



Afferent Loop Syndrome as Second Presentation of Gastric Outlet Obstruction in Patient With Billroth II Anatomy

Brenton G. Davis, MD¹, Alexis M. Bayudan, MD², and Abdul M. Kouanda, MD²

¹Department of Internal Medicine, University of California, San Francisco, San Francisco, CA

²Department of Gastroenterology, University of California, San Francisco, San Francisco, CA

ABSTRACT

Afferent loop syndrome can result from both benign and malignant strictures of the biliary limbs of patients with surgically altered anatomy. Afflicted patients accumulate intestinal and pancreaticobiliary secretions, which leads to bowel distention and pain. We describe the endoscopic management of a 52-year-old woman with a history of Billroth II gastrojejunostomy due to gastric cancer who developed malignant gastric outlet obstruction and subsequently malignant afferent loop syndrome, using lumen-apposing metal stents.

Key Words: afferent loop syndrome; Billroth II; gastric outlet obstruction

INTRODUCTION

Afferent loop syndrome (ALS) is a complication of Billroth II gastrojejunostomy (GJ), Roux-en-Y gastric bypass, and Whipple procedures.^{1,2} Common causes include malignant infiltration, internal hernias, postsurgical adhesions, or intrinsic/extrinsic compression causing obstruction.³ Symptoms include abdominal pain, distention, nausea, and vomiting. Historically, treatment involved surgical decompression and reconstruction and palliative chemotherapy if from malignancy; however, more recently endoscopic stenting has been at the forefront of management.⁴⁻⁷

CASE REPORT

A 52-year-old woman with a history of gastric adenocarcinoma status post subtotal gastrectomy with Billroth II GJ presented with clinical gastric outlet obstruction. An upper endoscopy was performed, which revealed a short-segment malignant obstruction of the anastomosis leading to the efferent limb. A 20 × 10 mm lumen-apposing metal stent (LAMS) was placed across the anastomosis without the use of cautery (“cold Axios”) leading to improvement in symptoms. Approximately 1 week later, she represented with acute abdominal pain, nausea, and nonbloody bilious vomiting. On admission, she was hypertensive but afebrile. Her laboratory results were notable for an elevated lipase.

A computed tomography scan showed a severely dilated afferent limb with a transition point adjacent to the site of local recurrence (Figure 1). The GJ stent was patent and draining into nondilated loops of bowel that were separate from the obstruction (Figure 2). An upper endoscopy was performed, which showed that the afferent limb anastomosis was obstructed because of tumor invasion. The adult gastroscope was unable to advance into the afferent limb. A balloon-tipped catheter and wire were used to access the afferent limb under fluoroscopic guidance. Contrast injection revealed the dilated afferent limb (Figure 3), which was situated parallel to the efferent limb. The linear echoendoscope was advanced through the GJ anastomosis LAMS into the efferent limb. The afferent limb, balloon, and wire were easily visualized (Figure 4). Under ultrasonographic and fluoroscopic guidance, a 15 × 10 mm LAMS was deployed using cautery, creating an afferent to efferent limb anastomosis. There was prompt drainage of bile. The LAMS was expanded to 10 mm using a through-the-scope dilating balloon (Figure 5). The position of the LAMS was confirmed fluoroscopically (Figure 6) and endoscopically. There were no postprocedure complications, and she was discharged on postprocedure day 2 able to tolerate a soft diet with resolutions of her symptoms.



Figure 1. Abdominal/pelvic computed tomography image of transition point adjacent to gastrojejunostomy sutures.

DISCUSSION

ALS is an infrequent complication of patients with surgically altered anatomy. In this unique case, the patient initially presented with gastric outlet obstruction and shortly after ALS, both successfully palliated with the use of lumen-apposing metal stents.



Figure 2. Abdominal/pelvic computed tomography image of patent gastrojejunostomy lumen-apposing metal stent without distal small bowel dilation.

