A Rare Post-Gastrectomy Complication: Efferent Loop Volvulus

Abstract

Efferent loop syndrome (ELS) is a rare post-gastrectomy complication that may occur after **Billroth II** or **Roux-en-Y reconstruction**. It is much less frequent than afferent loop syndrome but can lead to severe clinical manifestations requiring prompt surgical management.

We report a case of **efferent loop syndrome secondary to volvulus of the alimentary limb** in a patient who had previously undergone a **partial gastrectomy with Billroth II gastrojejunostomy**. The patient presented with acute intestinal obstruction, and imaging revealed a distended alimentary loop with signs of ischemia.
Surgical exploration confirmed a **volvulated and necrotic efferent loop**, which was resected, followed by a **new Billroth II anastomosis**. Postoperative recovery was uneventful.

Efferent loop syndrome should be considered in the differential diagnosis of any post-gastrectomy patient presenting with obstructive symptoms. While **surgery** remains the mainstay of treatment, **endoscopic or palliative approaches** may be an option in selected patients.

Keywords

efferent loop syndrome, volvulus, Billroth II, gastric surgery, small bowel obstruction

Introduction

Gastric cancer remains one of the most prevalent malignancies worldwide, with nearly **one million new cases diagnosed each year**, ranking as the **fourth most common cancer** globally [1].
Surgical resection, often combined with chemotherapy and radiotherapy, remains the cornerstone of curative treatment. Despite major advances in minimally invasive surgery, **gastrectomy** is still associated with significant postoperative morbidity and mortality [2].

Among the various postoperative complications, **loop syndromes** are uncommon but potentially serious. **Efferent loop syndrome (ELS)** is a rare mechanical obstruction of the **alimentary limb** occurring **downstream from a Billroth II or Roux-en-Y anastomosis** [3,4].
It is **less frequent than afferent loop syndrome** and may occur either **early**, due to

anastomotic edema or kinking, or **late**, due to adhesions, strictures, intussusception, internal hernias, or **volvulus**, as in our case [5,6].

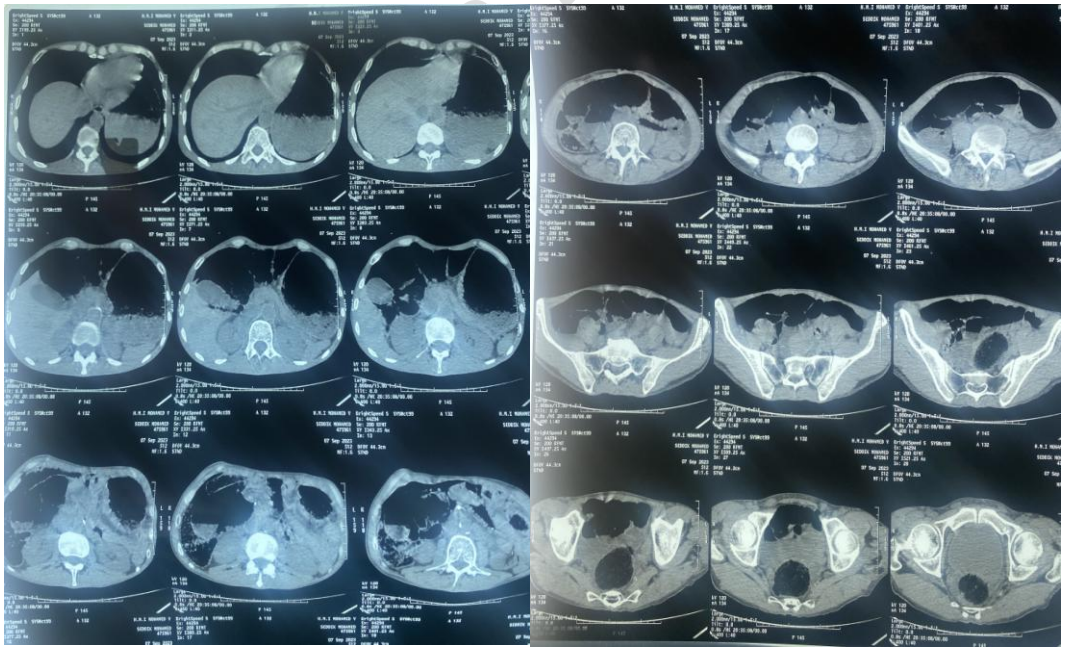
We present a case of **acute efferent loop syndrome secondary to volvulus of the alimentary limb** following a Billroth II reconstruction, highlighting its clinical presentation, diagnostic challenges, and therapeutic management.

2. Case Presentation

A 46-year-old man with a history of a neuroendocrine gastric tumor with liver metastases, who had previously undergone a partial gastrectomy with Billroth II gastrojejunostomy three years ago, was admitted to the emergency department with abdominal pain, vomiting, and cessation of bowel movements and gas. One week earlier, he had undergone thermal ablation for his liver metastases.

