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Rectal Prolapse Surgery: What To Do, How To Do

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What is already known on this topic?

- *Complete rectal prolapse requires surgical intervention. Various surgical techniques exist, such as abdominal and perineal approaches. Abdominal procedures tend to have lower recurrence rates but longer recovery, whereas perineal approaches have higher recurrence rates but lower morbidity. The ideal surgical technique remains controversial throughout the literature.*

What does this study add on this topic?

- *This study provides a structured summary of the most commonly used surgical techniques for rectal prolapse, comparing their advantages, disadvantages, and outcomes. It highlights the importance of tailoring surgical choices based on patient factors such as age, comorbidities, and surgical risk, offering a practical guide for clinical decision-making and procedures.*

Abstract

Complete rectal prolapse is a full-thickness protrusion of the rectal wall through the anus. Surgery is indicated for third-degree prolapse, with a variety of surgical techniques available. This review aims to summarize the most commonly used surgical procedures for rectal prolapse and evaluate their advantages and disadvantages. A narrative review of the literature was conducted, focusing on various surgical techniques such as rectopexy, sigmoid resection, and perineal approaches. Data on surgical outcomes, recurrence rates, and complications were extracted and compared. Different surgical techniques show variable success rates. Abdominal procedures such as rectopexy generally have lower recurrence rates but may be associated with longer recovery times. Perineal approaches offer lower morbidity but higher recurrence. The choice of procedure should be individualized, considering patient factors such as age, comorbidities, and surgical risk. Abdominal approaches are favored in younger, fit patients, while perineal procedures may be appropriate for elderly or high-risk individuals.

Keywords: Rectal prolapsus surgery, rectopexy, sigmoid resection

Introduction

The advice given by Hippocrates to treat the difficult cases of rectal prolapse was that if the prolapse could not be reduced, the patient, hanging by his heels, should be shaken for, so that the gut, by shaking, would return to its place.[1] The reports on the results of treatment of rectal prolapse are controversial. There are nearly 51 procedures suggested for the treatment of complete rectal prolapse.[2]

The exact etiology of rectal prolapse is obscure. There are many anatomical alterations such as diastasis of the levator ani muscles, an abnormally deep Douglas pouch, a long sigmoid colon, and loss of rectal fixation to the sacrum. However, which is the cause and which is secondary is still speculated.

The aim of rectal prolapse surgery is to control or remove the prolapse, restore continence and prevent constipation from impaired evacuation with minimal morbidity and mortality. The operations include fixing the rectum (rectopexy), resecting the long bowel, mobilizing and fixing the rectum while resecting the elongated bowel, and resecting the long bowel and to narrow the defect in the levator ani.

Operative Findings

Long anterior peritoneal pouch extending over the rectum to the level of the pelvic floor and anorectal junction between the vagina (or prostate) anteriorly and the rectum posteriorly. This finding is more common in females. So there is a peritoneal sac extending distally between the vagina and rectum. The rectum is mobile, the mesorectum is attenuated. Lateral ligaments are almost completely deficient. The retrorectal space is very wide. The sigmoid colon is usually mobile and long. So, surgery aims to correct these morphological findings.[3-5]

Surgical Procedures For Rectal Prolapse

There are many surgical procedures for the treatment of complete rectal prolapse, but the results are controversial. These procedures are performed by perineal or abdominal approaches[2,6-8] (Table 1).

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Perineal Repairs

It can be performed using local anesthesia and intravenous sedation.

