External rectal prolapse: Which operation and Why?

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Abstract

Background: External rectal prolapse is a rare condition and the only treatment option is surgery. In 10-50% of patients (women) co-exist other anatomical and functional pelvic floor disorders and eventual should be corrected in the same time, requiring complex rectal and pelvic operations by a multidisciplinary team.

Material and methods: A review of the literature based in Google Scholar and PubMed medical database was performed. The predominant surgical procedures in the literature were identified and the associated functional and anatomical pelvic floor disorders coexisting with the external rectal prolapse, the usefulness of preoperative examinations and the final surgical treatment were reviewed. Cross-references of the published articles were used to accomplish this review study.

Results: There is a great variety of proposed surgical procedures for external full-thickness rectal prolapse. There is no surgical "gold standard" and the approaches vary. The procedures can be categorized into two main broad groups, abdominal and perineal ones. An important distinguishing factor is the potential use of prosthetic mesh which is popular but also involved in some rare but serious complications. The presence of comorbidities and individual patient characteristics makes the choice of procedure particularly complex. The input of pelvic floor multi-disciplinary team is required when prolapse of middle and anterior pelvic compartments is present. The number and variation of surgical options makes the process of the patient informed consent very important for the restoration of normal quality of life.

Conclusions: External rectal prolapse is a condition which requires meticulous assessment and the surgical procedure of choice needs to be individualized according to the patient requirements.

Background

External rectal prolapse is the protrusion of the rectum through the anal canal. This condition can be corrected only by surgery. It is a rare condition mainly affecting the extremities of age; children are affected at the age of 3 yrs [1], below this age the condition can be managed conservatively but after this age children are candidates for surgery. The condition equally affects males and females.

The condition is more commonly seen in older ages with an incidence of 2.5/100.000 population [2], mainly affecting old woman with a mean age at 69-70 yrs and a female/male ratio: 9/1. This is a rare condition in middle age patients.

It seems that the number of patients reported having surgical intervention increases in the last two decades [3] alongside the mean age of patients (at round 73 yrs old) and laparoscopic surgical procedures as treatment option.

External rectal prolapse may coexist [4] with other pelvic organ prolapse. Combined pelvic floor prolapse repairs may be occasionally required in females.

Associated anatomic and pelvic floor disorders in patients with external rectal prolapse

External rectal prolapse, also known in the literature as *rectal procidentia, complete rectal prolapse or full thickness rectal prolapse* is a benign condition of unclear etiology but it may coexist with several other conditions which may also have an implication in surgical management.

Pelvic anatomic disorders: The most common associated conditions are the diastasis of puborectalis muscles, an enlarged and deep pouch of Douglas known as peritoneocele, the laxity of the lateral ligaments of the rectum, the lack of fixation of the rectum on sacrum, a patulous anal sphincter, neurological disorders and a redundant sigmoid colon.

Other pelvic floor disorders coexisting with external rectal prolapse: They are anatomical of functional disorders of the anterior or middle pelvic floor compartment: Cystocele with urinary dysfunction/incontinence, vaginal and uterine prolapse, rectocele or enterocele with outlet obstruction symptoms and incomplete bowel emptying, and the descending perineum. These conditions necessitate an uro-gynecologic assessment and multi-disciplinary surgical intervention. The associated pelvic floor conditions in women increase with age [5] with a range of incidence between 23.7% and 49.7% over the age of 80. Obesity is a known risk factor.

Despite laparoscopic surgery today being feasible [6] for the treatment of external rectal prolapse and also associated pelvic floor disorders, mesh-related complications and the resulting long term consequences should not be underestimated [7,8].

Physical examination of the perineum, analysis of clinical symptoms and connection of symptoms with surgery of the external rectal prolapse

Patients with external rectal prolapse are a heterogeneous group regarding the sex, age and presenting symptoms and clinical signs. A meticulous personal history and physical examination of the anterior, middle and posterior compartment of the perineum guides further diagnostic and surgical management.

The most common symptoms are fecal incontinence and constipation in more than 50% of patients. The prolapsed tissue may determine anal sphincter damage and permanent stimulation of the rectoanal inhibitory reflex resulting in fecal incontinence, while constipation may be explained by the mechanics of intra-rectum obstruction from prolapsed tissue that may by increased in straining conditions. Many patients with external rectal prolapse present with anal sphincter neuropathy.

