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RESEARCH ARTICLE

Gastroenterology integration in specialized clinics for late complications after colorectal cancer surgery

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ABSTRACT

The integration of gastroenterology expertise in clinics managing late complications of colorectal and anal cancer surgery is an advancement in patient care. This paper explores the multifaceted role of gastroenterologists in such settings, emphasizing diagnostic evaluation, personalized treatment planning, and the management of complex gastrointestinal symptoms. There is an obvious necessity for gastroenterological expertise to address complex issues such as diarrhea, malabsorption, discomfort, pain, bleeding, and incontinence, which are frequently under-treated in routine colorectal surgical outpatient care. In the article, we give recommendations for initial assessment, diagnostic workup, treatment strategies, follow-up, and monitoring of these issues. Highlighting the importance of a multidisciplinary approach, we discuss how gastroenterologists contribute to improved treatment outcomes and patient quality of life after surgery for colorectal and anal cancer.

Keywords: Gastroenterologists, postoperative complications, colorectal cancer surgery, diagnostic tools, bile acid malabsorption, small intestinal bacterial overgrowth, integrated care model, patient-centered care

Introduction

Colorectal and anal cancer poses a significant public health issue, with surgery being a crucial treatment for most patients, often combined with chemo- and radiotherapy. Although curative, treatment may result in late complications, including gastrointestinal symptoms¹, the most common of those being diarrhea, bleeding, malabsorption, and secondary to the abovementioned sometimes also fecal incontinence, which can significantly affect quality of life. Specialized clinics integrating gastroenterology to manage these complications represent a promising strategy, offering targeted, multidisciplinary care to enhance patient outcomes. We have established such a specialized clinic and from early on we chose to integrate a gastroenterologist into the routine outpatient care for these patients².

This paper aims to give detailed recommendations for the clinical care of patients with diarrhea, malabsorption, discomfort, pain, bleeding, and incontinence, and discuss the role of the gastroenterologist in these specialized clinics treating patients after curative surgery for colorectal and anal cancer.

Rationale for gastroenterologist integration

Gastroenterologists are important members of the multidisciplinary team in clinics dedicated to the management of late complications in the treatment of colorectal and anal cancer³. Their critical contribution lies in specialized knowledge for diagnosing and managing post-surgery gastrointestinal symptoms. With a profound understanding of the gastrointestinal system's functions and the potential pathophysiological shifts after surgical and oncologic treatment, they are key to diagnosing

and managing complications effectively. Diarrhea, bleeding, malabsorption, and fecal incontinence^{4,5} are symptoms often treated in gastroenterology and most gastroenterologists will have experience in handling these challenges.

In these specialized clinics, gastroenterologists undertake a thorough diagnostic process to pinpoint the causes of symptoms. Often treatment can be initiated based on patient history and symptoms alone. If the symptoms are unclear or if the response to treatment is negative, several diagnostic tools are available including endoscopies, imaging, lab work, and various advanced tools. For example, SeHCAT scanning for bile acid malabsorption⁶⁻⁸—a prevalent issue post-surgery—though not universally available, illustrates one of the specific diagnostic approaches employed. Treatment plans tailored to the individual may include medication, diet adjustments, or possibly further surgical or endoscopic interventions.

Multidisciplinary care models, enriched by gastroenterology, have been validated to significantly improve outcomes for those with complex post-surgical issues³. The integration of gastroenterologists into these clinics is driven by their capacity to manage and treat complex gastrointestinal conditions and symptoms. This approach not only enhances comprehensive symptom management and diagnostic precision but also ensures the creation of personalized treatment strategies essential for the well-being of patients recovering from colorectal cancer surgery⁹.