Anal Encircling Procedures

Thiersch Procedure

It is described by Thiersch in 1891. He used a silver wire. General, epidural, or local anesthesia can be used. The patient is in the lithotomy or prone jackknife position. If local anesthesia is used, the perianal region is infiltrated with 0.5% lidocaine with 1:200000 epinephrine. A small incision is made in front and behind the anus, or a short radial incision about 1 cm long is made approximately 2 cm from the anal verge. The left posterolateral and right anterolateral aspects can be used so that the ends of the material can be buried in the subcutaneous fat tissue. Each incision is deepened to 2.5-3 cm. A curved forceps or a curved Doyen needle is used to make a subcutaneous tunnel lateral to the anal canal. It is introduced through the anterior incision and brought out through the posterior incision. It must pass outside the external sphincter and above the anococcygeal ligament. A Thiersch wire is grasped with the forceps in the posterior incision and delivered around one half of the anal canal to the front**.** The same procedure is done on the other side of the anal canal. The posterior vaginal wall or the rectal mucosa should not be penetrated. With a finger in the anal canal, the wire is tied. The knot is buried in the ischioanal fossa by approximating the fat with interrupted 3/0 Vicryl sutures, and the skin incisions are closed. The wire ring acts as an obstruction and prevents the prolapse from passing through the anus. Materials such as no. 2 Prolene, silastic rubber, stainless steel wire, synthetic mesh, and recently the Angelchik anti-reflux prosthesis and gracilis muscle can be used. Nylon is inelastic and creates a rigid band around the anal canal. Creating correct tension with silicon rubber is difficult.

Pros and Cons

It has fallen out of practice. It may be reserved for very ill patients with severe comorbidities who cannot undergo abdominal operations. It can be performed with local anesthesia and intravenous sedation. The mortality is almost none. It may be repeated or alternated with another procedure. Major operation is avoided. High failure and complication rate. The Tiersch wire has a 20%-60% recurrence rate, with complications such as breakage, infection, and erosion. The wire or nylon may cut into the anal canal and may fracture. Fecal impaction often develops if the wire is tied too tightly. If the wire is tied loosely, the control of the prolapse is inadequate. There is no support for the anal canal, and the wire acts as an obstruction to the prolapsing rectum.

Mesh Encirclement of the Anorectal Junction

Marlex or Prolene mesh is used. It is placed around the anus at the anorectal junction level outside the external sphincter. A transverse incision is made anterior to the anus for dissection into the rectovaginal space. A sagittal incision is made posteriorly to enter the retrosphincteric space. From the posterior incision, it is tunneled through the ischiorectal space to meet the levator muscles anteriorly. Forceps are introduced from the anterior incision posteriorly through the puborectalis muscle and ischiorectal space. The mesh is grasped and pulled through. The same procedure is done on the other side. The limbs of mesh are overlapped and sutured together into the rectovaginal space and attached to the perineal body. The chance of erosion is minimized.

Table 1. Surgical Techniques for Rectal Prolapse

Perineal	
Postanal repair	Parks,1975
Perineal sling	Thiersch, 1891
Transanal mucosal sleeve resection	Rehn-Delorme 1964
Rectosigmoidectomy	Miles 1933, Altemeier 1971
Perineal rectopexy	Ivalone – Rodgers 1987
	Teflon – Wyatt 1981
	Sutures – Thomas 1975
Modified Kraske approach (posterior rectopexy)	Wyat – 1981
Perineal resection	Mikulicz – 1888, Altemeier 1971
Transabdominal	
Pelvic floor reconstruction	Douglas closure – Moschowitz 1912
	Anterior levatorplasty – Graham 1942
	Anterior-posterior levatorplasty – Goligher 1970
	Abdomino-perineal levatorplasty – Hughes 1957
	Total pelvic mesh repair – Sullivan 1990
Rectopexy	
Posterior fixation	Suture rectopexy – Sudeck 1923
	Posterior Ivolone sling rectopexy – Wells 1959
Anteior fixation	Sigmoidopexy – Pemberton 1937
	Anterior teflon sling – Ripstein 1952
	Ventral teflon sling – Nigro 1958
	Ventral fascia bridging – Lahout 1956
	Ventral mesh rectopexy – D'Hoore 2004
	Lateral mesh rectopexy – Orr 1953, Loyque 1984
	Lig. Rotundum fixation – Girona 1986
Resection	Anterior resection – Muir 1962
	Rectosigmoidectomy-Miles 1933
	Sigmoid resection-rectopexy – Frykman-Goldberg 1969
Combined abdominoperineal approach	Dunphy

Pros and Cons

The posterior half of the ring of mesh lies in the infralevator retrosphincteric and ischiorectal space. The anterior half passes through the puborectalis muscles to enter the supralevator

rectovaginal space. Thus, it supports the anal canal. The chance of it eroding through is minimized.

