

Review

Clinical Manifestation and Treatment of Low Anterior Resection Syndrome

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Abstract

Globally, colorectal cancer is one of the most prevalent cancers and following sphincter-preserving procedures for rectal cancer, many patients experience various forms of bowel dysfunction. Low anterior resection syndrome (LARS), which has a detrimental effect on the patients' quality of life, is the most common form in which bowel dysfunction presents and is a frequently reported complication of rectal cancer surgeries. Assessment of LARS severity requires a thorough history taking, physical examination of the patients, use of validated questionnaires, and other diagnostic techniques. The clinical manifestations of LARS can be categorized into two groups. The first includes increased frequency, incontinence, and fecal urgency. The second category includes issues with bowel emptying, incomplete eversion sensations, and constipation. Some patients describe traits from both categories, either switching back and forth between the two patterns or experiencing both at once. Each patient's LARS treatment should be tailored as per need. Patients with major LARS typically require multimodal therapy to achieve acceptable results. Treatment options include minimally invasive techniques as well as conservative care such as pharmacological management, pelvic floor rehabilitation, and transanal irrigation. Fecal diversion might be required if this treatment is unsuccessful. Appropriate Kegel exercise of the anal sphincter and initial precise dissection with preservation of nerves and development of a neorectal reservoir after anastomosis can limit the occurrence of LARS. For patients who have LARS risk factors, pre-treatment counselling is a crucial step. The purpose of this research is to review the available information about clinical manifestation and treatment of LARS.

Keywords: LARS, cancer, treatment, patient

Introduction

Colorectal cancer is one of the most prevalent cancers in the world globally with between one and two million new cases being diagnosed each year. It is the third most pervasive cancer and the fourth most widespread cause of cancer-related death, with 700,000 deaths each year, only being surpassed by lung, liver, and stomach cancers (1). The survival rate after rectal or distal sigmoid cancer surgery has increased owing to improvements in surgical methods as well as the best local, regional, and systemic therapeutic choices. These survivors deal with the effects of their illness and medical care. As a result, quality of life and long-term outcomes following cancer therapy are receiving more attention from medical professionals. The best method for treating non-disseminated rectal or distal sigmoid cancer is now low anterior resection with entire mesorectal excision. However, after this treatment, it's common to experience symptoms including faecal incontinence, urgency, and frequent bowel movements. LARS, which includes the aforementioned symptoms, affects quality of life severely in 70%–90% of patients (2).

Oncological radicality, postoperative complications, recurrence rate, and survival are the most crucial quality indicators in rectal cancer surgery. Up to 25%–50% of patients who undergo low anterior resection experience rectal dysfunction. But despite how frequently it occurs, not enough attention is paid to it. Following surgery, recurrent recti dysfunction leads to a series of signs and symptoms depicted as LARS (3). LARS is a term that is not precisely interpretable, but it refers to any altered defecation status that follows an anal sphincter-preservation procedure for rectal cancer (4). After sphincter-preserving surgery, a wide range of symptoms, such as trouble emptying bowel, fecal urgency, and fecal incontinence collectively characterize LARS. Despite multiple studies assessing functional outcomes following LARS, there is no widely accepted definition of LARS. Impaired bowel function following rectal resection that lowers the quality of life is a reasonable criterion that can be used in clinical settings (5).

To estimate the postoperative risk of LARS, a clinically appropriate pre-operative nomogram has been created. This tool may be useful for patient counselling prior to surgery. Since postoperative bowel dysfunction frequently remains undetected, the management of LARS starts with identifying patients who exhibit symptoms. The most effective way to accomplish this goal is to screen patients systematically using validated

patient-reported outcome measures. When a patient is diagnosed with LARS, conservative care techniques should be used. Involving patients and educating them about LARS self-care can be facilitated greatly by the presence of a LARS multidisciplinary team. Second-line therapies, such as transanal irrigation or pelvic floor therapy, might be started if LARS symptoms continue or get worse over time despite conservative measures. For recalcitrant, severe LARS symptoms, a small percentage of patients will eventually need an intervention such as sacral neuromodulation or a permanent colostomy (6). Although it is known that several factors are linked to a higher onset of LARS, in clinical practice, technical challenges and oncological restrictions frequently make it difficult to use some preventative strategies. Preventive measures that, if not completely remove the symptoms, at least lessen them include transtomal irrigations, intraoperative neuromonitoring, pelvic floor rehabilitation prior to stoma closure, and early transanal irrigation (7). The purpose of this research is to review the available information about clinical manifestation and treatment of LARS.

