Postgastrectomy Syndromes and Nutritional Considerations Following Gastric Surgery

Jeremy L. Davis, MD*, R. Taylor Ripley, MD

KEYWORDS

• Postgastrectomy syndromes • Nutritional deficiencies • Dumping • Bile reflux
• Roux-en-Y

KEY POINTS

- Postgastrectomy syndromes are common sequelae of surgery for gastric cancer.
- Dumping syndrome is a common postgastrectomy complication diagnosed in the presence of classic symptoms and appropriate clinical history.
- Afferent and efferent loop syndromes most often require operative intervention for syndrome resolution.
- Nutritional deficiencies and perioperative nutritional supplementation are common, especially after total gastrectomy.

INTRODUCTION

Late postoperative complications of gastrectomy may present as a constellation of symptoms and signs referred to as postgastrectomy syndromes. These syndromes result from alterations in anatomy and function of the stomach and proximal small intestine. Although some syndromes occur in isolation, patients may present with various symptoms that warrant a thorough understanding of both cause and treatment. Historically, elective operations for both benign and malignant disorders of the stomach provided surgeons with experience in recognition and treatment of these syndromes. Elective operation for peptic ulcer disease has declined dramatically and is associated with both decreased prevalence and familiarity with postgastrectomy syndromes.[1–3] Meanwhile, bariatric surgery volume has grown substantially, making it the most likely cause of postgastrectomy syndromes and nutritional deficiencies.[4–6] The low incidence of gastric cancer in the western hemisphere also suggests that variations in the resection and reconstruction that are reported to prevent or treat

Surgical Oncology Section, Thoracic & Gastrointestinal Oncology Branch, National Cancer Institute, 10 Center Drive, MSC1201, Room 4-3940, Bethesda, MD 20892, USA
* Corresponding author.
E-mail address: Jeremy.Davis@nih.gov

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postgastrectomy syndromes are doubtful routine for surgeons performing gastrectomy for malignancy in the United States.[7] This article focuses on the cause, diagnosis, and treatment of classic postgastrectomy syndromes (Table 1) and nutritional considerations in patients with gastric cancer.

ANATOMY AND PATHOPHYSIOLOGY

The proximal and distal stomach, including the pylorus, has separate and distinct functions, including storage, mechanical breakdown, preliminary digestion, and emptying of food. Extrinsic and intrinsic innervation of the stomach, endocrine and paracrine signaling, and duodenogastric feedback each provide coordinated control of normal gastric function. The proximal stomach undergoes vagal-mediated receptive relaxation and accommodation during ingestion of a meal and generates tonic contractions to aid in transport of contents to the distal stomach. The distal stomach produces slow-wave, circumferential contractions (3 per minute) that result in the transport and mechanical trituration of large food particles.[8] Control of gastric emptying varies based on the pressure gradient between the stomach and duodenum and resistance to flow across the pylorus, signaling via various gastrointestinal hormones, and coordinated duodenal contractions. Even though parasympathetic vagal innervation speeds gastric emptying, the effect of vagotomy on emptying is variable depending on the level of transection of the vagi and associated gastric resection, specifically related to the elimination of the antrum and pylorus.[9] Emptying of liquids occurs before solids and is aided by tonic contraction of the proximal stomach.[10] Thus, vagotomy can eliminate the receptive relaxation and accommodation of the proximal stomach and may result in more rapid emptying of liquids. Digestible solid food is retained until the mechanical process reduces particles to 1 mm followed by the coordinated transport of chyme into the duodenum. Loss of truncal vagal tone releases normal suppression of antral pacemakers and can therefore disrupt normal emptying; in contrast, highly selective vagotomy (parietal cell vagotomy) induces

Table 1
Postgastrectomy syndromes

Syndrome	First-line Therapy	Second-line Therapy
Dumping	Dietary modifications	Roux-en-Y gastrojejunostomy
Small gastric remnant	Dietary modifications	Jejunal pouch[a]
Postvagotomy diarrhea	Dietary modification	Antiperistaltic jejunal segment
Delayed gastric emptying/gastric atony	Prokinetic medication	Completion gastrectomy, conversion to Roux-en-Y
Afferent loop syndrome	Address obstruction based on cause	Roux-en-Y gastrojejunostomy
Efferent loop syndrome	Assess obstruction based on cause	None
Roux stasis	Completion gastrectomy, Roux-en-Y gastrojejunostomy	Feeding jejunostomy
Bile reflux gastritis	Attempt medical therapy (eg, cholestyramine)	Roux-en-Y gastrojejunostomy; Braun enteroenterostomy; jejunal interposition

[a] Not advocated routinely.