Delorme's Operation

It is described by Delorme in 1990. The patient is placed in the lithotomy position with a steep Trendelenburg tilt. The perineal region is infiltrated with a local anesthetic such as 0.5% lidocaine with 1:200000 epinephrine. Intravenous sedation is helpful. The bowel is exteriorized to its maximum and marked with stay sutures. A mucosal circumferential incision is made 1-2 cm proximal to the dentate line. The submucosa is infiltrated with 0.5% lidocaine with adrenaline 1:200000 to facilitate mucosal stripping and to reduce bleeding. A circumferential stripping of the mucosa of the everted rectal wall is made to the apex of the prolapse with scissors or electrocautery and resected. About 10-25 cm or more of mucosa may be stripped. The sleeve of the exposed circular muscle is vertically plicated by taking bites of the muscle with interrupted 2/0 PDS, Vicryl or Prolene. Three to 5 bites of the rectal muscle may be taken depending on the length of the prolapsed bowel. About 10 to 14 vertical sutures are necessary. Each suture begins just proximal to the incised mucosa above the dentate line and continues proximally to the level of the dissected mucosa. After careful hemostasis, the sutures are tied. A doughnut of plicated rectal muscle is created. The proximal and the distal edges of the mucosa are anastomosed using interrupted 3/0 Vicryl sutures. The doughnut is inverted into the rectum.

Pros and Cons

It does not correct the underlying anatomic abnormality. Recurrence rates are 5%-40%.[9] The procedure can be repeated if recurrence occurs. It is mostly suitable for prolapses about 5-6 cm in length. Bleeding may occur, late stenosis may develop, and rectal compliance may be lost. It is recommended only for very poor-risk patients with coexisting severe diseases and who are unsuitable for abdominal surgery. Anterior and posterior repair of the pelvic floor should be performed to reduce recurrence.[10]

Altmeir's Perineal Rectosigmoidectomy

It is described by Altemeier in 1971. Lithotomy with a steep Trendelenburg tilt or jack-knife position is used. Usually, general anesthesia is required. A full-thickness circumferential incision of the rectum is made about 2 cm proximal to the dentate line. The prolapsing bowel is pulled through the anal canal as far as possible and everted on the perineum. An incision is made on the anterior wall of the prolapse at an adequate distance from the dentate line at the apex of the prolapse, dividing the mucosa and the muscle. Stay sutures are placed on the cut edges of the bowel to prevent it from slipping back. The anterior rectovaginal (in females) or rectovesical (in males) pouch – Douglas pouch – is seen, and the peritoneum is divided over the anterior and lateral sides of the prolapse, and 2 stay sutures are placed on the proximal edges of the peritoneum. The prolapsed bowel is lifted up anteriorly to expose the posterior wall and the anorectal junction is freed. The rectum is entirely mobilized, puborectalis and levators are exposed, and posterior and/or anterior levatorplasty sutures are placed and tied if required. They should not be too tight. Rectum and sigmoid colon are withdrawn, the sigmoid mesentery is divided and ligated, and all of the bowel is pulled down tightly until there is no redundancy. The sigmoid colon is resected, and held by clamps or stay sutures are put to prevent retraction. The rectum is resected 2-3 cm above the dentate line, and intra-anal colo-anal anastomosis is completed with 2/0 or 3/0 Vicryl or silk sutures. The peritoneum is closed with interrupted or continuous 2/0 Vicryl sutures. If a circular stapler is used, the rectum should be incised about 3 cm proximal to the dentate line.

Pros and Cons

It is indicated in cases of a strangulated or gangrenous prolapse. The high recurrence rate is 0%-50%.[11,12] Postoperative resting and squeeze anal pressures are low. A feeling of urgency and fecal soiling may occur due to loss of rectal capacity. This technique may cause further damage to the altered anatomy and function.[12] It removes the prolapsing bowel and enables fixation of the bowel in the pelvis with subsequent fibrosis.

