

# A rare long-term complication in a patient with gastric bypass: remnant gastric perforation

Oğuzhan Fatih Ay<sup>✉</sup>, Umut Eren Erdoğan<sup>✉</sup>, Hakan Tezer<sup>✉</sup>, Süleyman Şen<sup>✉</sup>

Department of General Surgery, Bursa Yüksek İhtisas Training and Research Hospital, Bursa, Turkey

## ABSTRACT

Roux-en-Y gastric bypass (RYGB), one of the most frequently performed operations within the scope of bariatric surgery, creates a remnant stomach containing the fundus, corpus and antrum where gastric acid and pepsinogen are synthesized in significant amounts. Although rare complications such as bleeding, perforation and ischemia occur regarding the remnant stomach. A 47-year-old male patient who was operated on for open RYGB 10 years ago was admitted to the emergency department with complaints of abdominal pain and deterioration in his general condition. The patient who had widespread tenderness in the abdomen was unstable on physical examination. It was observed that the remnant stomach was perforated 2.2 cm from the anterior surface of the corpus at emergency laparotomy after defining the upper gastrointestinal anatomy with the aid of peroperative endoscopy. The patient whose remnant stomach was resected was discharged uneventfully on the 5th postoperative day. The approach to remnant gastric perforations due to benign causes is the same as for gastric perforations. Laparotomy is indicated in unstable patients.

**Keywords:** Gastric bypass, perforation, complication, remnant stomach

**R**oux-en-Y gastric bypass (RYGB), one of the most frequently performed operations within the scope of bariatric surgery, creates a remnant stomach containing the fundus, corpus and antrum where gastric acid and pepsinogen are synthesized in significant amounts. Although rare, complications such as bleeding, perforation and ischemia occur regarding the remnant stomach [1]. In a study, it was stated that the incidence of non-functioning remnant gastric perforation was 0.25% [2].

Although the underlying mechanisms are not clearly revealed, *H. pylori*, NSAID use, smoking and alcohol are considered risk factors in remnant gastric perforations [3]. Diagnosis of remnant gastric perforations is difficult because there are no specific phys-

ical examination and radiological findings [1]. The surgical treatment of remnant gastric perforations varies in the literature. There are cases with primary closure, omentopexy or resection [1, 2].

In this article, we evaluated the management of remnant gastric perforation in a patient who underwent open gastric bypass surgery 10 years ago.

## CASE PRESENTATION

A 45-year-old male patient with no history of smoking or NSAID use, diagnosed with iron deficiency anemia, underwent open RYGB surgery 10 years ago, and was negative for *H.pylori* in his gastroscopy performed in

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**Address for correspondence:** Oğuzhan Fatih Ay, MD., Bursa Yüksek İhtisas Training and Research Hospital, Department of General Surgery, Mimarşinan mah., Emniyet Cad., 16310 Yıldırım, Bursa, Turkey. E-mail: droguzhanf.ay@gmail.com, GSM: +90 224 295 50 00

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2017, applied to the emergency department with abdominal pain and general condition disorder for about two days. The patient had a history of intermittent abdominal pain for about three years before applying to the emergency department.

On physical examination, arterial tension was 100/70 mmHg, pulse: 110 beat/min, body mass index (BMI): 29 kg/m<sup>2</sup>. The patient was tachypneic and agitated. There was widespread tenderness and distension on abdominal examination. Bowel sounds were decreased.

It was seen that white blood cells: 12000 [ 4-10, 103], hemoglobin: 9.4 [12-16] gr/dL, middle corpuscular column: 64 fL [80-120], C- reactive protein: 9 (0-3) mg/L in his laboratory tests. Millimetric air densities and free fluid were observed in the remnant stomach region on CT. (Fig. 1).



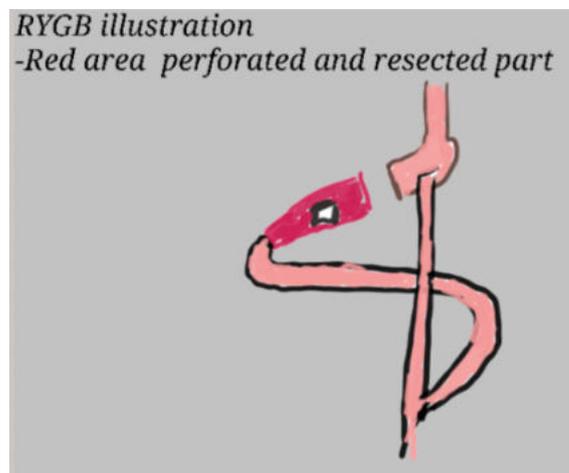
**Fig. 1.** CT image in emergency room application perigastric minimal air densities.

