Lap-Band erosion to a point sufficient for endoscopic removal, that is, $\geq 180^\circ$ of the gastro-oesophageal wall circumference.
- ▶ Contact between the stent and the oesophagus should be minimised to prevent iatrogenic dysphagia.
- ▶ The required duration of stenting may vary significantly between patients and may be determined by the amount of fibrous tissue surrounding the Lap-Band on presentation.

migration-retarding capsule surrounding the Lap-Band, especially considering the extensive abdominal fibrous inflammation due to her surgical history.

We described the complicated and prolonged clinical course of a stent-based, purely endoscopic approach for the accelerated erosion and subsequent removal of a Lap-Band in a patient for whom surgery was a highly unwanted treatment option. Randomised clinical trials are warranted, comparing the outcomes of waiting versus stenting before removal of an insufficiently eroded Lap-Band, in order to evaluate the safety, efficacy and cost-effectiveness of this technique.

Contributors AT wrote this article. The gastroenterologists who performed the endoscopic extraction were RdR and JWS. The primary caregiver of the patient was NDB.

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