



## Case report

# Symptomatic gastric diverticulum after gastric imbrication with conversion to sleeve gastrectomy

Amit Surve, M.D., Hinali Zaveri, M.D., Daniel Cottam, M.D.\*

*Bariatric Medicine Institute, Salt Lake City, Utah*

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Laparoscopic gastric imbrication (LGI) helps to promote weight loss by reducing the size of the stomach by plicating the greater curve of the stomach. However, if the stomach is not adequately plicated at the fundus, gastric diverticula occur. In this case the gastric diverticulum became symptomatic (chronic nausea) and necessitated conversion to a laparoscopic sleeve gastrectomy, which resulted in a resolution of the patient's symptoms.

## Case presentation

The patient, a middle-aged woman, presented to our clinic 5 years after an LGI with chronic nausea, vomiting, and left upper quadrant abdominal pain and a body mass index of 37 kg/m<sup>2</sup>. The pain had caused multiple emergency room visits without finding the cause of the left upper quadrant pain and chronic nausea. A follow-up diagnostic esophagogastroduodenoscopy revealed a large diverticulum in the fundus of the stomach with a 3-cm neck.

This patient was then electively admitted to convert to the LGI to a laparoscopic sleeve gastrectomy along with resection of diverticulum. She was discharged on the postoperative day 3 without any complaints of nausea or vomiting.

## Management

Four trocars were placed into the abdomen under direct vision. The scar tissue along the greater curve of the

stomach was taken down freeing up the entire greater curvature. We found diverticulum 1 cm from the angle of His.

At this point a gastroscope was introduced, which has 2 roles. This first was for use as a bougie. The second was to make sure our staple line was inside of the imbrication line because we did not take down the imbrication before do the resection. We began our staple line 5 cm proximal to pylorus and medial to the plicated stomach. The staple line was continued up to the angle of His, resecting the entire diverticulum. Before each staple firing we checked to make sure that the staple line was not dividing multiple layers of stomach and had excluded the imbrication.

## Discussion

Most diverticula in normal stomachs are asymptomatic and can be seen as fundic dilation in all bariatric surgical procedures. There are 2 types of gastric diverticula, congenital (true) and acquired (false) diverticula, with congenital types being more common [1]. True diverticula involve all layers of the gastric wall. In general, stomach diverticulum symptoms depend on the size of the diverticular neck, most commonly cause upper abdominal pain, nausea, and emesis, and are described in 18%–30% of cases [2–5]. Most authors recommend esophagogastroduodenoscopy to confirm or rule out gastric diverticulum because this modality easily confirms the location and size of the gastric diverticulum and provides the opportunity to biopsy any concurrent pathologic conditions [6].

The treatment of a diverticulum depends on its presentation. Asymptomatic diverticula can be left alone, and

\*Correspondence: Daniel Cottam, M.D., Bariatric Medicine Institute, 1046 East 100 South, Salt Lake City, UT 84102.

E-mail: [drdanielcottam@yahoo.com](mailto:drdanielcottam@yahoo.com)

symptomatic diverticula can be treated with antacid or surgery. Surgical resection is recommended when the diverticulum is large, symptomatic, or complicated by bleeding, perforation, or malignancy [7]. In 1998, Fine described the first laparoscopic resection of gastric diverticulum [8]. Since then, several cases of using laparoscopic method have been reported, and this approach is now considered well tolerated and feasible [9–12]. Simple resection of a diverticulum with laparoscopic cutting stapler has also been reported to be successful [13]. In some cases, a surgical approach can be challenging because the diverticulum is either collapsed or hidden in the splenic bed. Sometimes the wrong part of the stomach has been resected [2], and therefore combining the surgical procedure with intraoperative endoscopy is found to be more feasible, allowing one to stretch the diverticular sac to find an elusive diverticula [8,14–15].

However, in this case the diverticulum was causing pain, and the patient had regained much of the weight she had lost when she first had the gastric imbrication. We felt a sleeve would help her weight loss and resolve the symptoms from her diverticulum.

## Conclusion

Gastric sleeve resection can be successfully performed after gastric imbrication without taking down the prior gastric plications.

## Disclosures

*The authors have no commercial associations that might be a conflict of interest in relation to this article.*

## Appendix

### Supplementary data

Supplementary data cited in this article is available online at <http://dx.doi.org/10.1016/j.soard.2015.09.012>.

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