Other conditions associated with external anal prolapse are long term constipation, straining during defecation, long term diarrhea, pregnancy and childbirth, previous pelvic surgery, a history of frequent anal intercourse and redundant colon. A redundant colon is often found in young patients with psychiatric disease and severe constipation; in this special group of young patients [9], 61% had redundant colon (found intra-operatively) and more than 40% psychiatric disease.

In patients with external rectal prolapse and severe constipation some surgical maneuvers should be avoided, such as the posterior mobilization of the rectum and division of the lateral ligaments of the rectum as they cause constipation by damaging the sacral nerves. When there is co-existence of constipation with redundant colon, patients may benefit from a resection-rectopexy surgical procedure.

The assessment of incontinence is important; when fecal incontinence exists, external rectal prolapse should be treated by surgery without delay; an improvement in incontinence is expected after surgery, but in patients who have already developed anal neuropathy (decreased pudendal nerve terminal motor latency) incontinence may persist or even increase. Concurrent rectal resections with low anastomosis should be avoided as to not increase the incontinence. On the other hand division of lateral ligaments may be beneficial in the post-operative functional outcomes when preoperative incontinence symptoms dominate (anti-incontinence effect).

External macroscopic examination of the perineum and finger examination may reveal a patulous anus with decreased anal tone and proctoscopy may sometimes reveal a solitary rectal ulcer.

The length of the external rectal prolapse should be assessed. The cut-off 5 cm from the dentate line is used in the selection of patients for the more suitable technique of a perineal surgical procedure. Patients with less than 5 cms length external rectal prolapse may be selected for perineal Delorme's procedure while patients with a longer length of external rectal prolapse are suitable for perineal Altemeier's procedure or for abdominal surgery.

Non-operative management may improve some symptoms as constipation and incontinence, indeed

biofeedback [10], may significantly improve constipation and fecal incontinence symptoms when the anal sphincter system reserves a grade of integrity and functionality. Biofeedback is often applied postoperatively to improve the functional outcome.

Conservative measures as treatment option should not be a factor of delay of surgery in external rectal prolapse. Long delay in surgery is associated with increased possibility for fecal incontinence [11] and poor baseline continence [12] with prolonged pudendal nerve terminal motor latency and present more recurrences after surgery. This is the opposite with internal rectal prolapse (intussusception Oxford Grade I-IV) where conservative management is always the first line treatment.

Not all other pelvic compartment findings require concurrent surgery. Enterocele and rectocele do not require treatment if asymptomatic.

Pre-operative investigations in external rectal prolapse

Not all patients with external rectal prolapse will benefit from an extensive pre-operative workup as the clinical diagnosis is obvious. In selected patients they are useful for a diagnosis of other co-existent pathologies or to help determine the choice of surgical procedure. The most common in use are the following:

Endoscopy: As the majority of patients are of old age, there is need of exclusion of a sigmoid neoplastic lesion [14] as the initial cause of the rectal prolapse. In younger ages with severe constipation, endoscopy indicates if a redundant colon coexists with the external rectal prolapse. A solitary rectal ulcer can be seen and biopsied in many cases but it does not alter the diagnosis.

Anorectal manometry: Is useful in selected patients with severe defecatory disorders and mainly fecal incontinence and rectal structural abnormalities. The procedure may be completed with the rectal balloon expulsion test. Patients with rectal prolapse [15] are differentiated according to rectal and anal pressures at rest, during squeeze, and anorectal gradient evacuation in two different phenotypes.

Ttansrectal ultrasound is useful in selected patients with fecal incontinence and pelvic organ prolapse and with anorectal function tests may differentiate [16] functional from anatomic anal sphincter disorders. Ultrasounds with manometry and pudendal nerve terminal latency studies [17] evaluate sphincter injuries and differentiate anatomic lesions of the anal sphincter from other etiologies of fecal incontinence. In patients with external rectal prolapse and incontinence, the severity of anal injuries may by classified in four grades [18] and the improvement in continence state after surgery may be predicted as it is strongly depended from the grade of anal sphincter injury.

Pudendal nerve terminal latency tests: It is rarely used and only when incontinence is present. Decreased pudendal nerve terminal latency may be linked with a higher rate of incontinence after surgery [19].

Fluoroscopic defecography: This is a useful examination to assess the height of origin of the prolapse and the presence of co-existent sigmoidocele or enterocele. Their presence may influence the choice of

surgery towards an abdominal procedure. For younger patients and for females MRI proctography is often preferred so that radiation is avoided and prolapse of other compartments can be diagnosed.