Perineal Proctectomy, Posterior Rectopexy, and Postanal Levator Ani Muscle Repair

After a perineal rectosigmoidectomy is performed, a posterior rectopexy is executed by approximating the seromuscular layers of the bowel to the precoccygeal fascia above the levator ani muscles with 2/0 silk interrupted sutures. The levator ani muscles are approximated posteriorly with 3/0 Prolene sutures. Anterior approximation of the levator ani muscles may also be added.

Pros and Cons

Constipation improves and incontinence improves. Rectal capacity decreases. The major dissatisfaction after surgery is frequent defecation, fecal soiling, persistent or worsened fecal incontinence, and recurrence. It is not recommended for patients with diarrhea and incontinence.[13]

Modified Kraske Approach – Perineal Posterior Rectopexy

It is described by Wyatt in 1981. It is a perineal posterior rectopexy. The patient is in the jackknife position. The rectorectal space is approached through the anococcygeal raphe. The coccyx can be detached and removed to facilitate the exposure of the rectum. A piece of synthetic mesh, 8 × 10 cm, is sutured to the sacral periosteum as high as possible with multiple sutures. The edges of the mesh are sutured to the side walls of the rectum

Perineal Proctectomy, Posterior Rectopexy, and Levator Ani Muscle Repair- Prassard 1983

It can be performed under regional anesthesia. Posterior rectopexy is performed using 2/0 silk sutures through the seromuscular layer of the bowel and precoccygeal fascia above the levator ani muscles. The levator ani muscles are approximated posteriorly using 3/0 Prolene sutures. The long bowel is resected, and anastomosis is done.

Pros and Cons

Anorectal angle is recreated. The long bowel is resected. The rectum is fixed.

Pouch Perineal Rectosigmoidectomy And Rectopexy

The patient is in the jackknife position. The prolapsed bowel is retracted anteriorly. The posterior anal canal is divided above the dentate line. Waldeyer's fascia is divided, the pelvic floor is seen, and dissection is continued over the presacral fascia up to the promontorium. Two limbs of the puborectalis muscles are approximated with sutures posteriorly. The mesorectum is divided. Rectopexy sutures, about 2-3 are placed in the proximal rectum and presacral fascia. The prolapse is retracted posteriorly, and anterior anal canal is divided. The Douglas pouch bulges into the wound, the peritoneum is divided, and the sigmoid colon is pulled through the incision. Stay sutures are placed at the most proximal level of the sigmoid colon. The sigmoid mesentery is preserved. The prolapse is cut at the proximal rectum and above the pexy

sutures with a linear stapler. An enterotomy is opened on the lowest part of the to-be J pouch, and a side-to-side colonic pouch is constructed with a linear stapler. The pouch is replaced into the pelvis. An end-to-side coloanal anastomosis between the J pouch and the lower rectum is performed with interrupted sutures.

Pros and Cons

Sigmoid colon and mesentery is preserved. A stapled sigmoid pouch is formed. The pouch is fixated to the presacral fascia. Total pelvic repair is performed.[14]

Pelvic Floor Repairs

This repair alone is based on the concept that the prolapse occurs secondary to a weakness in the pelvic floor. It fails to correct the prolapse.

Perineal Rectopexy

In high-risk patients, it can be done in the lithotomy or jackknife position. A curved postanal incision is made approximately 6 cm behind the anus. The tip of the coccyx may be removed. After full posterior mobilization of the rectum, the pelvic floor is accessed. The mobilized mesorectum is fixed to the presacral fascia with nonabsorbable sutures. This procedure is usually combined with a postanal repair. A suction drain is placed in the presacral space.

Pros and Cons

Fixation can be difficult, with higher recurrence rates for perineal procedures ranging between 14% and 27% within 4 years after surgery.[15]

The Abdominal Repairs

In outcome, it is superior to perineal operations. It may be combined with a perineal procedure where it is easier to repair the pelvic floor. The abdominal approach is now considered the standard (Table 2).

Sigmoid Exclusion Procedure

Rectum is fully mobilized in the pelvis. Rectum is sutured to the posterior rectus sheath. Sigmoid colon is extraperitonealized behind the rectus muscle. Fecal impaction, fecal fistula, and bowel obstruction may develop. Complication rates are high. Sigmoid colon may be placed in a tunnel fashion from the posterior parietal peritoneum above the pelvic entrance, though it is not popular.

