ACG CASE REPORTS JOURNAL

CASE REPORT | STOMACH

Bleeding Mass in Remnant Stomach, Unveiling Lynch Syndrome 18 Years After Bariatric Roux-En-Y Gastric Bypass Surgery

Adam Qazi, MD[1], Karan Mathur, MD[2], Ryan D. Rosen, DO[3], Alyssa Stroud, MD[3], John Webber, MD[3], and Milton Mutchnick, MD, FACG[2]

[1]*Department of Internal Medicine, Wayne State University School of Medicine, Detroit, MI*
[2]*Division of Gastroenterology & Hepatology, Wayne State University School of Medicine, Detroit, MI*
[3]*Department of General & Minimally Invasive Surgery, Wayne State University School of Medicine, Detroit, MI*

ABSTRACT

There is sparse literature on the development of malignancy in remnant gastric stomach after bariatric Roux-en-Y gastric bypass surgery. We report a case of overt upper gastrointestinal bleeding from malignant adenocarcinoma in the remnant stomach presenting several years after bariatric Roux-En-Y gastric bypass surgery. The mass in the remnant stomach was surgically resected, and the patient was subsequently diagnosed with Lynch syndrome on genetic analysis.

KEYWORDS: gastrointestinal bleeding; Remnant stomach; Roux-En-Y gastric bypass; Lynch syndrome

INTRODUCTION

Roux-En-Y gastric bypass (RYGB) surgery is one of the commonly used bariatric procedures for weight loss in the United States.[1] Some of the long-term complications involving the unresected gastric remnant post RYGB include development of gastroduodenal perforation, bleeding, gastrogastric fistulas, and malignancy on rare occasions.[2] Gastric cancer is noted to be one of the common extracolonic malignancies associated with hereditary Lynch syndrome.[3] In this report, we present a case of bleeding adenocarcinoma involving gastric remnant unmasking diagnosis of Lynch syndrome on genetic analysis several years after RYGB surgery.

CASE REPORT

A 57-year-old woman with medical history of atrial fibrillation, gastrointestinal (GI) bleeding, cerebrovascular accident, hypertension, and hypothyroidism presented with 1-day history of melena. Associated symptoms included presyncope and generalized fatigue. There were no complaints of hematemesis, coffee-ground emesis, or hematochezia. Significant surgical history included bariatric RYGB 18 years ago and WATCHMAN device placement 1 week before presentation. Family history was significant for colorectal cancer in mother (diagnosed before the age of 60), prostate cancer in father, breast cancer in maternal aunt, and stomach cancer in uncle (diagnosed at 23 years). The patient had similar episodes of GI bleeding in the past with most recent episode 3 months before the current one. Workup at the time included upper GI endoscopy, which revealed a post-surgical RYGB anatomy, and colonoscopy, which showed a suboptimal bowel preparation but not active bleeding, large polyps, or masses. She also underwent capsule endoscopy, which showed scattered arteriovenous malformations in the distal terminal ileum. She was previously on rivaroxaban, which was stopped after the last event of GI bleeding. The patient was started on dual-antiplatelet therapy with aspirin and clopidogrel after the WATCHMAN device placement.

In the emergency department, the patient had further episodes of melena, followed by a syncopal episode. Blood pressure decreased from 120s/80s to 80s/60s mm Hg; heart rate remained in the 90s (beats per minute). On physical examination, there was mild epigastric tenderness without guarding or rigidity and melenic stool was noted in rectal vault on digital rectal examination. There was

ACG Case Rep J 2024;11:e01323. doi:10.14309/crj.0000000000001323. Published online: April 5, 2024

Correspondence: Karan Mathur, MD (fv1761@wayne.edu).

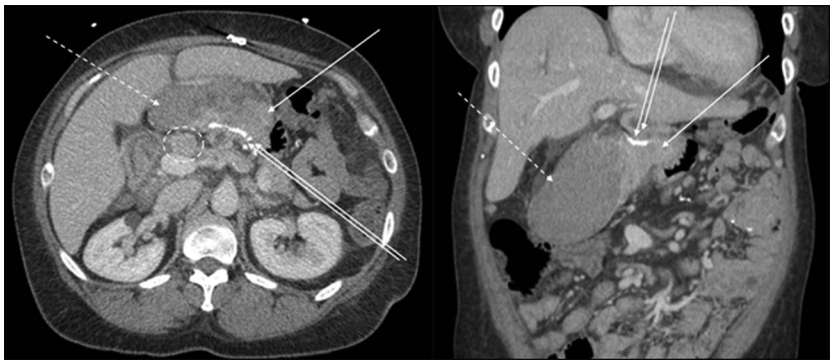

Figure 1. Preoperative computed tomography demonstrating a 5.8 × 5.6 × 5.3 cm necrotic mass (single arrow) within the remnant stomach, adjacent to the staple line from the previous Roux-en-Y gastric bypass (double arrow), a large hematoma distending the gastric body and pylorus (dashed arrow), and an enlarged porta hepatis lymph node (dashed circle).