Dynamic MRI proctography, with rectal and vaginal contrast allows assessment [20] of anatomic and functional disorders of all three pelvic compartments at the same time. Video defecography and dynamic MRI proctography [21] are complementary imaging studies; the former has a higher accuracy for sigmoidoceles and enteroceles and is cheaper but it includes radiation. The latter is superior to assess symptoms of the middle and anterior compartment but it is more expensive. There is ongoing debate about the sensitivity and specificity of each test. The choice partly relies on costs and local availability.

CT for pelvic floor disorders: It is not common alternative imaging study [22] and it is mainly used when contraindication for MRI exists.

Surgery of the external rectal prolapse

External rectal prolapse can be corrected only by surgery. In the literature there are more than 100 procedures for the surgical therapy. Cochrane database [23,24] systematic reviews have failed to identify the best surgical operation.

Surgical procedures are broadly divided into abdominal or perineal. The general perception is that perineal procedures may be more suitable in the elderly and high-risk patients [25] and probably they present [26] slightly higher recurrences rates than abdominal procedures. However it should be remembered that even perineal procedures carry a small risk of mortality in the very unfit. Other studies do not report any significant differences [27] between perineal and abdominal approaches regarding the morbidity and functional outcomes.

Operations can be divided in either resection of the prolapse or suspension and fixation of the rectum (rectopexies).

The perineal operations aim to resect, totally or partly, the prolapse; those are the Delorme, the Altemeier and the STARR procedures.

An anterior resection of the rectosigmoid is the main abdominal resection technique. There is the variation of the Frykman-Goldberg procedure which combines resection with rectopexy.

In abdominal surgery the laparoscopic techniques have gained ground in the last decade over the open ones because they are considered to have some advantages in earlier discharge and less pain [28] with [29] morbidity, incontinence, constipation or recurrences rates compared with open surgery. However, it should be remembered that in open surgery a midline laparotomy is not necessary and if a hypogastric Pfannenstiel incision with separation rather than incision of the recti is performed, then the incision-related pain and morbidity should not be more than that of a caesarian section.

The most common and popular procedures are the following:

Abdominal rectopexies

Laparoscopic ventral mesh rectopexy (D'Hoore) -LVMR: The LVMR was proposed [30] by D'Hoore in 2004. The procedure is well described [31] and we should clarify that in this paper we discuss its use in the context of external rectal prolapse only. However, the procedure has been popular also for internal rectal prolapse with Obstructed Defecation Syndrome.

The main advantage of LVMR is supposed to be the decreased risk of de novo development of constipation compared to posterior rectopexy. Another advantage is theoretically the potential to combine LVMR with a sacro-colpopexy in case of coexistence of a middle compartment prolapse. It should be emphasized that sacro-colpopexy, in terms of indications and risk assessment, requires the input of a gynaecologist and of the pelvic multi-disciplinary team and should not be performed by colorectal surgeons without exercise of discretion and without patient informed consent about potential complications such as dyspareunia and urinary dysfunction.

A disadvantage of LVMR that has caused a lot of concern is the mesh-related complications. The use of mesh carries a small but genuine risk of erosion into the vagina or rectum and can cause grave morbidity, multiple re-operations and even a permanent stoma. Not all mesh has the same risk of erosion: the polyester mesh [32] has been shown to have a higher risk of erosion and should be avoided at all costs. The mesh that is considered the lowest risk for erosion is the titanium-coated.

Biologic mesh [33,34] has been used but, apart from the fact that it is very expensive, it can also cause erosion, albeit with lower incidence.

Lastly, another factor of erosion is the sutures used to secure the mesh. Polyester sutures [35] are thought to carry the highest risk of erosion. Absorbable PDS sutures are considered lower risk.

The dissection line avoid latero-posterior mobilization of the rectum, the space between vagina and rectum is dissected to perineal body, the mesh is placed and sutured on the ventral rectum after retraction and the mesh is suspended and fixed on the anterior longitudinal ligament along the sacrum or on the promontory by protaks. A deep cul-de sac may be removed and follows closure of the peritoneum.

The procedure improves constipation [36] in patients with preoperative constipation, does not create de novo constipation and the avoidance of posterior mobilization of the rectum protects autonomy nerves offering better postoperative functional outcomes. However, despite all precautions constipation after rectopexy may be incidentally observed and may be justified by the following parameters; the division of the lateral ligaments of the rectum [37] that may increase the transit time, the autonomic nerve injury and the acute angulation of the sigmoid because of fixation of the mesh on the sacrum.

