Functional Complications After Colon and Rectal Surgery

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Key Concepts

- Low anterior resection syndrome (LARS) is extremely common after proctectomy with a multifactorial etiology including damage to sphincters, variations in RAIR, intestinal motility changes, autonomic and somatic nerve injury, and pelvic floor dysfunction.
- Radiation and pelvic sepsis may contribute to deterioration of bowel function.
- Symptoms may include incontinence to stool or flatus, urgency, fragmentation of stool, difficult evacuation, and a sense of incomplete evacuation.
- Alternative reconstructions utilizing colonic pouch or side-to-end anastomosis may be associated with better bowel function when compared to straight anastomoses.
- Pelvic nerve damage during TME can impair urinary and sexual function as well as bowel function.
- Sexual dysfunction occurs in both males and females and may manifest in women as dyspareunia and failure to lubricate with arousal. In men, erectile dysfunction and retrograde ejaculation may occur.
- Colorectal surgeons may underappreciate the magnitude of bowel dysfunction after rectal cancer resection and its impact on quality of life.
- There is no accepted treatment algorithm for bowel dysfunction after proctectomy; symptom control utilizing medications to slow and bulk stools, protection of the perianal skin, physical therapy, colonic irrigation, and in some cases sacral nerve stimulation are currently recognized therapies.

Introduction

- Bowel dysfunction after colorectal (CRA) or coloanal (CAA) anastomosis is extremely common and underappreciated.
- This dysfunction is termed low anterior resection syndrome (LARS).

Low Anterior Resection Syndrome

Symptoms and Prevalence

- The theory that quality of life is better without a permanent stoma after low rectal resection and CRA or CAA has not been borne out in the literature.

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- QOL may be equivalent between those who had an abdominal perineal resection and those with sphincter preservation (low anterior resection [LAR]).
- 50–90% of patients after LAR experience some level of bowel dysfunction postoperatively.
- LARS symptoms include fecal incontinence, urgency, frequent small bowel movements, and clustering of stools. It may also be associated with tenesmus, rectal/anal pain, difficult defecation, impotence, dyspareunia, or debilitating anal skin irritation.
- Diarrhea has the strongest correlation with decreased QOL.
- A definition of LARS is disordered and dysfunctional bowel patterns after rectal resection leading to a detriment in quality of life.
- LARS symptoms may be lifelong with 42% having major LARS symptoms and 22% minor LARS symptoms at 14 years after surgery in one study.

Etiology of LARS

- The exact etiology of LARS is unclear but appears to be multifactorial.
- Reduced rectal reservoir, impaired rectal compliance, abnormal GI motility, partially denervated colon, loss of rectoanal coordination, and impairment of sympathetic and parasympathetic nerve supply have all been implicated in the literature.

Risk Factors for LARS

- Fecal incontinence associated with LARS is multifactorial and has been associated with short anastomotic distance to the anal verge, male gender, younger age, or any form of pelvic sepsis.
- Radiotherapy is a risk factor for LARS.

Evaluation and Bowel Dysfunction After LAR

- The LARS score is calculated from a validated instrument evaluating bowel function after sphincter-preserving rectal cancer surgery (Fig. 56.1).
- A composite score of 0–20 suggests no LARS, while 21–29 is minor LARS, and 30–42 is consistent with major LARS.

Treatment for Bowel Dysfunction After LAR

- There is no specific agreed treatment algorithm for LARS. The current therapy targets distressing symptoms.
- Loperamide, codeine, pelvic floor physiotherapy, biofeedback, and rectal irrigation have been reported to improve symptoms of fecal incontinence and bowel frequency.

Retrograde Colonic Irrigation

- Rectal irrigation of high-volume tepid water is a treatment option for fecal incontinence and fragmentation.
- The side effects are mild and the procedure is inexpensive.

Sacral Nerve Stimulation (SNS)

- SNS improves function by decreasing antegrade colonic motor activity and increasing retrograde activity. The success rate has been reported to be 74%.
- Changes in symptoms include decreased or improved fecal incontinence, nocturnal defecation, fragmentation, urgency, time to defer defecation, and soiling.

The aim of this questionnaire is to assess your bowel function.
Please tick only one box for each question. It may be difficult to select only one answer, as we know that for some patients symptoms vary from day to day.
We would kindly ask you to choose one answer which best describes your daily life. If you have recently had an infection affecting your bowel function, please do not take this into account and focus on answering questions to reflect your usual daily bowel function.