Emergency laparotomy was decided based on the patient's septic clinic and findings. After the anatomy was defined with the help of gastroscopy in the operation, and it was observed that the blood supply of the remnant stomach was impaired and there was a 2.2 cm perforation in the corpus region (Figs. 2 and 3).

The remnant stomach was resected divided from duodenum with stapler because of considering that primary repair would not be appropriate due to intra-abdominal contamination. Oral intake was started on the second postoperative day, and the patient was discharged on the 5<sup>th</sup> postoperative day uneventfully. No



**Fig. 2.** Image after resection perforated 2.2 cm area on the anterior surface of the corpus.



**Fig. 3.** IOperation illustration.

malignancy was detected in the pathological examination.

**DISCUSSION**

Although the underlying mechanisms are not clearly revealed *H. pylori*, NSAID use, smoking and alcohol are considered risk factors in remnant gastric perforations. In a study comparing the presence of *H. pylori* in the remnant and functional stomach; it was reported

that all cases with *H. pylori* positive in the remnant stomach were also positive in the functional stomach. Recent studies on remnant mucosal histology have reported that chronic gastritis, pangastritis, atrophy, and intestinal metaplasia are seen [3]. Biopsy taken from the functional stomach part of the patient in 2017 and pathological examination was negative for *H. pylori* and pathological examination revealed inflammatory granulation tissue.

In a study, it was stated that the incidence of non-functioning remnant gastric perforation was 0.25% [2]. Iranmanesh *et al.* [1] state that acute remnant gastric perforations occur approximately two years after RYGB [1]. Remnant gastric perforation developed in our patient approximately one year after the RYGB operation.

Diagnosis of acute remnant gastric complications is difficult because there are no specific clinical and radiological findings [1]. Since the remnant stomach does not contain air, air densities may not be seen in the tomography of remnant gastric perforations [4].

Primary repair and omentopexy is the first recommended treatment in the surgical treatment of remnant gastric perforation since the remnant stomach is a low-pressure region. However, remnant gastrectomy can be performed in cases of bleeding, necrosis, gastrogastric fistula. Some authors even recommend remnant gastrectomy in the presence of unexplained abdominal pain in RYGB operated patients after certain diagnoses such as cholelithiasis and internal herniation have been excluded [1]. In addition, performing total gastrectomy instead of partial in perforated remnant stomachs provides definitive treatment as it will prevent peptic ulcer disease that may develop due to the residual antral mucosa [2]. In our case, remnant gastrectomy was performed because signs of necrosis were observed during the operation. However, the patient also had a history of intermittent abdominal pain for about three years.

Delayed gastric necrosis and perforation cases have poor outcomes and the mortality rate is 50-80% [4]. Since RYGB is the most frequently performed operation for bariatric surgeons worldwide, general surgeons should be alert to complications [5]. Surgeons managing bariatric surgery patients should have remnant gastric pathologies in their differential diagnosis [1].

## CONCLUSION

RYGB is one of the most common operations performed by bariatric surgeons. General surgeons should be alert for possible complications associated with these procedures. The approach to remnant gastric perforations due to benign causes is the same as for gastric perforations.

### Authors' Contribution

Study Conception: OFA, UEE, HT, SŞ; Study Design: OFA, UEE, HT, SŞ; Supervision: OFA, UEE, HT, SŞ; Funding: OFA, UEE, HT, SŞ; Materials: OFA, UEE, HT, SŞ; Data Collection and/or Processing: OFA, UEE, HT, SŞ; Statistical Analysis and/or Data Interpretation: OFA, UEE, HT, SŞ; Literature Review: OFA, UEE, HT, SŞ; Manuscript Preparation: OFA, UEE, HT, SŞ and Critical Review: OFA, UEE, HT, SŞ.

### Informed consent

Written informed consent was obtained from the patient for publication of this case and any accompanying images.

### Conflict of interest

The authors disclosed no conflict of interest during the preparation or publication of this manuscript.

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