Clinical examination revealed a patient in good general condition, afebrile, with a distended and tender abdomen.
Laboratory tests showed leukocytosis (11,000/mm³), hemoglobin at 8 g/dL, and an elevated CRP of 18.7 mg/L.

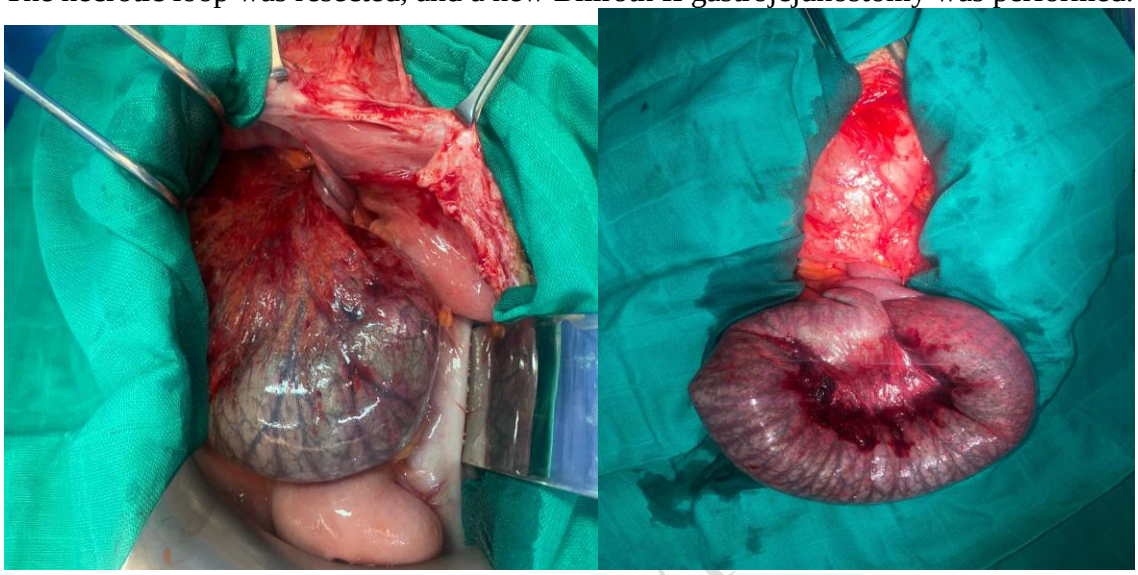
An abdominal X-ray revealed central air-fluid levels, and a contrast-enhanced CT scan demonstrated pneumoperitoneum, gastric stasis, and a distended alimentary loop measuring 40 mm in thickness, suggestive of a bowel perforation [5].



Figures 1 and 2.
Contrast-enhanced abdominal CT scan showing jejunal distension

upstream of the gastrojejunostomy with gastric stasis and pneumoperitoneum, suggesting bowel obstruction due to volvulus.

Emergency surgery was performed, revealing a necrotic volvulus of the alimentary loop. The necrotic loop was resected, and a new Billroth II gastrojejunostomy was performed.



Figures 3 and 4.
Intraoperative view showing a volvulus of the efferent (alimentary) loop with extensive necrosis of the involved intestinal segment.

Discussion

- ### Pathophysiology and Diagnosis

Efferent loop syndrome (ELS) refers to a **mechanical obstruction** occurring **distally to a Billroth II gastrojejunostomy**. It is a rare condition compared with **afferent loop syndrome**, and may present either **acutely** or **chronically** depending on the underlying cause [6].

The decreasing incidence of ELS in recent years is linked to the **decline in the use of Billroth II reconstructions**, replaced by Roux-en-Y techniques that better preserve intestinal continuity [7].

Early postoperative obstruction is usually due to **edema, kinking, or technical issues** at the anastomotic site. In contrast, late-onset obstruction most commonly results from **adhesions, strictures, internal hernias, intussusception**, or, rarely, **volvulus of the alimentary limb** [8].

Clinical manifestations vary from mild postprandial discomfort to acute intestinal obstruction with vomiting, abdominal distension, and cessation of bowel movements. The differential diagnosis includes **afferent loop syndrome, anastomotic stricture, or tumor recurrence**.

Imaging, particularly **contrast-enhanced CT**, is crucial for diagnosis. It demonstrates **dilatation of the efferent limb**, signs of **ischemia or necrosis**, and helps distinguish it from afferent loop obstruction. **Multiplanar CT reconstructions**are particularly helpful for evaluating postoperative anatomy [9,10].