Examples of relevant interventions

Diarrhea

1. Initial assessment:

- Evaluate the patient's symptoms, take a thorough defecation history, and uncover more mixed stool patterns, for example, more alternating stools, or diarrhea with underlying constipation. If it is a clearly diarrhea, uncover the severity and duration of diarrhea, uncover accompanying symptoms such as the presence of malabsorption, discomfort, unrest, bloating, pain, bleeding, incontinence, and weight loss.
 - Uncover the patient's usual gastrointestinal function before illness.
 - Consider the patient's surgical history, including the type of surgery performed (e.g., right-sided hemicolectomy) and any adjunct treatments such as chemotherapy or radiation.
 - Determine if the patient is taking medication that affects gastrointestinal function, especially opioids.
2. Diagnostic workup:
- Test for specific causes of diarrhea, such as infectious causes, bile acid malabsorption, small intestinal bacterial overgrowth (SIBO), and pancreatic insufficiency.
 - Easy to use is empirical dietary monitoring with corn test for transit time assessment¹⁰ if standard diagnostic tools are unavailable or inconclusive.
3. Treatment strategies:
- For bile acid diarrhea: First line treatment is the bile acid sequestrant cholestyramine, which based on price is the first choice, however, for marginal patients consider going straight to second-line treatment due to cholestyramine's unfavorable profile of side effects
 - The second line treatment is colesevelam or liraglutide. The effect and price of these are comparable but mechanisms of action and profile of side effects differ, so this should be considered when starting treatment. If the treatment of one fails change to the alternative.
 - For SIBO: We prefer to optimize the treatment of other causes for symptoms like bile acid malabsorption, or pancreatic insufficiency before treating SIBO. When choosing to treat SIBO consider antibiotics tailored to bacterial overgrowth and with fewest side effects, and dietary adjustments to reduce fermentable substrates. Even when antibiotics are effective the effect is often temporary and there is a need to repeat or prolong treatment.
 - For pancreatic insufficiency: Initiate enzyme replacement therapy (e.g., pancrelipase) and monitor for dosage adjustment based on symptom relief and nutritional status.
 - Symptomatic treatments: Use anti-diarrheal agents, tailored to the underlying cause to avoid exacerbating other conditions (e.g., opiate-induced constipation).
4. Follow-up and monitoring:
- Regular follow-up to assess treatment response, adjust therapies as needed, and monitor for new or evolving symptoms. When treatment is optimized, there is no need for routine follow-up, and we typically only see patients if the need arises.
 - Consider the involvement of a multidisciplinary team including dietitians

for nutritional support if symptoms cannot be sufficiently alleviated.

Malabsorption

1. Clinical evaluation:

- Malabsorption and weight loss are not common after colorectal surgery, SIBO, or pancreatic insufficiency, but may be seen after chemotherapy. Thoroughly assess the patient's symptoms, including weight loss, steatorrhea, vitamin deficiencies, and other signs indicative of malabsorption.
- Review the surgical history, noting the extent of resection¹¹ and any adjuvant therapies (e.g., chemotherapy, radiation) that could impact gut function.

2. Diagnostic investigations:

- Conduct tests to identify specific deficiencies (e.g., fat-soluble vitamins, vitamin B12, iron) and the extent of malabsorption. This may include fecal fat tests, blood tests for nutrient levels, and imaging or endoscopic evaluations as needed.
- Test for conditions that commonly cause or exacerbate malabsorption post-surgery, such as SIBO or pancreatic insufficiency.

3. Specific treatments based on findings:

- For vitamin and mineral deficiencies: Supplement the specific nutrients found to be deficient. This may involve high-dose vitamin supplements, iron infusions, or other targeted supplementations.
- For SIBO: Administer appropriate antibiotics based on suspected or confirmed bacterial overgrowth, and

consider dietary modifications to reduce symptoms.

- For pancreatic insufficiency: Start pancreatic enzyme replacement therapy, adjusting the dosage based on symptom improvement and nutritional status. Ensure adequate fat-soluble vitamin intake.
- Dietary management: Collaborate with a dietitian for personalized dietary advice, focusing on managing malabsorption while ensuring that nutritional needs are met. This may include recommendations for a low-fat diet, medium-chain triglyceride oil supplementation, and guidance on managing specific nutrient deficiencies.

4. Monitoring and adjustment:

- Schedule regular follow-ups to monitor the patient's response to treatment, nutritional status, and symptom management. Regular follow-up as long as weight is not stable, going forward there is often a need for routine biochemical control. Can be through one's family doctor or in the Late Complication Clinic.
- If malabsorption, examine the patient for osteoporosis with DEXA scan and start preventive treatment with vitamin D and calcium.
- Adjust treatments as necessary based on ongoing assessments and emerging needs.

5. Multidisciplinary approach:

- Engage a multidisciplinary team including gastroenterologists, dietitians, surgeons, and possibly endocrinologists for comprehensive management of complex cases.

