

Clinical Research and Integrated Management of Post-surgical Gastroparesis after Colon Cancer Resection

Juyi Li¹, Lihong Ka¹, Jingwen Chen², Xiang Wang³, Xin Wei¹, Pengfei Hu^{4*}

¹Nursing College of Gansu Medical College, Pingliang 744000, Gansu, China

²Public Health, Gansu Medical College, Pingliang 744000, Gansu, China

³Clinical Medicine of Gansu Medical College, Pingliang 744000, Gansu, China

⁴Mi Huangfu College of Gansu Medical College, Pingliang 744000, Gansu, China

**Author to whom correspondence should be addressed.*

Copyright: © 2026 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: Postsurgical gastroparesis syndrome (PGS) is a gastric motility disorder with non-mechanical gastric outlet obstruction that occurs following colon cancer resection. Although its incidence is said to be less than that of post-upper abdominal surgeries, its onset may cause a significant delay in postoperative progress and prolong hospitalization, and could also potentially delay the initiation of adjuvant chemotherapy. In this review, we present a systematic overview of the etiological mechanisms, diagnostic modalities, possible prevention, and a comprehensive Therapeutic approach for PGS in the context of colon cancer, putting a special emphasis on the possible detrimental impact of lymphadenectomy on the perigastric neural innervation and vascular supply in right-sided colon cancer procedures. We endeavor to provide practical references for the early clinical recognition and the standardized management of this challenging complication.

Keywords: Gastroparesis syndrome; Colon cancer; Integrated therapeutic strategy; Postoperative complications

Online publication: Aug 21, 2026

1. Introduction

PGS is a functional disorder with the main symptom being delayed gastric emptying after abdominal surgery, except when there is a mechanical obstruction of the gastric outlet, which is ruled out by an adequate diagnostic workup. It is more often recognized after upper abdominal surgery – gastric, duodenal, or pancreatic resection^[1]. This syndrome can occur after colon cancer surgery, with early satiety, nausea and vomiting, abdominal distension, and epigastric pain. By neglecting an adequate nutritional intake, PGS delays postoperative recovery, causes a significant increase in the cost of care, and could even lead to potentially fatal complications. In particular, the need for right-sided colon cancer to undergo a radical resection almost always involves clearing the No. 6 (subpyloric) lymph nodes, which necessitates a transection of the

gastrocolic ligament and a mobilization of the right gastroepiploic vessels ^[2].

2. Etiology and pathogenesis

The precise etiology of PGS after colon cancer surgery is not yet fully explained, and it is considered, at present, to be a multifactorial condition caused by the combination of various pathogenic mechanisms. Neural dysregulation is one of the central mechanisms. Antral contraction relies on extrinsic vagal innervation and intrinsic cholinergic neuronal mediation. Surgical trauma could also over-activate the sympathetic nervous system, and the inhibitory reflex suppresses the gastric myoelectric activity ^[3]. At the same time, the division of the gastrocolic ligament and the dissection of the No.6 lymph nodes in right-sided colon cancer procedures may directly damage perigastric vagal ramifications, thus disturbing the coherent antro-pyrophoric motor pattern ^[4].

Dysfunction of interstitial cells of Cajal (ICC) also attracts much research interest. ICCs are pacemaker cells that generate gastric electrical slow waves and are in charge of transmitting neural signals to smooth muscle cells. Mechanical traction on the greater curvature and reduced local blood flow at the time of colon cancer surgery might decrease the density of ICCs and induce structural atrophy so that slow waves do not propagate far enough to reach the threshold potential, leading to slow transit and delayed gastric emptying ^[5]. An imbalance in gastrointestinal hormones as well as changes in the local microenvironment take part in pathogenesis ^[6].

3. Diagnostic modalities and criteria

The diagnosis of PGS requires a strict exclusion-based logic. Firstly, organic lesions: anastomotic stenosis, efferent loop obstruction, reflux from the gastroesophageal junction, or jejunogastric intussusception have to be excluded by means of gastroscopy and upper gastrointestinal barium study. Second, a secondary gastric smooth muscle dysfunction from a systemic disorder such as hypothyroidism, systemic sclerosis, dermatomyositis, Parkinson's disease, cerebrovascular accident, etc has to be excluded ^[7].

After the above conditions have been ruled out, the following procedures may be used to assess gastric emptying function. Gastric emptying scintigraphy remains the gold standard of reference in which patients swallow a solid test meal radiolabeled with technetium-99m (^{99m}Tc) and sequential images are obtained at 0, 1, 2, and 4 hours postprandially; retention greater than 10% at 4 hours is considered diagnostic of delayed emptying ^[8]. The ¹³C breath test relies on stable isotope-labeled substrates, and gastric emptying time is estimated indirectly based on enrichment of ¹³CO₂ in expired breath. The test is radiation-free and operationally straightforward, but is subject to metabolic confounding factors. The wireless motility capsule continuously monitors pH, temperature, and pressure, and a gastric emptying time of more than 5 hours is considered delayed transit ^[9]. With high sensitivity, this modality is also expensive and a significant limitation ^[10].

4. Preventive measures

For patients scheduled for an elective surgery, the use of preoperative chewing gum and psychological counseling is advised in order to reduce perioperative stress. For patients with high-risk features like advanced age, diabetes mellitus, or poor nutritional status, a risk-based management protocol should be

considered. Preoperatively, measures should be taken to improve the nutritional status and to correct anemia and hypoalbuminemia. Intraoperatively, one should advocate careful surgical technique with minimization of the operative time, and one can consider prophylactic placement of a nasojejunal feeding tube on a case-by-case basis ^[11]. Postoperatively, one should avoid any operative delay in resumption of oral feeding, and close surveillance for abdominal symptoms is required; whenever upper abdominal discomfort appears, early nasogastric tube decompression should be performed together with early onset of nutritional support.