Pelvic Floor Repair Abdominally

Rectum is fully mobilized anteriorly and posteriorly. Originally, levators are repaired anteriorly, but lately, the pelvic floor is repaired behind the rectum. Mostly, the muscles are to thin to hold the sutures and secure the strength.

Pros and Cons

Failure rates are high. It is difficult to perform. Access is poor.

Rectopexy

It is the operation of choice for most surgeons. If the prolapse is an invagination, fixation of the responsible part should cure the problem. Recurrence rates are low. Continence is restored. What to use for fixation and whether it should it be combined with colonic resection or pelvic floor repair are common considerations.

Suture Rectopexy

It is first described by Sudeck Daher–Cutait in 1959. The rectum is mobilised down to the levator muscles, preserving the lateral ligaments. The lateral ligaments are sutured to the presacral fascia below the promontorium. The rationale for using sutures is to keep the rectum in its normal position and its eventual fixation to the sacrum by scar tissue.

Ripstein Operation – Anterior Rectopexy

Described by Ripstein and Lanter in 1963, it is believed that the rectal prolapse is an invagination and results when the rectum loses its attachments to the sacrum and becomes a straight tube. The pelvic floor defects are secondary. Therefore, if the straightening of the rectum is prevented by fixing the rectum to the sacral curve, it would not reoccur.[16]

Rectum is fully mobilized down to the levator muscles and to the tip of the coccyx by opening the lateral peritoneal folds. A 5 cm wide rectangular synthetic mesh (Teflon, Marlex, Prolene) ribbon is placed around the rectum approximately at the level of peritoneal reflection. The sling can be made of Gore-Tex, polyvinyl alcohol sponge (Ivalone), synthetic nonabsorbable mesh such as polypropylene, and absorbable mesh with polyglycolic acid or polygalactone. Teflon is soft but holds the sutures well. Polypropylene is stiffer but more inert. Polyvinyl alcohol becomes very soft when wet and holds the sutures poorly. The edges of the ribbon are sutured to the presacral fascia with nonabsorbable sutures approximately 5 cm below the promontorium, 1 cm from the midline on both sides**.** The rectum is pulled upward and the front side of the mesh is sutured to the rectum to prevent the sliding of the mesh. These sutures should not have full thickness of the bowel wall. The mesh is draped around the anterior wall of the rectum is shaped like an apron, long part placing downward, and its edges are sutured to the rectal wall. The sling should be loose enough to allow 2 fingers to pass between the bowel and

Table 2. Comparison of Perineal and Abdominal Rectal Prolapse Surgeries

Types of Surgery	Recurrence Rate	Complications – Cons
Perineal-Thiersch	20%-60%	High
Perineal-Delorme	5%-40%	High
Perineal-Altmeier	0%-50%	High
Abdominal-anterior rectopexy	Low	Fecal impaction, presacral bleeding, stricture, pelvic infection, small bowel obstruction, rectal erosion-fistula, recurrence of mucosal prolapse
Abdominal-posterior suture rectopexy	Low	Worsens complications
Abdominal-resection rectopexy	2%-8%	Anastomosis and presacral bleeding

the sacral fascia. The peritoneal defect is closed, thus burying the mesh beneath the peritoneum.

Pros and Cons

Anterior sling might prevent the expansion of the rectum, causing defecation problems. Fecal impaction, presacral bleeding, stricture, pelvic infection, small bowel obstruction, rectal erosion-fistula, recurrence of mucosal prolapse are among the possible complications.

As a modification, the mesh is draped around the anterior wall of the rectum is shaped like an apron, long part placing downward, and its edges are sutured to the rectal wall. In 1987, McMahon and Ripstein modified the procedure. Instead of the anterior placement of Goretex, they placed it behind and sutured it to the sacral concavity and to the sides of the rectum.