- Consider the patient's overall well-being, addressing not only physical symptoms but also the potential psychological impacts of living with malabsorption.

Discomfort and pain

1. Initial evaluation:

- Assess the characteristics of the pain (location, intensity, duration, triggers) and associated symptoms (nausea, vomiting, changes in bowel habits).
- Review surgical history, including the type of surgery performed and any postoperative complications that may contribute to symptoms.

2. Diagnostic assessment:

- Conduct a thorough physical examination and consider diagnostic tests such as abdominal imaging (CT, MRI) to identify any anatomical causes of pain, including adhesions, hernias, or recurrence of disease.
- Evaluate for functional gastrointestinal disorders such as irritable bowel syndrome, which can be exacerbated by surgery.

3. Management strategies:

- For identified anatomical issues: Refer for surgical evaluation or intervention as appropriate.
- For functional disorders:
 - First, try to regulate gastrointestinal function, often with Psyllium or laxatives, and make it clear to the patient that the primary goal of the treatment is relief of symptoms, in this case pain/discomfort.

- Try dietary modifications to address potential triggers (e.g., low FODMAP diet for irritable bowel syndrome).
- Consider pharmacological treatments such as antispasmodics for cramping or low-dose antidepressants/GABA for neuropathic pain.
- Avoid opioid analgesics if at all possible, always use as first line of treatment over-the-counter analgesics and adjuvant therapies such as gabapentin or tricyclic antidepressants.
- If opioids are necessary employ opioid analgesics cautiously and for the shortest duration necessary. Follow-up and monitor.

- Schedule regular follow-ups to assess the effectiveness of interventions and adjust management plans based on symptom evolution and patient feedback.

4. Multidisciplinary support:

- If needed refer to a specialized unit for chronic pain or engage a multidisciplinary team including gastroenterologists, pain management specialists, dietitians, and psychologists if needed to provide comprehensive care addressing both the physical and emotional aspects of post-surgical recovery.

Bleeding

1. Initial assessment:

- Carefully evaluate the patient's history, including the extent and type of surgery performed, any adjuvant therapies (chemotherapy, radiation), and the duration, frequency, and volume of bleeding.

- Determine the presence of associated symptoms such as pain, changes in bowel habits, or signs of anemia (fatigue, pallor).

2. Diagnostic evaluation:

- Conduct a physical examination, including digital rectal examination, to assess for local causes of bleeding such as hemorrhoids, fissures, or anastomotic site issues.
- Utilize endoscopic evaluations (colonoscopy, sigmoidoscopy) to visualize the rectum and colon, identify the source of bleeding, and assess for recurrence of cancer, radiation proctitis, or other pathologies.
- Consider imaging studies (CT, MRI) if indicated, to evaluate for any underlying anatomical abnormalities or disease recurrence.

3. Management plan:

- For hemorrhoids or fissures: Implement conservative treatments including dietary modifications for softer stools and topical treatments (creams, suppositories).
- For anastomotic site bleeding: Minor bleeding often resolves with conservative management; significant issues may require endoscopic interventions (e.g., clipping, cauterization).
- For radiation proctitis:
 - Initiate medical therapies such as topical steroids for mild to moderate cases.
 - sucralfate enemas, oral metronidazole, or oral 5-ASA.

- Consider advanced therapies like argon plasma coagulation for refractory bleeding or pressure chamber treatment.

- For neoplastic recurrence: Refer to surgical oncology for evaluation and management, which may include surgical intervention, chemotherapy, or radiation therapy depending on the recurrence's extent and location.

4. Follow-up and support:

- Arrange for close monitoring of the patient's response to treatment, with adjustments as needed based on symptom improvement or progression.
- Provide support for the patient, including information on expected outcomes and signs of complications that warrant immediate medical attention.
- Address the patient's concerns and questions
 - about the impact of rectal bleeding on quality of life and daily activities, offering reassurance and practical advice for managing symptoms.
- Underline that minor to moderate bleeding is not dangerous and can be acceptable.

5. Multidisciplinary approach:

- Involve a team of specialists as needed, including gastroenterologists, colorectal surgeons, oncologists, and radiologists, to ensure a comprehensive approach to diagnosis and management.
- Consider referral to nutritional services for dietary advice and to support groups

or psychological services for patients needing additional emotional support.

