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Refractory Bile Reflux Following Single-Anastomosis Duodeno-Ileal Bypass with Sleeve Gastrectomy: Diagnostic Limitations and Revisional Management

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1. Introduction

Single-anastomosis duodeno-ileal bypass with sleeve gastrectomy (SADI-S) has gained increasing acceptance as a metabolic bariatric procedure due to its technical simplicity, reduced operative time, and favourable weight loss and metabolic outcomes when compared with traditional biliopancreatic diversion with duodenal switch (BPD/DS) [1]. Despite these advantages, the loop configuration inherent to SADI-S has raised concerns regarding bile reflux and duodenogastric reflux in select patients [2]. Although the reported incidence is relatively low, clinically significant bile reflux can be severe, difficult to diagnose, and nutritionally devastating.

Diagnosis of bile reflux remains challenging, as commonly utilized reflux testing modalities may fail to identify bile exposure confined to the gastric sleeve. Standard pH monitoring and pH-impedance testing are designed primarily to detect reflux events that reach the distal esophagus [3]. As a result, patients may continue to experience significant symptoms despite negative or equivocal objective testing. We present a case of refractory bile reflux following SADI-S highlighting diagnostic limitations, the importance of clinical judgment, and the role of revisional surgery and nutritional rescue.

2. Case Presentation

A 50-year-old female underwent SADI-S in November 2024 for management of morbid obesity. Her immediate postoperative course was uncomplicated, and she initially demonstrated appropriate recovery. Approximately one year following surgery, she developed progressive gastrointestinal symptoms including persistent nausea, frequent vomiting of yellow bilious material, anorexia, and inability to tolerate oral intake. Over time, these symptoms resulted in failure to thrive with progressive nutritional decline. The patient denied dysphagia or odynophagia but reported daily nausea and recurrent bilious emesis, particularly following attempts at oral intake. Given the severity and persistence of symptoms, further evaluation was initiated.

3. Diagnostic Evaluation

Upper endoscopy demonstrated pooling of bile within the gastric sleeve. There was no evidence of sleeve stenosis, anastomotic narrowing, marginal ulceration, or mechanical obstruction. The duodenal anastomosis appeared patent. These findings raised concern for symptomatic bile reflux in the setting of SADI-S anatomy.

Evaluation of bile reflux following SADI-S presents inherent diagnostic challenges. While pH monitoring and pH-impedance testing are frequently utilized to assess non-acid reflux, these modalities primarily detect reflux episodes that reach the distal esophagus [3]. Patients may therefore have clinically significant bile reflux confined to the gastric sleeve despite negative impedance testing [3]. In this patient, the endoscopic presence of bile within the sleeve combined with bilious emesis and progressive malnutrition was felt to be highly suggestive of clinically meaningful bile reflux. Medical therapy, including bile acid sequestrants such as cholestyramine, may provide symptomatic relief and serve as a useful clinical indicator of bile-mediated pathology when diagnostic testing is inconclusive [4]. However, given the patient's worsening nutritional status and inability to tolerate oral intake, definitive surgical management was pursued.

4. Management

After multidisciplinary discussion and consideration of the patient's symptoms, nutritional decline, and anatomic findings, the decision was made to proceed with revisional surgery. The patient underwent conversion from SADI-S to traditional BPD/DS with the goal of redirecting biliopancreatic flow and reducing bile exposure to the gastric sleeve [5]. The loop configuration was eliminated, and a Roux-type alimentary pathway was restored. The procedure was completed without intraoperative complications.

5. Postoperative Course

Following revision, the patient experienced limited initial symptomatic improvement. She continued to struggle with poor oral intake and developed significant malnutrition. Due to ongoing nutritional compromise, a nasoileal feeding tube was placed to provide enteral nutritional support. The patient required prolonged nasoileal tube feeding for several months with close outpatient follow-up. With sustained nutritional optimization, gradual reintroduction of oral intake, and continued multidisciplinary care, the patient demonstrated progressive clinical improvement. Her nausea and bilious vomiting resolved, appetite improved, and she was ultimately able to discontinue enteral tube feeding. At most recent follow-up, the patient is tolerating oral intake, maintaining nutritional status, and reports significant improvement in quality of life. A postoperative upper gastrointestinal study demonstrated appropriate postoperative anatomy without evidence of obstruction.

6. Discussion

This case highlights several important considerations in the evaluation and management of bile reflux following SADI-S. Although SADI-S offers many advantages, its loop configuration may allow retrograde bile flow into the gastric sleeve, leading to clinically significant symptoms in select patients [2]. While the true incidence of severe bile reflux remains unclear, affected patients may experience profound symptoms and nutritional deterioration. A key teaching point demonstrated by this case is the limitation of pH-impedance testing. These studies are designed to detect reflux episodes reaching the esophagus and may fail to identify bile reflux confined to the gastric sleeve [3]. As such, negative impedance testing does not exclude clinically significant bile reflux. Endoscopic visualization of bile within the sleeve, particularly in patients with bilious emesis and failure to thrive, should prompt consideration of bile-mediated pathology. Medical therapy with bile acid sequestrants such as cholestyramine may provide symptomatic improvement and can serve as a practical adjunct in diagnosis and management [4]. However, patients with refractory symptoms and progressive malnutrition may require revisional surgery. Conversion to traditional BPD/DS can effectively redirect biliopancreatic flow but may not result in immediate symptomatic resolution. Aggressive nutritional support, including prolonged enteral feeding, is often essential to allow recovery.

7. Conclusion

Severe bile reflux following SADI-S, though uncommon, can be nutritionally devastating and difficult to diagnose. pH-impedance testing may fail to detect clinically significant bile reflux confined to the gastric sleeve. Endoscopic findings, symptom profile, and clinical judgment remain critical. Revisional surgery combined with aggressive nutritional rescue can result in meaningful recovery and symptom resolution.

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