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Ventral rectopexy for rectal procidentia

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A B S T R A C T

The main objective of this section is a detailed review of the new approach to rectal procidentia: minimally invasive nerve-sparing ventral rectopexy, laparoscopic ventral rectopexy (LVR), robotic ventral rectopexy (RVR), and its contextual relevance in the surgical treatment of rectal and pelvic organ prolapse. A brief review of rectal prolapse is offered outlining the main perineal and abdominal surgical approaches to its treatment. Further details regarding LVR and its effectiveness in treatment of pelvic organ prolapse, fecal incontinence, and constipation will be reviewed as it applies to external rectal prolapse (ERP) and internal rectal prolapse (IRP). Details regarding the implications of the type of mesh used and complication profile will be covered.

Introduction

Ventral rectopexy is a surgical procedure used to treat full-thickness rectal prolapse. This procedure has gained popularity in Europe as it has low recurrence rates, and it appears to improve fecal incontinence and constipation.[1,2] The Orr-Loygue procedure was the initial method of ventral approach to rectopexy.[3] This procedure involved the full mobilization of the rectum with suturing of mesh to the anterolateral rectal wall. D'Hoore introduced a laparoscopic nerve-sparing technique for the treatment of rectal prolapse avoiding posterior mobilization of the rectum. This method restricted rectopexy to the anterior wall of the rectum with fixation of mesh at the sacral promontory.[1] In turn, the lack of mobilization of the rectum has been associated with improvement in constipation, a major postoperative problem after classic abdominal rectopexy procedures.[1,4–6]

External rectal prolapse (ERP) and internal rectal prolapse (IRP)

Complete rectal prolapse, also known as external rectal prolapse (ERP), is an intussusception of the rectum extending beyond the anal verge (Fig. 1). Rectal intussusception (RI), also known as internal rectal prolapse (IRP), is telescoping that does not protrude beyond the anal verge (Fig. 2).[1]

Rectal procidentia is often associated with a long history of prolonged straining and constipation, leading to progressive anal sphincter damage and worsening fecal incontinence.[1,9] There is a common association with other types of dysfunction and pelvic organ prolapse, such as urinary incontinence and cystocele. The incidence of enterocele associated with rectal prolapse is reported as high as 42%.[10] The ideal purpose of surgical treatment of rectal procidentia is to correct the prolapse, alleviate bowel dysfunction, and avoid functional sequelae, such as incontinence and constipation.

Surgical treatment of rectal prolapse: Perineal and abdominal approaches

Over 100 operations have been described for the operative treatment of rectal prolapse. Two general approaches center on abdominal operations and perineal procedures. Patient pathology and condition are important considerations for the type of procedure chosen.

Perineal approaches, such as perineal rectosigmoidectomy (Altemeier) and mucosal sleeve resection (Delorme), are reserved for high-surgical-risk patients. They are slightly less effective in controlling prolapse compared to abdominal procedures[11] with recurrence rates ranging from 0% to 28%.[1,12] Overall, perineal approaches improve continence, with better control achieved with concomitant levatorplasty as with an Altemeier procedure.[1,4,13–15] These options continue to be optimal procedures especially for high-surgical-risk, elderly patients secondary to feasibility under regional or local anesthesia.

Abdominal approaches include suture rectopexy, simple suture fixation of rectosigmoidal fold to the presacral fascia, and resection rectopexy, involving sigmoid colectomy with rectopexy (Frykman–Goldberg operation). These abdominal approaches correct the prolapse effectively with an acceptable recurrence rate, of 0–9%. in the majority of the literature, but a recent randomized controlled trial reported a 26% recurrence after abdominal surgery

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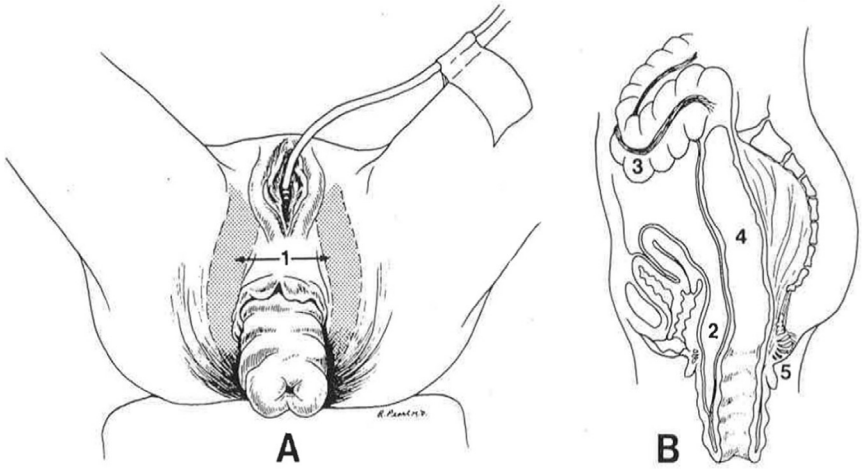