Posterior Suture Rectopexy

Supine or lithotomy positions are used. A steep Trendelenburg tilt is helpful. A low midline incision is used. The anterior peritoneal pouch is not divided. The first important point is to enter the retrorectal space by incising the posterior peritoneal surface at the base of the junction of the mesosigmoid-mesorectal junction anterior to the sacral promontorium. By using blunt and sharp dissection, the retrorectal plane is entered, and dissection goes down to the tip of the coccyx. Lateral ligaments are divided or left intact. The rectum is pulled up. The posterior aspect of the rectum is fixed to the presacral fascia with sutures. If only sutures are to be used, 3 or 4 prolene sutures are placed through the presacral fascia and the mesorectum in the midline.

The rectum is pulled upward, and the lateral edges of the mesh are sutured to the lateral rectum and divided lateral ligaments on both sides. The anterior wall is free, so rectal distension is not impaired. Care should be taken to identify the ureter. A suction drain is placed in the pelvis.

Some authors incise the Denonvillier's fascia, and rectovaginal septum is dissected to the level of the pelvic floor. The pouch of Douglas dissection can be carried out between the anterior aspect of the rectum and the posterior aspect of Denonvillier's fascia. Anterior suspension of the uterus, if present, helps dissection. Enough peritoneum on the vaginal surface should be left to allow for reperitonialisation over the mesh, which results in elevating the pouch of Douglas.

Pros and Cons

The prolapse recurrence is low, incontinence improves, and constipation worsens in most of the patients.[17] It is theorized that long sigmoid colon kinks over the rectal fixation, delays transit and worsens constipation. This procedure can be performed laparoscopically with good results.[18]

Ivalon Sponge Rectopexy

It is first described by Wells in 1959. Ivalone sponge is a hydroxylated polyvinyl acetal sponge. The patient is in the lithotomy position. The peritoneum on each side of the rectosigmoid, beginning about 5 cm above the pelvic brim, is incised, presacral space is entered at the level of the sacral promontory. The rectum is fully mobilized to the level of the coccyx. Anterior mobilization is done by continuing the lateral peritoneal incisions to join in the deepest level of the pouch of Douglas. The seminal vesicles or the vaginal vault is reached easily. The upper portion of the lateral ligaments on each side is divided. A rectangular piece of Ivalone sponge is moistened in saline to make it easy to handle and placed in the presacral space and partly wrapped over the lateral walls of the rectum. Three sutures of 2/0 vicryl are passed through the sponge and the presacral fascia. The sponge is sutured to the sacrum and the rectal walls.

Pros and Cons

The anterior rectal wall is left free to expand. The idea is that the intense fibrotic reaction produced by the sponge may fix the rectum to the sacrum. The pelvic sepsis rate is high. If infection occurs, the sponge should be removed. Apart from the sepsis, the results are good. The presacral vessels must be carefully avoided while fixing the mesh to the presacral fascia. Synthetic mesh made from woven monofilament fibers are superior to Ivalon. They are tolerated better and they are permanent.

Notaras' Posterior Mesh Rectopexy

A rectangular piece of monofilament is used. Synthetic meshes made from woven monofilament fibers are superior to Ivalon. They are tolerated better and they are permanent. The patient is supine and in the Trendelenburg position. A lower midline incision is made. The rectum is mobilised down to the levator muscles. A rectangular mesh of 3.5 × 2, 5 × 7 or 10 cm, depending on the volume of the rectal mesorectum is prepared. About 3-4 interrupted sutures are placed in the midline of the sacrum on or below the promontory and through the mesh. The mesh is placed behind the mesorectum, covering approximately 1/3 of its posterior circumference. The mesh is first sutured to the sacrum. Then its upper edge is sutured to the sacral promontory. The wings of the mesh are wrapped around both sides and sutured with 3/0 monofilament synthetic sutures to the posterolateral walls of the rectum and lateral ligaments on both sides. A closed-suction drain is placed in the presacral space.

Pros and Cons

The mesh is hidden in the presacral space and do not have contact with the intraperitoneal space or the intrabdominal organs. The anterior rectal wall is free to distend. Constipation may worsen.