- ## Treatment Options

The management of **efferent loop syndrome** depends on the **underlying cause** and the **clinical severity**.
In cases of **complete obstruction** or when **ischemia** is suspected, **surgical intervention** is mandatory [11].

Surgicalstrategiesinclude:

- **Resection of the necrotic segment** with reconstruction via a new **Billroth II anastomosis** (as in our case),
- **Conversion to a Billroth I anastomosis**, or
- **Jejunojejunostomy** to bypass the obstructed segment [12].

When the obstruction is caused by **anastomotic edema**, **mild adhesions**, or **inflammatory changes**, **conservative management** may be attempted. This mayinvolve:

- **Nasogastricdecompression**,
- **Proton pumpinhibitors**,
- **Total parenteral nutrition**, and
- Carefulclinical monitoring.

In patients unfit for surgery, **endoscopic stent placement** can be considered as a **palliative option** to relieve obstruction [13].

In our case, exploratory laparotomy revealed a **volvulus of the efferent (alimentary) limb** caused by an **adhesive band**, resulting in **necrosis**. Resection of the affected segment and reconstruction of a new Billroth II anastomosis led to full recovery.

Conclusion

Efferent loop syndrome is a rare but potentially life-threatening complication following Billroth II reconstruction. Among its various etiologies, volvulus of the alimentary limb

represents an exceptional cause that should be considered in patients presenting with acute bowel obstruction after gastrectomy. Early recognition based on clinical suspicion and radiological findings is essential to prevent ischemic complications.

Surgical exploration remains the cornerstone of management, as it allows both confirmation of the diagnosis and definitive treatment through resection of the necrotic loop and reconstruction of the anastomosis[14]. Although endoscopic or conservative approaches may be used in selected cases, prompt surgical intervention offers the best outcomes in cases of volvulus or complete obstruction.

Our case highlights the importance of considering efferent loop syndrome in the differential diagnosis of post-gastrectomy obstructions and illustrates how a volvulus of the alimentary limb can lead to this uncommon but severe condition requiring urgent surgical treatment[15].

References

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. *Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries.* CA Cancer J Clin. 2018;68(6):394-424.
2. Cunningham D, Allum WH, Stenning SP, et al. *Perioperative chemotherapy versus surgery alone for resectable gastroesophageal cancer.* N Engl J Med. 2006;355(1):11-20.
3. Kim HC, Han JK, Kim KW, et al. *Afferent loop syndrome: CT and MR imaging findings.* Radiology. 2003;228(3):677-682.
4. Zissin R, Osadchy A, Gayer G, et al. *CT findings of afferent loop syndrome after subtotal gastrectomy with Roux-en-Y reconstruction.* Emerg Radiol. 2004;10:201-203.
5. Yilmaz S, Yekeler E, Dural C, et al. *Afferent loop syndrome secondary to Billroth II gastrojejunostomy obstruction: Multidetector computed tomography findings.* Surgery. 2007;141(4):538-9.
6. Gómez MA, Besson M, Garnier S, Scotto B, Alison D. *Afferent loop syndrome.* Feuill Radiol. 2004;44:187-192.
7. Chevallier P, Gueyffier C, Souci J, Oddo F, Dain A, Padovani B. *MRI diagnosis of afferent loop syndrome presenting as obstructive jaundice.* J Radiol. 2001;82:177-9.
8. Takagi K, Hata N, Fujii Y. *A Rare Cause of Afferent Loop Syndrome.* Gastro Hep Advances. 2023;2(3):281–282.
9. Konaté I, Ba PA, Tendeng J, et al. *Afferent loop syndrome after Roux-en-Y hepaticojejunal anastomosis: A case report.* J Afr Chir. 2011;1(3):185-187
10. Dias AR, Lopes RI. *Biliary stone causing afferent loop syndrome and pancreatitis.* World J Gastroenterol. 2006;12:6229-6231.

11. Zissin R, Gayer G, Parag Y, et al. *Clinical and imaging findings of afferent loop syndrome.*Clin Radiol. 2002;57(10):835-842.
12. Shimamura K, Otani T, Yamazaki T, et al. *Jejunal loop obstruction by a gallstone from hepaticojejunostomy-induced acute cholangitis: Report of a case.* Surg Today. 2006;36:737-740.
13. Sato R, Shibata C, Sasaki I, et al. *Endoscopic management of efferent loop obstruction using double pigtail stent placement after Billroth II gastrectomy*. SurgEndosc. 2008;22(4):1082–1085.
14. Kikuchi S, Nishizaki M, Kuroda S, et al. *Surgical management of postgastrectomy complications: A review of current strategies.* World J GastrointestSurg. 2020;12(10):406–418.
15. Yang H, Li T, Wang J, et al. *Efferent loop syndrome after Billroth II gastrectomy: A case report and literature review*.Medicine (Baltimore). 2022;101(17):e29360.