Fig. 1. Anatomic features of external rectal prolapse (ERP). (1) Diastasis of levator ani muscles, (2) deep pouch of Douglas, (3) redundant sigmoid colon, (4) straightening of the rectum, and (5) patulous anus. (Reprinted with permission from Prasad et al.[7])

and, in this trial, there was no difference between abdominal and perineal approaches[1,4,12,16] However, the postoperative incidence of constipation, both new onset and worsening, approach nearly 50% with suture rectopexy.[4] Redundancy of the sigmoid attributing to kinking along with a degree of autonomic denervation with rectal mobilization have been proposed as causes of constipation.[4,6] Resection rectopexy (Frykman–Goldberg operation) provided an option to alleviate this (Fig. 3). Additionally, mesh rectopexy in abdominal approach has been used with placement of mesh below the sacral promontory at the presacral fascia posteriorly anchoring the rectum and resolving the prolapse (Figs. 4 and 5) (Ripstein procedure/Ivalon sponge, posterior mesh rectopexy). The aforementioned procedures involve complete or partial mobilization of the rectum exposing the increased risk of sexual dysfunction at 1–2%[1] and life-threatening presacral bleeding.[4]

Ventral approach and laparoscopic ventral rectopexy (VR and LVR)

The ventral approach to rectopexy was initially described as the Orr-Loygue procedure, involving the full anterior/posterior mobilization of the rectum with attachment of mesh to the anterolateral rectal wall.[2,3] D'Hoore and Penninckx[5] introduced a minimally invasive (laparoscopic) nerve-sparing technique avoiding mobilization of the rectum, and attaching the mesh on the anterior rectal wall while anchoring it to the sacral promontory.[1]

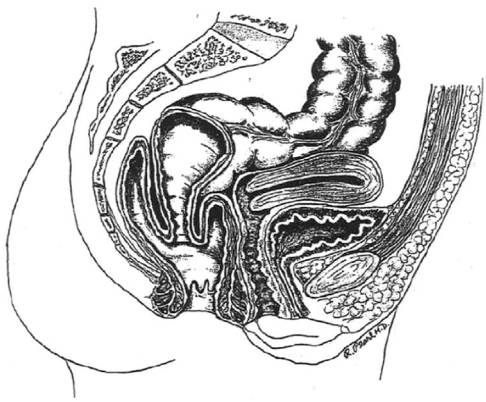

Fig. 2. Sagittal view of internal rectal prolapse (IRP). Telescoping of the rectum that does not protrude through the anal canal. Also known as rectal intussusception (RI). (Illustrations courtesy of Pearl.[8])

Laparoscopic approach was chosen secondary to decreased postoperative pain, faster recovery with shorter hospital stay compared to an open rectopexy approach.[18]

The technique of laparoscopic ventral rectopexy (LVR) involves limited dissection to the superficial right pararectal peritoneal window and minimal anterior rectal dissection between the extraperitoneal rectum and the vagina creating an anterior pocket between the pouch of Douglas and the pelvic floor (Fig. 6A). Mesh is introduced and sutured to the ventral aspect of the distal rectum, with further fixation of mesh to the lateral seromuscular border of the rectum (Fig. 6B). The mesh is then fixed to the sacral promontory and at this point the prolapse reduced. Closure of the rectovaginal septum and suspension of the middle pelvic compartment is achieved with the tacking of the posterior vaginal fornix to the same piece of mesh (Fig. 6C). The mesh is completely covered with peritoneum as the incised portion is sutured over the colpopexy and neo-pouch of Douglas is created. In addition, this prevents the mesh from contact with the small bowel (Fig. 6D).[4–6]

Ventral rectopexy in the management of external rectal prolapse

Recurrence rates after ventral rectopexy range from 0% to 15% in follow-up of 3 months to 7 years.[3] D'Hoore and Penninckx[5] reported a 5% 5-year recurrence rate. The accepted average recurrence rate of 6% in the majority of ventral rectopexy studies is comparable to the posterior rectopexy literature. However, the average follow-up for ventral rectopexy recurrence is limited to 3 years. Long-term data is pending.[1,5,6] An improvement of continence after ventral rectopexy is seen in a majority (80–90%) of patients.[3,6]

Low recurrence rates and improved continence are also frequently seen after posterior rectopexy. However, ventral rectopexy differs from posterior rectopexy with respect to postoperative constipation. Patients undergoing LVR experience improvement and/or resolution of their symptoms in up to 80% of cases.[1,6] This is significantly different from classic posterior rectopexy, with reported constipation rates approaching 50% postoperatively (either new onset or persisting).[1,4–6]

As mentioned previously, abdominal approaches, whether suture or resection rectopexy, with or without mesh, involve the posterolateral dissection of the rectum. This is thought to invariably interrupt autonomic innervation to the rectum resulting in slow transit.[1,4,6] Resection rectopexy has shown improvement in postoperative constipation, highlighting the mechanical cause of a redundant sigmoid kinking and the neuropathic hindgut