5. Therapeutic strategies

The management of PGS after colon cancer surgery is mainly conservative and supportive, with a therapeutic objective to relieve gastric retention, stabilize fluid and electrolyte balance, and manage the nutritional status. Fasting and continuous nasogastric decompression are the main components of basic supportive care to diminish gastric wall edema on the one hand and to stabilize the internal milieu on the other hand. Nutritional care is the central part of the management. Total parenteral nutrition can be used during the first phase to cover metabolic needs and to shut down the secretion of the digestive system; when symptoms are resolved and the functioning of the intestinal tract is resumed, enteral nutrition should be switched to in a timely manner to prevent damage to the intestinal mucosal barrier ^[12].

6. Conclusions and future perspectives

Postsurgical gastroparesis after colon cancer resection, although not rare, is a complication of major clinical impact. Its pathogenesis is the result of a combination of neural injury, ICC dysfunction, endocrine derangements, and individual predisposing factors. The diagnostic cornerstone is to rigorously exclude mechanical obstruction and systemic diseases, while the therapeutic paradigm relies on a stepwise and individualized approach, from simple supportive care and nutritional management to pharmacotherapy, endoscopic, and also surgical procedures in selected cases. Several issues should receive further attention ^[13]. First, optimal strategies to maintain perigastric neural integrity and vascular supply during right-sided colectomy are still to be determined. Second, the choice and the duration of the pharmacological regimens do not have strong high-level evidence. Third, the appropriate patient population for the emerging techniques such as G-POEM in the specific case of post-colon cancer gastroparesis has not yet been well established ^[14]. More efforts should be devoted to establishing uniform diagnostic and treatment algorithms, implementing the predictive model to screen high-risk people early, and further research into the integrated treatment of Western and traditional Chinese medicine, the ultimate goal of which is to accelerate enhanced recovery after surgery ^[15].

Disclosure statement

The authors declare no conflict of interest.

References

- [1] Qian Z, Wu D, Zhu C, et al., 2026, Case Report: Case of Wernicke's Encephalopathy Complicated by

Postoperative Gastroparesis Following Sigmoid Colon Malignant Tumor Surgery with a Literature Review. *Frontiers in Oncology*, 16: 1715017.

- [2] Grüter A, Vlug M, Spaanderman I, et al., 2024, Challenging Case of Deficient Mismatch Repair Right-Sided Locally Advanced Adenocarcinoma of the Ascending Colon with Duodenal Involvement: A Case Report Including Step-by-Step Video of Operation. *International Journal of Surgery Case Reports*, 114: 109137.
- [3] Wang G, Pan S, 2025, Factor Analysis of Postsurgical Gastroparesis Syndrome After Right Hemicolectomy for Colon Cancer. *Oncology Letters*, 29(3): 154.
- [4] Stormark K, Krarup P, Sjövall A, et al., 2020, Anastomotic Leak After Surgery for Colon Cancer and Effect on Long-Term Survival. *Colorectal Disease*, 22(9): 1108–1118.
- [5] Yde J, Larsen H, Laurberg S, et al., 2018, Chronic Diarrhea Following Surgery for Colon Cancer-Frequency, Causes and Treatment Options. *International Journal of Colorectal Disease*, 33(6): 683–694.
- [6] Lundqvist E, Westberg K, Boman S, et al., 2025, Outcome After Surgery for Colon Cancer in a National Cohort of Patients with and Without Inflammatory Bowel Disease. *Alimentary Pharmacology & Therapeutics*, 62(11–12): 1181–1191.
- [7] Guraya S, 2019, Pattern, Stage, and Time of Recurrent Colorectal Cancer After Curative Surgery. *Clinical Colorectal Cancer*, 18(2): e223–e228.
- [8] Lin Y, Cheng H, Huang S, et al., 2022, Comparison of Two-Stage and Three-Stage Surgery for Obstructing Left-Sided Colon Cancer. *ANZ Journal of Surgery*, 92(6): 1466–1471.
- [9] Ketelaers S, Fahim M, Rutten H, et al., 2020, When and How Should Surgery Be Performed in Senior Colorectal Cancer Patients? *European Journal of Surgical Oncology*, 46(3): 326–332.
- [10] Scheepers E, Vink G, Schiphorst A, et al., 2023, Health-Related Quality-of-Life Trajectories During/After Surgery and Adjuvant Chemotherapy in Patients with Colon Cancer. *European Geriatric Medicine*, 14(3): 565–572.
- [11] Sier M, Gielen A, Tweed T, et al., 2024, Accelerated Enhanced Recovery After Colon Cancer Surgery with Discharge Within One Day After Surgery: A Systematic Review. *BMC Cancer*, 24(1): 102.
- [12] Biondo S, Gálvez A, Ramírez E, et al., 2019, Emergency Surgery for Obstructing and Perforated Colon Cancer: Patterns of Recurrence and Prognostic Factors. *Techniques in Coloproctology*, 23(12): 1141–1161.
- [13] Khan M, Cahill R, 2021, Perioperative Personalized Decision Support and Analytics for Colon Cancer Surgery: Short Report. *European Journal of Surgical Oncology*, 47(2): 477–479.
- [14] Chi P, Huang S, 2022, Delayed Gastric Emptying After Surgery for Transverse Colon Cancer: Diagnosis, Management and Prevention. *Chinese Journal of Gastrointestinal Surgery*, 25(6): 493–499.
- [15] Jiménez I, Pacha M, Pares D, et al., 2019, Survival and Quality of Life After Surgery for Colorectal Cancer in the Elderly: A Comparative Study. *Revista Española de Enfermedades Digestivas*, 111(3): 193–198.

Publisher's note

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.