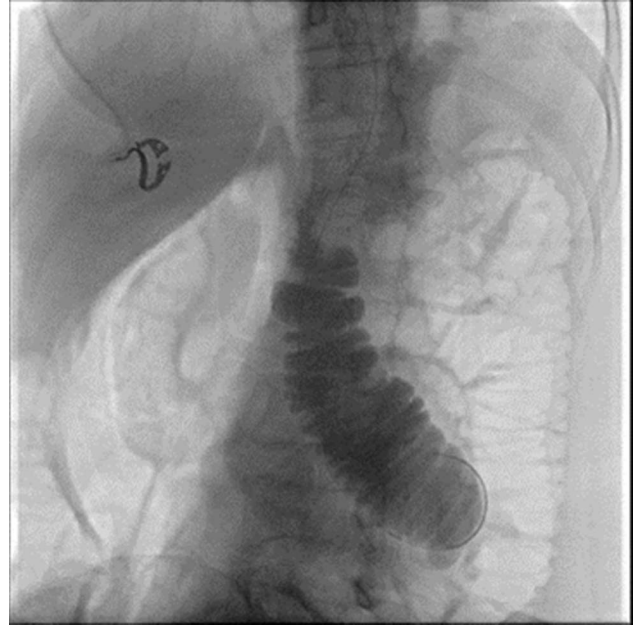


Figure 3. Wire access of the dilated afferent loop.

It is estimated that up to 1% of patients who have gastric procedures with Billroth II or Roux-en-Y reconstruction will develop ALS.⁸ Evaluation of ALS includes laboratory results and clinical condition, but computed tomography has become a staple in diagnosing ALS; magnetic resonance cholangiopancreatography can also be used to further elucidate the etiology of ALS if not clear from initial imaging.^{9,10}

Endoscopic management of ALS includes enteral stenting, percutaneous enterostomy, balloon dilation, and creation of a new GJ or jejunojunction.^{6,11} Recurrence of ALS is seemingly more common in those with a malignant etiology. Pannala et al¹² showed rates of recurrence were higher in patients who underwent balloon dilation or who received plastic stents in comparison with self-expanding metal stent. Given that endoscopic ultrasound-guided decompression has lower rates of

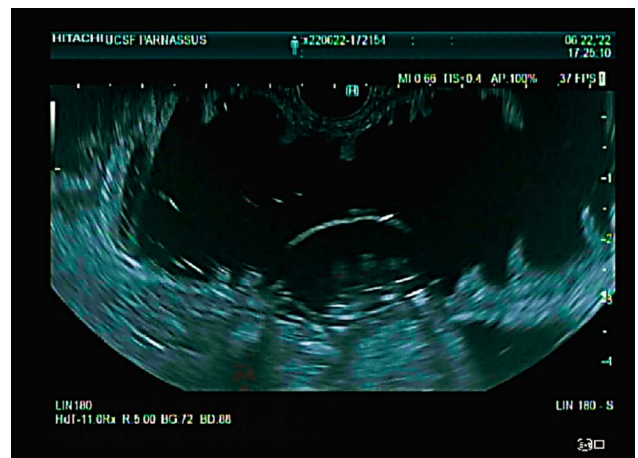


Figure 4. Endoscopic ultrasound image of afferent limb and balloon.

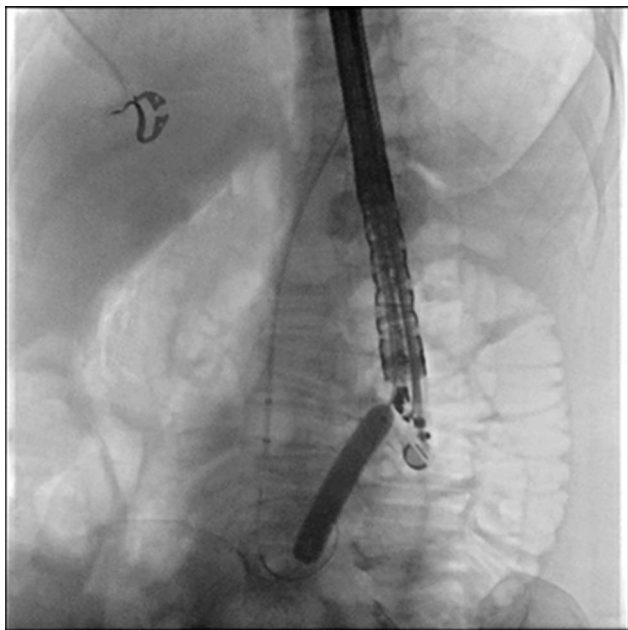


Figure 5. Balloon dilation of jejunojejunostomy lumen-approximating metal stent.