a significant drop in hemoglobin from 10.3 to 6.3 (baseline 12–13) gm/dL within 3 hours of presentation. Other significant laboratory investigations included an elevated blood urea nitrogen-to-creatinine ratio of 31. White blood cell count, platelet count, coagulation profile, and renal and hepatic function were within normal limits. The patient was initiated on a massive transfusion protocol for ongoing hemodynamically unstable GI bleeding and was admitted to the medical intensive care unit for further management. Computed tomography angiography revealed postsurgical RYGB anatomy along with a large hematoma in the remnant stomach, serpiginous arterial hyperenhancing lesions in the remnant gastric body along the greater curvature, a necrotizing hyperenhancing mass measuring 5.8 × 5.6 × 5.3 cm, and enlarged porta hepatic lymph nodes measuring 1.6 × 1.6 cm (Figure 1).

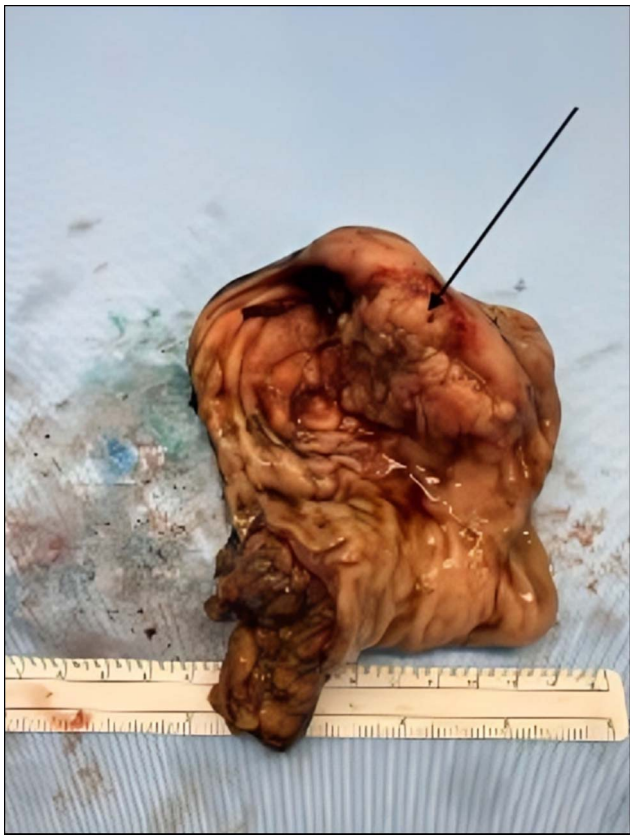

Figure 2. Gross pathology following gastric resection, notable for an 8.5 × 6.5 cm sessile polypoid mass along the previous Roux-en-Y staple line (arrow).

After volume resuscitation, the patient was taken to the operating room by surgery service for exploratory laparotomy. She was found to have a large intraluminal mass measuring 8.5 × 6.5 cm in the remnant stomach and underwent total remnant gastrectomy (Figure 2). The patient also underwent intraoperative upper GI endoscopy with evaluation of gastric pouch and roux limb revealing no masses, bleeding, or leak. The pathology of resected mass revealed poorly differentiated adenocarcinoma with positive margins and lymph nodes. Postoperatively, the patient did not have any further GI-related complications and was discharged 1 week later. Microsatellite instability analysis of the mass revealed high microsatellite instability status indicating deficient mismatch repair function. Further genetic testing was significant for germline mutation involving the MLH1 gene indicating Lynch syndrome. The patient followed up with the oncology service on an outpatient basis. She was classified to have pT4aN3M1/stage IV gastric cancer and was initiated on palliative immunotherapy with pembrolizumab. Genetic counseling referral was provided to the patient and her immediate family members for Lynch syndrome.