The technique of rectal mobilization [38] probably does not influence recurrence rates. In terms of recurrence rates in the short and the long term, recurrence between 0-5% is an acceptable rate.

A recent meta-analysis [39] showed the posterior rectopexy to be superior in terms of recurrence to

the perineal repairs but equal to the LVMR.

Functional long term outcomes [40] are thought to be better in ventral mesh rectopexy than in posterior mesh rectopexy. The procedure has similar results [41] with the robotic surgery except the higher cost and time of surgery.

The procedure is very popular and the definitive indication [42] for use is the external rectal prolapse.

Other relative indications for use are the symptomatic high-grade internal rectal prolapse and solitary rectal ulcer syndrome. Absolute contraindications for use are pregnancy, no demonstrable pelvic anatomical problem, severe intra-abdominal adhesions, active proctitis, psychological instability and anismus resistant to conventional treatment. Other relative contraindications for the use are; men presenting with symptomatic internal rectal prolapse (uncommon group of patients), morbid obesity (BMI>40 kg/m^2), high-grade endometriosis, previous pelvic radiotherapy and previous sigmoid peridiverticulitis.

Posterior mesh rectopexy

It may be performed either laparoscopically or by open surgery. The laparoscopic approach is the more frequently preferred one because of the established short-term advantages of laparoscopy. There are many variations of posterior rectopexy which are impossible to describe in this paper; the oldest [43] may be the Ripstein technique and the newest the laparoscopic posterior mesh rectopexy (modified Wells procedure) using various mesh materials. The main operative steps are the posterior mobilization of the rectum from the sacrum down to the pelvic floor and the division of the lateral ligaments of the rectum. The mesh is fixated on the lateral rectum and sacrum.

The posterior laparoscopic mesh rectopexy [44] is a safe technique with functional postoperative outcomes similar of the laparoscopic ventral mesh rectopexy but its opponents claim that it may worsen constipation in many cases. The procedure is well tolerated in older patients [45] with acceptable recurrence and morbidity rates. A high incontinence score [46] and age older than 70 yrs., are predictor factors for a poor continence state after surgery.

In patients with severe constipation the laparoscopic ventral mesh rectopexy is probably a more suitable technique than posterior mesh rectopexy. Other studies [47] do not show significant differences between the two procedures; anterior and posterior mesh rectopexy with acceptable post-operative complications of grade II Clavien-Dindo score at a low level of 3% for both procedures.

Orr-loygue rectopexy

The procedure is an alternative to lateral rectal rectopexy on sacrum and two nylon strips attach the lateral rectal sides onto promontory. The lateral ligaments of the rectum are preserved [48] in order to avoid ne novo constipation after surgery. The mobilization of rectum is relatively limited. The procedure may be performed in external rectal prolapse and in other conditions such as in internal prolapse with fecal incontinence and outlet obstruction. In the previous study the preservation of the lateral ligaments did not

present an increased recurrence rate after surgery.

Posterior suture rectopexy: The use of mesh or other prosthetic materials has been challenged by some- are they truly necessary? In fact, there are even some authors that have claimed that thorough mobilization of the rectum [49] without any additional procedure results in enough fibrosis to cause a "rectopexy effect" without a "pexy" procedure. The "mobilization-only" approach appears to have a somewheat higher recurrence rate but some surgeons and patients might prefer that compared to an even small risk of mesh-related complications.

The performance of a suture rectopexy [50] has been shown to be adequate treatment for external rectal prolapse.

Tack rectopexy: This is a more modern variation of the suture rectopexy [51] where instead of sutures the fixation of the rectum on the sacrum is done via laparoscopic "tacks". The procedure appears to be safe and technically straight forward but wider experience and longer follow up reports are required.

Stapled resection of rectal prolapse: Stapled resections of rectal mucosa have been mainly used for haemorrhoid treatment. However the scope of stapling [52-55] moved soon to include small partial thickness rectal prolapse and, finally, reports of application of stapling of external full-thickness rectal prolapse, emerged. More than one stapling devices and stapler sizes have been used in several modifications.

The stapled procedure is relatively quick and straight forward technically with minimal postoperative pain. There is an acceptable rate of complications and recurrences but there are no comparative studies to date to allow drawing definitive conclusions. The size of prolapse treatable by stapling is restricted by the size of the staples and therefore the method would only be suitable for small size external prolapses. The cost of the staplers has to be considered, particularly if several gun firings are required.