Methodology

This study is based on a comprehensive literature search conducted on December 5, 2022, in the Medline and Cochrane databases, utilizing the medical topic headings (MeSH) and a combination of all available related terms, according to the database. To prevent missing any possible research, a manual search for publications was conducted through Google Scholar, using the reference lists of the previously listed papers as a starting point. We looked for valuable information in papers that discussed the information about clinical manifestation and treatment of LARS. There were no restrictions on date, language, participant age, or type of publication.

Discussion

LARS, which includes the constellation of symptoms of fecal urgency, frequent bowel movements, bowel fragmentation, and incontinence, affects between 25%–80% of patients who have a low or very low anterior resection. The risk for sphincter injury during anastomosis construction, changes to anorectal physiology, the onset of pudendal neuropathy, and lumbar plexopathy, as well as the use of adjuvant and neoadjuvant medicines, are all factors in the complex etiology of LARS. By creating a neorectal reservoir, which can be a colonic J-pouch, a transverse colectomy, or a side-to-end anastomosis may lead to alleviation of symptoms of the LARS (8). Over the past few years,

functional bowel problems following rectal cancer surgery and postoperative complaints following colorectal cancer surgery have received a great deal of attention. LARS, a collection of painful abdominal complaints following colon cancer therapy, has been identified and has a prevalence of up to 60%–90%. An earlier study showed that serious LARS symptoms affect patients' quality of life significantly and are experienced by more than 20% of those who get treatment for tumours above the rectum. Additionally, a recent study revealed that 29% of patients with early-stage rectal tumours underwent substantial LARS 5 years following transanal endoscopic microsurgical excision (9).

Clinical manifestations

Fecal incontinence, urgency, and incomplete evacuation are marked symptoms. Short-term symptoms, which disappear 6 to 12 months after anal sphincter sparing surgery, are typically brought on by transient neorectal irritation. Long-term LARS symptoms that persist for more than a year following surgery are more likely the result of permanent modifications. Approximately 46%–49% of patients who have anal sphincter-sparing surgery still have LARS symptoms after 11.1–14.6 years of follow-up. The clinical manifestations of LARS can be categorized into two groups. The first includes increased frequency, incontinence, and fecal urgency. The second category includes issues with bowel emptying, incomplete evicton sensations, and constipation. Some patients describe traits from both categories, either switching back and forth between the two patterns or going through both at once (4). Urgency, clustering, difficult or partial evacuation, flatus or fecal incontinence are typical signs of bowel dysfunction after surgery. It has been noted that more than 40% of patients develop toilet dependence, which can seriously harm a patient's ability to function physically, socially, occupationally, and psychologically and considerably lower their quality of life. Even after long-term follow-up, the symptoms of intestinal dysfunction that develop after surgery for rectal cancer can last (10).

Qin et al. demonstrated in their findings that 71.1% of patients had bowel dysfunction, with 44.4% reporting severe impairment. Urgency and clustering symptoms were discovered to be severe disruptions. Preoperative long-course radiation ($p < 0.001$) and a tumour in the bottom third ($p = 0.002$) were both independently linked to significant bowel dysfunction, as per the regression analysis. Patients who had received radiation treatment and had a lower-third tumour ($p < 0.001$) or thickening of the rectal wall ($p < 0.001$) were much more likely to

experience severe dysfunction (11). Similarly, Emmertson and Laurberg reported in their findings that incontinence for flatus, incontinence for liquid stools, frequency, clustering, and urgency were the top 5 concerns. There were three categories within the range (0–42): 0 to 20 (no LARS), 21 to 29 (minimal LARS), and 30 to 42. (major LARS). The results demonstrated strong correlation, high specificity (82.52%), and high sensitivity (72.54%) for significant LARS. Significant differences between the groups with and without radiation ($P < 0.0001$), tumor height greater than or less than 5 cm ($P < 0.0001$), and whole vs partial mesorectal excision ($P = 0.0163$) were shown by discriminant validity (12).