Resection Rectopexy (Frykman–Goldberg 1955)

Median subumbilical incision is used. The rectum is completely mobilized down to the levator muscles and drown up. The lateral ligaments are sutured to the periosteum of sacrum with 2/0 silk sutures. The peritoneum lateral to the descending and sigmoid colon is incised, and the left colon is mobilized. The excess length of the colon is resected, preserving the major vessels. End-to-end colo-rectal anastomosis is done. The excess peritoneum of Douglas' pouch is excised, and the trimmed peritoneal edges are sutured around the rectum. Fixation of the rectum is achieved by perianastomotic fibrosis and with sutures fixing the lateral sides of the mesorectum to the sacral promontory and lateral ligaments.

Pros and Cons

The straight left colon, supported by the phrenocolic ligament proximally and fixed by rectopexy is thought to prevent recurrence. The straight course of the colon avoids kinking and torsion above the fixation, so constipation improves and continence improves. It carries the risk of anastomosis and presacral bleeding. In patients with slow transit time and constipation, subtotal colectomy is recommended. The recurrence rate is low (2%-8%).

Lateral Mesh Rectopexy – Orr-Loyque

Rectum is completely mobilized anteriorly and posteriorly. A mesh strip is sutured laterally on both sides of the rectum. The mesh strips are then sutured under tension to the promontory.[19]

Ventral Mesh Rectopexy – D'Hoore 2004

The dissection is only ventral to the rectum in the rectovaginal plane down to the pelvic floor without lateral or posterior mobilization. The rectum is attached to the sacrum by a mesh that is sutured to the anterior of the rectum.

Pros and Cons

A supraanal rectocele, if present- can be corrected. The rectovaginal septum is reinforced, which prevents anterior recto-rectal invagination. A colpopexy is performed. It may be indicated in full rectal prolapse with rectocele, outlet obstruction, and vaginal vault prolapse. There is insufficient evidence to identify the best fixation method used for rectopexy. Fixation of the rectum to the sacrum is designed to restore the physiological position of the rectum.

Resection Alone

Partial resection of the rectum and sigmoid colon. The lateral peritoneum is incised up to the left flexura and the colon is mobilized. The long colon is resected, and anastomosis is accomplished without tension.

Pros and Cons

Continence problems may continue. Colonic resection is necessary in rectal prolapse surgery; shortening of the left colon should prevent recurrence. The colon held in place by the phrenocolic ligament should be difficult to slide down. Recurrence increases with time.

Wells Procedure – Laparoscopic Resection Rectopexy

Berman was the first to report a laparoscopic retropexy in 1992, but Wells popularized laparoscopic resection retropexy. The presacral space is entered, and the rectum is mobilised down to the pelvic floor. The lateral ligaments are not divided. A precut mesh is introduced through a port. The mesh is tacked or sutured to the promontory in the midline. The edges of the mesh are sutured to the lateral mesorectal tissue. For resection, the upper rectum is transected with an endoscopic stapler and passed out through a 4 cm left lower quadrant muscle-splitting incision. The proctosigmoidectomy is completed, a circular stapler is inserted into the proximal bowel, and the proximal colon is returned to the abdomen. The anastomosis completed.

Pros and Cons

When costs for operation time, staff, laparoscopic equipment, and hospital stay were calculated, laparoscopic operation seems less costly than open operation. It also accounts for shorter hospital stay.[20]

Abdomino-Perineal Approach – Combined abdominoperineal approach

At first, it was a 2-staged procedure. Through a perineal approach, the prolapsed rectum was resected, the hernial sac removed, and the levator ani muscle was sutured anterior to the rectum. A few days later, the abdomen was opened, the rectum mobilized, the transversalis fascia sutured, the hernial sac and Douglas' pouch closed by circular sutures, and the pelvic colon was fixed to the lateral wall of the pelvis. Later, 2 procedures were performed by 2 surgeons simultaneously.

Treatment of Acute Incarcerated Prolapse

Reduction is possible and desirable in most cases. Failure to reduce may lead to strangulation and necrosis. If strangulation occurs, a perineal rectosigmoidectomy should be done.