DISCUSSION

There are few reports on the development of malignancy in gastric remnant post RYGB surgery.[4,5] Thirty-nine percent of malignancies occurring post RYGB surgery involve the gastric remnant with a mean time of diagnosis approximately 9 years post surgery.[5,6] Chronic bile and alkaline reflux in the absence of food and gastric peristalsis, leading to a chronic inflammatory state, has been attributed to the development of malignancy in the remnant stomach.[5] The frequency of gastric cancer in Lynch syndrome is reported to range between 6% and 13%.[7] To our knowledge, there have been no cases of post-

RYGB gastric remnant malignancy with associated Lynch syndrome reported in the literature.

The patient presented with overt upper GI bleeding from adenocarcinoma originating from the remnant gastric stomach several years post bariatric RYGB surgery. Endoscopic workup remained inconclusive and imaging was not pursued in the previous admissions when the patient presented with GI bleeding. The diagnosis of gastric malignancy was delayed, and the malignancy was already at stage IV by the time of confirmation, indicating a less favorable prognosis. A strong family history, especially with the patient's mother being diagnosed with colorectal cancer before 60 years, could have led to genetic testing and diagnosis of Lynch syndrome earlier.

This case highlights the importance of presurgical evaluation including a detailed family history of GI and non-GI-related malignancies in patients undergoing high-risk surgical interventions such as RYGB. Early-stage gastric cancer is often asymptomatic or presents with subtle symptoms. This also raises the question of whether surveillance for gastric cancer is warranted post bariatric procedures. There are no current guidelines on gastric cancer surveillance post bariatric surgery. Endoscopic surveillance would be very challenging to evaluate the gastric remnant given the altered upper GI anatomy post RYGB. There are also mixed data on endoscopic surveillance of gastric cancer in patients diagnosed with Lynch syndrome.[7] Both American College of Gastroenterology and US Multi-Society Preventative Services Task Force guidelines recommend considering baseline esophagogastroduodenoscopy with biopsy for *Helicobacter pylori* starting at 30–35 years in patients affected by or at risk of Lynch syndrome.[8] The American College of Gastroenterology further provides a conditional recommendation of ongoing surveillance with upper GI endoscopy every 3–5 years in patients with Lynch syndrome and Lynch carriers with a family history of gastric or duodenal cancers.[9] In conclusion, the case of our patient with a history of RYGB who was diagnosed with gastric adenocarcinoma and Lynch syndrome several years later underscores the critical importance of screening and surveillance in the postoperative management of such individuals.

DISCLOSURES

Author contributions: A. Qazi: Manuscript creation; K. Mathur: Manuscript creation and revision; RD Rosen and A. Stroud: Image acquisition and manuscript revision; J. Webber and M. Mutchnick: Manuscript review and revision. M. Mutchnick and J. Webber are the article guarantors.

Financial disclosure: None to report.

Informed consent was obtained for this case report.

Received November 4, 2023; Accepted February 28, 2024

REFERENCES

1. Arterburn DE, Telem DA, Kushner RF, Courcoulas AP. Benefits and risks of bariatric surgery in adults: A review. *JAMA*. 2020;324(9):879–87.
2. Mala T. The gastric remnant in Roux-en-Y gastric bypass: Challenges and possibilities. *J Clin Gastroenterol*. 2016;50(7):527–31.
3. Biller LH, Creedon SA, Klehm M, Yurgelun MB. Lynch syndrome-associated cancers beyond colorectal cancer. *Gastrointest Endosc Clin N Am*. 2022;32(1):75–93.
4. Khneizer GW, Mahendraker N, Bick BL. Gastric adenocarcinoma of the remnant stomach presenting with a cystic intra-abdominal mass 11 years after Roux-en-Y gastric bypass. *ACG Case Rep J*. 2022;9(6):e00810.
5. Tornese S, Aiolfi A, Bonitta G, et al. Remnant gastric cancer after Roux-en-Y gastric bypass: Narrative review of the literature. *Obes Surg*. 2019;29(8):2609–13.
6. Chemaly R, Diab S, Khazen G, Al-Hajj G. Gastroesophageal cancer after gastric bypass surgeries: A systematic review and meta-analysis. *Obes Surg*. 2022;32(4):1300–11.
7. Boland CR, Yurgelun MB, Mraz KA, Boland PM. Managing gastric cancer risk in lynch syndrome: Controversies and recommendations. *Fam Cancer*. 2022;21(1):75–8.
8. Kim J, Braun D, Ukaegbu C, et al. Clinical factors associated with gastric cancer in individuals with lynch syndrome. *Clin Gastroenterol Hepatol*. 2020;18(4):830–7 e1.
9. Syngal S, Brand RE, Church JM, et al. ACG clinical guideline: Genetic testing and management of hereditary gastrointestinal cancer syndromes. *Am J Gastroenterol*. 2015;110(2):223–63; quiz 263.