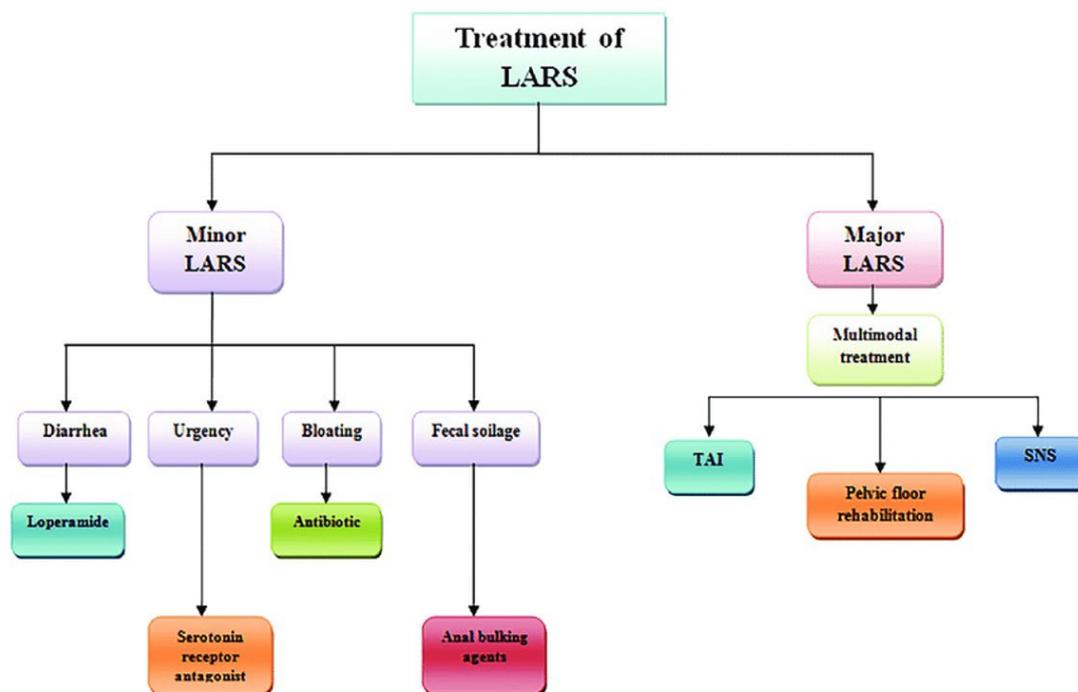
Management

Anti-diarrheal medications such as loperamide, which have been tested in randomized trials in individuals with irritable bowel syndrome, can be used to treat patients with minimal LARS who only have diarrhea. Loperamide lessens the frequency of bowel movements and improves the consistency of the stool in irritable bowel syndrome patients. Additionally, in patients who have a restorative proctocolectomy with ileoanal pouch, loperamide dramatically reduces stool frequency, alters several characteristics of pouch contraction, and enhances anal sphincter function (13, 14). For the purpose of managing fecal incontinence, it is advised that stool softening agents such as caffeine, citrus foods, spicy foods, and alcohol should be avoided by patients. Instead, they should consume dietary fiber, like methylcellulose. Despite the fact that dietary management for fecal incontinence is highly advised, there is little evidence to support the efficacy of dietary strategies in the treatment of LARS. The majority of drugs used for LARS are those that stop excessive intestinal motility. Loperamide and atropine, two antidiarrheal medications, decrease intestinal motility while potentially raising internal anal sphincter tone. Ramosetron, a 5-HT₃ antagonist, is said to be effective in lowering urge, fecal incontinence and toilet visits in male LARS patients. Patients with LARS who experience significant neorectal contractions postprandially are advised to use a 5-HT₃ antagonist (15).

Fecal incontinence is commonly treated with pelvic floor rehabilitation, which includes pelvic floor muscle training, biofeedback training, and rectal balloon training. By enhancing the structural support, timing, and strength of automatic contractions, pelvic floor muscle training minimize leakage. Biofeedback is a technique

that use electronic equipment to transmit visual and auditory signals to the user in order to alert them to certain internal physiological events occurring in the patient. The threshold for recognizing a rectal feeling of distension and synchronizing a voluntary contraction of the external anal sphincter in response to it is lowered by this therapy. Given that biofeedback is usually advised for fecal incontinence patients who do not respond to medicinal therapy and given that fecal incontinence is the primary symptom of LARS, it may be beneficial for treating people with this condition. In order to identify smaller rectal volumes, or to resist urgency by applying progressive distension, or to utilize a voluntary anal squeeze to oppose the recto-anal inhibitory reflex in response to rectal fullness, rectal balloon training is used