reintervention in comparison with transluminal stenting, we hope that this case highlights the feasibility of treating recurrent obstructions in patients with malignant ALS.¹³



Figure 6. Plain film of deployed gastrojejunostomy and jejunojejunostomy lumen-approximating metal stent.

DISCLOSURES

Author contributions: BG Davis: manuscript author, manuscript editing, data collection, and data analysis. A. Bayudan: manuscript editing and data collection. A. Kouanda: manuscript editing, and is the article guarantor.

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Informed consent was obtained for this case report.

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REFERENCES

1. Nageswaran H, Belgaumkar A, Kumar R, et al. Acute afferent loop syndrome in the early postoperative period following pancreaticoduodenectomy. *Ann R Coll Surg Engl.* 2015;97(5):349–53.
2. Kawamoto Y, Ome Y, Kouda Y, Saga K, Park T, Kawamoto K. Pancreaticoduodenectomy following gastrectomy reconstructed with Billroth II or Roux-en-Y method: Case series and literature review. *Int J Surg Case Rep.* 2017;35:106–9.
3. Katagiri H, Tahara K, Yoshikawa K, Lefor AK, Kubota T, Mizokami K. Afferent loop syndrome after Roux-en-Y total gastrectomy caused by volvulus of the Roux-limb. *Case Rep Surg.* 2016;2016:4930354.
4. Grotewiel RK, Cindass R. Afferent loop syndrome. In: *StatPearls [Internet]*. StatPearls Publishing: Treasure Island, FL, 2021.
5. Katagiri H, Tahara K, Yoshikawa K, Lefor AK, Kubota T, Mizokami K. Afferent loop syndrome after Roux-en-Y total gastrectomy caused by volvulus of the Roux-limb. *Case Rep Surg.* 2016;2016:4930354.
6. Blouhos K, Boulas KA, Tsalis K, Hatzigeorgiadis A. Management of afferent loop obstruction: Reoperation or endoscopic and percutaneous interventions? *World J Gastrointest Surg.* 2015;7(9):190–5.
7. Blachar A, Federle MP, Pealer KM, Ikramuddin S, Schauer PR. Gastrointestinal complications of laparoscopic Roux-en-Y gastric bypass surgery: Clinical and imaging findings. *Radiology.* 2002;223(3):625–32.
8. Cao Y, Kong X, Yang D, Li S. Endoscopic nasogastric tube insertion for treatment of benign afferent loop obstruction after radical gastrectomy for gastric cancer: A 16-year retrospective single-center study. *Medicine (Baltimore).* 2019;98(28):e16475.
9. Tonolini M, Bracchi E. Early postoperative imaging after non-bariatric gastric resection: A primer for radiologists. *Insights Imaging.* 2017;8(4):393–404.
10. Takata K, Anan A, Umeda K, Sakisaka S. Magnetic resonance cholangiopancreatography for afferent loop syndrome. *Clin Case Rep.* 2019;7(3):591–2.
11. Termsinsuk P, Chantarojanasiri T, Pausawasdi N. Diagnosis and treatment of the afferent loop syndrome. *Clin J Gastroenterol.* 2020;13(5):660–8.
12. Pannala R, Brandabur JJ, Gan SI, et al. Afferent limb syndrome and delayed GI problems after pancreaticoduodenectomy for pancreatic cancer: Single-center, 14-year experience. *Gastrointest Endosc.* 2011;74(2):295–302.
13. Brewer Gutierrez O, Irani S, Ngamruengphong S, et al. Endoscopic ultrasound-guided entero-enterostomy for the treatment of afferent loop syndrome: A multicenter experience. *Endoscopy.* 2018;50(9):891–5.

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