Do you ever have occasions when you cannot control your flatus (wind)?
☐ No, never
☐ Yes, less than once per week
☐ Yes, at least once per week

Do you ever have any accidental leakage of liqiud stool?
☐ No, never
☐ Yes, less than once per week
☐ Yes, at least once per week

How often do you open your bowels?
☐ More than 7 times per day (24 hours)
☐ 4-7 times per day (24 hours)
☐ 1-3 times per day (24 hours)
☐ Less than once per day (24 hours)

Do you ever have to open your bowel again within one hour of the last bowel opening?
☐ No, never
☐ Yes, less than once per week
☐ Yes, at least once per week

Do you ever have such a strong urge to open your bowels that you have to rush to the toilet?
☐ No, never
☐ Yes, less than once per week
☐ Yes, at least once per week

Fig. 56.1 LARS score questionnaire. (Adapted from Emmertsen K, Laurberg S. Low anterior resection syndrome score: development and validation of a symptom-based scoring system for bowel dysfunction after low anterior resection for rectal cancer. Ann Surg 2012;255(5):922–8)

Colorectal Reconstruction and Effects on Function After Colorectal Surgery

- It was speculated that the traditional straight anastomosis led to reduced reservoir volume and contributed to the functional LARS issues. In an effort to improve bowel function, surgeons developed alternative anastomosis with neoreservoirs.

Colonic J Pouch

- The colonic J pouch should be 4–6 cm to reduce problems with incomplete or difficult evacuation (vs the size of the ileal J pouch which is 18–20 cm).
- After having a colonic J pouch, patients in the long term report reduced daily stool frequency, decreased fecal urge incontinence, and less incomplete evacuation, and they used less antidiarrheal medication.

Transverse Coloplasty

- Transverse coloplasty does not confer any functional advantage over a straight anastomosis, and there is minimal indication to reconstruct with this technique.

Side-to-End Anastomosis

- For the side-to-end anastomosis, the anastomosis is created 3–6 cm upstream from the cut edge of the proximal colon (on the antimesenteric side). The open end of the proximal colon is then closed.

- The side-to-end anastomosis seems to have the same functional outcome and benefits as the colonic J pouch.
- Anastomotic leak rates are similar with side-to-end and colonic J pouch reconstructions, but both seem to have a lower rate compared to the straight anastomosis.
- Utilizing a 3–6 cm blind limb seems to reduce evacuation problems.

Sexual and Urologic Dysfunction After Surgery for Rectal Cancer

Nerves of the Pelvis

- The main etiology of sexual and urinary dysfunction after proctectomy is mainly related to direct nerve injury.
- Nerve damage during ligation of the inferior mesenteric artery and dissection in the retrorectal space can damage the superior hypogastric plexus particularly at the sacral promontory and result in retrograde ejaculation.
- Anterolateral pelvic dissection and division of the lateral ligament can damage the pelvic plexus and result in erectile dysfunction.
- Anterior dissection especially on the prostate side of Denonvilliers' fascia can damage the nervi erigentes or cavernous nerves and lead to erectile dysfunction.

Sexual Dysfunction After Surgery for Rectal Cancer

- In men sexual dysfunction after rectal cancer surgery consists usually of erectile dysfunction (ED) and retrograde ejaculation.
- There also can be difficulty with orgasm, libido, and reduced body image.
- Postoperatively in women, sexual dysfunction includes problems with vaginal lubrication, dyspareunia, arousal, and orgasm.
- Other risk factors for postoperative sexual dysfunction include increased operative blood loss, preoperative radiation, anastomotic leak, and presence of a stoma.
- Validated tools to evaluate sexual dysfunction after rectal cancer surgery are the International Index of Erectile Dysfunction (IIEF), the Female Sexual Function Index (FISI), and the EORTC QLQ-30 and EORTC QLQ-CR38 to measure QOL in colorectal cancer patients.
- Treatment of postoperative retrograde ejaculation includes tricyclic antidepressants, antihistamines (chlorpheniramine), and decongestants like ephedrine sulfate and phenylephrine (these help close the bladder neck during ejaculation).
- ED is treated with a trial of sildenafil citrate, tadalafil, or vardenafil. At low dose these medications increase blood flow to the area around the nerves to promote healing.
- For women, medications and creams aimed at improving vaginal lubrication along with pelvic floor physical therapy are the main treatments. Sexual dysfunction in women after rectal cancer surgery has not been extensively studied.

Urologic Dysfunction

- Thirty to seventy percent of patients have bladder dysfunction after pelvic surgery, but this is usually temporary with only 10% requiring medical or surgical treatment.
- Any voiding problem that persists after 3 months may be permanent.

Perianal Skin Irritation After Colorectal Surgery

- Perianal skin irritation is common after rectal cancer surgery due to loose frequent stools and improper wiping techniques.
- Chemoradiation can reduce skin pliability—adding to skin irritation.
- Barrier creams (Desitin™ or Balmex®) applied like frosting to coat the anal area are the first line of therapy to protect the skin. After defe-

cation the goal is to wipe against the cream and avoid wiping it totally off.
- If there is a fungal component adding to the irritation, antifungal powders or creams can be used.
- For severe itching or pain, a short course of steroid cream can provide dramatic relief (but only a short course as it can thin the skin).
- Using wet toilet paper and avoiding the urge to over-wipe are an important advice.
- Management of stool frequency and consistency with fiber to bulk stools and antidiarrheal medication can improve problems with perianal skin irritation.
- Antidiarrheal mediation includes diphenoxylate hydrochloride/atropine and loperamide. Up to eight pills daily of each may be taken, but usually this maximal dose is not required for optimization of stool frequency. This medication should be taken *before* meals.