Incontinence

1. Assessment and evaluation:

- Conduct a detailed history to understand the extent of incontinence (frequency, consistency of fecal matter, triggering factors) and its impact on the patient's quality of life.
- Review the surgical history, noting the type of colorectal surgery performed, any complications, and the presence of conditions like diarrhea or rectal urgency that could exacerbate incontinence.

2. Diagnostic workup:

- Perform a physical examination focusing on the anorectal area to assess for muscle tone, reflexes, and any anatomical abnormalities. The digital rectal examination provides a reliable evaluation of rest and effort pressures, and it rules out rectal tumors or stenosis as well as fecal impaction¹².
- Consider endoanal ultrasound to visualize sphincter integrity and identify defects or scarring from surgery.
- Additional tests, such as stool tests for malabsorption or infection, may be indicated based on symptoms⁴.

3. Management strategies:

- Conservative measures:
 - Initiate dietary modifications to manage stool consistency, including soluble fiber supplementation for watery stools or dietary adjustments to reduce irritants⁵.

○ Implement pelvic floor muscle exercises to strengthen the sphincter and improve control.

○ Transanal irrigation is effective but sometimes has poor patient compliance¹². The treatment effect is based on emptying the colon of the maximum amount of fecal matter, and having less bowel content for fecal incontinence during the day.

○ Biofeedback therapy to enhance sphincter and pelvic floor muscle coordination may be beneficial in some patients.

- Medications:

○ Consider antidiarrheal agents (e.g., loperamide) to increase stool consistency and reduce urgency.

○ Use of bulking agents to improve stool form and facilitate control.

- Advanced therapies:

○ If incontinence is due to the urgency to evacuate a few ml of blood if rectal bleeding is present, then treatment will focus on treatment of rectal bleeding (see above).

○ Explore surgical options for patients with significant sphincter damage or those not responding to conservative management, including sphincter repair, or sacral nerve modulation.

○ For severe cases unresponsive to other treatments, discuss the possibility of a stoma to manage incontinence.

4. Follow-up and support:

- Schedule regular follow-up appointments to monitor progress, adjust treatments as

necessary, and address any emerging issues.

- Provide psychological support and counseling to help patients cope with the impact of fecal incontinence on their lifestyle and mental health.
- Offer information on supportive resources, such as incontinence pads and community support groups, to enhance coping strategies.

5. Multidisciplinary approach:

- If necessary, involve a team including gastroenterologists, colorectal surgeons, physiotherapists specializing in pelvic floor therapy, and dietitians to address all aspects of fecal incontinence.

Perspectives and conclusion

Gastroenterologists play an important role in the diagnosis and management of long-term postoperative complications following colorectal cancer surgery. Utilizing an array of diagnostic tools, they accurately ascertain the etiology of patients' symptoms in a manner that is not usually handled by colorectal surgeons. Thus, the above-mentioned recommendations for initial assessment, diagnostic workup, treatment strategies, follow-up, and monitoring of patients with diarrhea, malabsorption, discomfort, pain, bleeding, and incontinence are based on clinical experience and routines in gastroenterology with other patient categories but applied in the surgical outpatient clinic covering patients after surgery for colorectal and anal cancer. The expertise of the gastroenterologist thereby enables the development of tailored therapeutic strategies, encompassing pharmacological interventions, dietary modifications, and

potentially further surgical or endoscopic procedures. These specialists employ advanced diagnostic techniques to identify conditions such as bile acid malabsorption and small intestinal bacterial overgrowth, devising specific treatments that may include bile acid sequestrants, antibiotics, nutritional advice, and additional supportive measures. This approach markedly enhances patients' quality of life by offering continuous care adjustments and extending psychological and social support to address the broader implications of post-surgical complications.

The integration of gastroenterology into specialized clinics for postoperative care in colorectal and anal cancer surgery represents a holistic, patient-centered model, significantly improving quality of life. Emerging research supports the effectiveness of this integrated care framework, recommending its broader adoption to improve patient outcomes following colorectal cancer surgery. This model highlights the critical contribution of gastroenterologists to comprehensive care by focusing on symptoms often overlooked or insufficiently managed in conventional colorectal postoperative care, thus emphasizing the importance of specialized gastroenterological involvement in these clinical settings thereby advocating for closer collaboration between surgeons and gastroenterologists.

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