to improve rectal sensitivity (16). Similarly, Sakr et al. described that biofeedback, pelvic floor muscle training, electrostimulation, and rectal balloon training are all components of pelvic floor rehabilitation. It has been demonstrated that combining many strategies greatly improves results over using only one. In response to rectal distension, biofeedback therapy increases the sensation of rectal distension and synchronous voluntary external anal sphincter contraction. Authors further suggested that despite the varied and poor quality of the research that are currently available, biofeedback and pelvic floor therapy are helpful in the treatment of LARS (17). Treatment algorithm for LARS is illustrated in (Figure 1).



*TAI: transanal irrigation

** SNS: sacral nerve stimulation

Figure 1: Treatment algorithm for LARS (17)

Transanal irrigation appears to be a successful LARS treatment that significantly enhances quality of life and continence. Since the treatment benefit is comparable to that seen in individuals with LARS diagnosed 6 months or longer after surgery, patients may be evaluated and treated for LARS as soon as possible following surgery. Transanal irrigation appears to have a promising role in the rehabilitation of LARS (18). Likewise, Rosen et al. demonstrated in their findings that transanal has been proven to be a successful and affordable treatment for LARS' crippling effects. Within one month of ileostomy closure, patients who followed a 1000 ml of irrigation

every 24 hours had significantly fewer bowel movements and trips to the bathroom both during the day and at night. They also had better LARS and Wexner scores, which persisted until three months of follow-up. After a month, nighttime defecation episodes and bathroom visits were nearly non-existent (19). Results of a national survey showed that 9 out of 10 respondents suggested lifestyle changes as the main form of treatment for LARS, frequently in conjunction with pharmacological therapy, 82% of surgeons also employed pelvic floor therapy. Additionally, 43% of clinicians use trans-anal irrigation, and 5% use sacral nerve stimulation.

However, 95% of surgeons and colorectal care nurses, believed sacral nerve stimulation to be unsuccessful. There is a significant lack of consistency in the treatment modalities used and how they are combined (20).

The foundation of current and future treatments for LARS includes conservative therapy such as pelvic floor rehabilitation, colonic irrigation, and minimally invasive techniques like sacral nerve stimulation. It is clear that the ideal management strategy for these patients may involve a multimodal strategy rather than a single therapy. It is clear that the ideal management strategy for these patients may involve a multimodal strategy rather than a single drug. Additionally, sacral nerve stimulation has been demonstrated to alter postprandial alterations in rectal motility by decreasing anterograde colonic motor activity and increasing retrograde activity. If it is true that functional changes tend to become permanent after roughly 2 years, as stated by the research, a definite stoma might be suggested to a restricted group of individuals with unreversible functional changes and poor quality of life (21). Unfortunately, despite the increased attention, management of LARS is frequently symptom-based and empirical, relying on treatments for faecal incontinence, faecal urgency, and rectal evacuatory abnormalities. There is very little data to define the management of such a complicated entity. There are no or few high-quality trials carried out. However, there is an urgent need to offer a therapeutic pathway for clinicians who treat patients with LARS given the rising rates of sphincter-preserving rectal surgery as a result of the scientific and technological advancements in the treatment of rectal disorders (22). Despite being a prevalent condition, literature for the treatment of LARS is quite limited especially lacking randomized trials hence there is a strong need of further research for elaborately studying and defining the management strategies also including clinical trials and population-based cohort studies to develop more effective and evidence-based therapeutic strategies for LARS.

Conclusion

LARS possibly results from the interaction of mechanical and neurological pathways. There are scoring methods available to help evaluate patient symptoms and direct therapy since clinically, patients exhibit varied degrees of severity. From conventional therapy to biofeedback and sacral nerve stimulation, there are many different treatment modalities. Future randomized controlled studies focusing on patient risk

classification and creating severity-based therapy algorithms are necessary.

Disclosure

Conflict of interest

There is no conflict of interest

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Data availability

Data that support the findings of this study are embedded within the manuscript.

Author contribution

All authors contributed to conceptualizing, data drafting, collection and final writing of the manuscript.

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