Incomplete Prolapse – Internal Invagination

The pelvic floor may be normal, and the anal canal may be tight. The upper part of the rectum unfolds into the anal canal or rectal ampulla. The patient may have difficulty in defecation, often described as a sensation of incomplete evacuation, rectal pain, tenesmus, bleeding, mucus discharge, and soiling.[21] This is a frequent observation in defecography among asymptomatic individuals.

Sigmoidoscopic findings may include solitary ulcers, hyperemia, and edema of the mucosa of the anterior rectal wall for a distance of 8-10 cm from the anus. Defecography may help identify internal invagination. Weak pelvic floor, overactive pelvic floor and external sphincter, wide anorectal angle, short anal canal, straightened rectum, and marked perineal descent are features seen in defecography. Delayed pudendal nerve conduction time is observed. Uterine descent is frequent. Urinary incontinence may coexist. A long sigmoid colon is one of the most prominent features. It is seen more common in elderly women. Parity does not affect it. Prolapse is a problem in some children with spina bifida and other cauda equina lesions. Conservative management is preferred. Rectopexy, Ripstein's procedure, Delorme's procedure, and resection rectopexy have been performed with mixed results.

Recurrent Prolapse

Generally, the risk of recurrence is higher after perineal operations than after abdominal operations. If full-thickness rectal prolapse recurs, the patient should be evaluated for constipation and other pelvic abnormalities. For this purpose, manometry, defecography, barium enema, and colonic motility studies may be required. The same operation as the previous one can be performed. If abdominal rectopexy was done, a redo abdominal rectopexy with or without sigmoidectomy can be considered. If perineal rectosigmoidectomy was performed, redo perineal resection or abdominal pexy may be suggested. Excision under local anesthesia may be performed. For persistent problems of incontinence, observation for 6-12 months is recommended. If the symptoms fail to improve and are severe, further solutions should be sought. If there is a solitary ulcer due to prolapse, prolapse repair will heal it. If the ulcer is not due to prolapse, it should be treated as a separate pathology. For internal invagination, defecating proctography is performed, but surgical repair is generally avoided. The patient should be evaluated for their symptoms, and if combined urogenital prolapse exists, a multidisciplinary approach is useful. Total pelvic mesh repair involves placing mesh from the sacrum to the perineal body and around the vagina. The perineal approach to rectal prolapse can be combined with perineal colporrhaphy. Although there is no specific algorithm to follow, an abdominal approach is strongly recommended for younger and fit patients, while a perineal approach is suggested for unfit patients are suggested strongly.

Choice of Surgical Therapy

Surgery is the only treatment, but ideal treatment is still not defined and remains controversial and should be tailored to the patient. Open, laparoscopic, and robotic surgery have similar results.[22] It depends on the age, sex, general health, coexisting systemic and gastrointestinal disorders. A full history of the patient and symptoms may determine the choice of surgical procedure, especially if constipation, obstructed defecation, or fecal incontinence is present.

In elderly unfit patients with coexisting severe health problems, pelvic floor repair, perineal rectopexy, or Delorme's procedure are better choices. Pouch-perineal rectosigmoidectomy with pelvic

floor repair is advised by Keighly. Altemeier's procedure or rectopexy is chosen for prolapse >5 cm in length. Delorme procedure is usually performed for smaller prolapse.[23] Today, most of the elderley patients with coexisting diseases are managed under general anesthesia which enables the surgeon to perform abdominal surgeries. For young and/or fit patients, a posterior rectopexy with sigmoid resection is considered good. In young patients with severe constipation and slow colonic transit times, subtotal colectomy with rectopexy should be considered.[6]

Several authors think that sigmoid or anterior resection with rectopexy provides long-term control of rectal prolapse with an acceptable recurrence rate and improvement in constipation and continence.[24] The placement of foreign materials is associated with an increased risk of infection, stenosis, and constipation. Dividing the lateral ligaments is associated with a decreased recurrence rate but an increased constipation rate.[25] The abdominal surgery can be performed laparoscopically. Laparoscopic surgery is recommended since it has less operative pain, rapid recovery, and shorter postoperative hospital stay[18]

An individualized approach is recommended for every patient, considering the age, health status, and underlying morphological and functional disorders. The choice of procedure depends on the experience of the surgeon.

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