Frykman-Goldberg resection rectopexy: The procedure [56] consists of sigmoid colectomy and concurrent fixation of the rectum on the sacrum without the use of mesh (although a variation with mesh has also been described). The anastomosis is high, i.e. located in the major pelvis above the promontory.

Patients with external rectal prolapse are benefit when exists preoperative constipation, improving constipation after surgery [57] and the outcomes are better than mesh rectopexy alone would be performed, indeed selected patients with redundant left colon and constipation are benefit from the operation; in a rare group of young age patients with external rectal prolapse [58] the resection-rectopexy procedure was the most popular operation in 48% of patients.

The procedure has low recurrence and complications rates <5% and mortality rates at 1%. The more dreaded complication is anastomotic leak and this risk should be included in the informed consent process.

Perineal Procedures

Delorme operation: It is an operation suitable for older patients with comorbidities and short length external rectal prolapse less than 5 cm. It may be performed without general anesthesia. The procedure involves a mucosal sleeve resection of the prolapsed rectum and the muscular layer is plicated in the edges of dissected mucosa. Recurrence rates may be slightly higher than in abdominal procedures at the level of 10-15% but other studies [59] report similar recurrence and functional outcomes compared with perineal rectosigmoidectomy and abdominal procedures.

Perineal rectosigmoidectomy (Altemeier procedure): The procedure [60] is performed for full thickness rectal prolapse in patients unsuitable for abdominal surgery, with an external prolapse longer than 5 cm from the dentate line.

The procedure transects the prolapsed rectum 1-2 cm above the dentate line and a coloanal anastomosis is performed (hand sewn or with circular stapler). During mobilisation the mesentery of the prolapsed bowel is serially ligated until no further redundant bowel can be pulled down. Before performing the anastomosis, some surgeons combine the resection with levatorplasty [61], which is thought to decrease the risk of recurrence through the prolapsing pelvic floor. The procedure is safe, with low morbidity rates and satisfactory functional outcomes. The recurrence rate varies in the literature ranging from 0 to 16%.

In a systematic review study for the efficacy of rectal suspension methods [62] in patients with constipation the anatomical correction was ranging between 80-100% among studies, the improvement for constipation and solitary rectal ulcer was 86% and 75% respectively. Morbidity rates were varying between 5-15%, without mortality and low complication rate at 0.5% with data on harms imprecise.

Conclusions

Surgery is the only treatment option in patients with external rectal prolapse. The best surgical operation cannot be identified; there are several groups of patients with various characteristics related to various symptoms and other anatomic and functional pelvic floor disorders that may coexist with external prolapse and eventual should be treated at the same time with the external rectal prolapse.

The variety of procedures available and the absence of a "gold standard procedure" make the choice awkward for the inexperienced surgeon. An additional difficulty is that in today's medicolegal world it is a complex task to explain to the patient all the available operation options and the pros and cons of each one.

The "surgeon factor" should be considered. If two procedures are equally suitable for a patient's needs, then the surgeon would and should choose the procedure with which he/she is more familiar and technically proficient. There is no point to attempt a laparoscopic sutured rectopexy if the surgeon is not proficient in laparoscopic-or robotic-suturing.

The "patient factor" is more complex. The recommendation should always be individualized but some generalizations are useful to make a start of the discussion:

a) A patient with cardiorespiratory comorbidities should be advised to have a perineal procedure so as to avoid the potential impact of a pneumoperitoneum or a laparotomy

b) A patient with severe constipation and a redundant sigmoid colon should be advised that a posterior rectopexy is more likely to aggravate the constipation. Even the verntral rectopexy may result in angulation of the suspended redundant sigmoid, therefore the advantage of a concurrent sigmoid colon resection should be considered-albeit with analysis of the risks of anastomotic leak.

c) A female patient with concurrent prolapse of the middle and anterior compartment and/or enterocele may benefit by concurrent sacrocolpopexy, however this is not the remit of a colorectal surgeon and the preoperative input of a Urogynaecologist and the pelvic floor MDT is mandatory.

d) A patient with external prolapse and faecal incontinence should be warned that the incontinence may not improve after the repair of the prolapse, as it is often the result of pudendal neuropathy. A rectopexy has a "constipating" effect that may improve the faecal incontinence, although the effect may not be permanent.

e) Co-existence of slow transit constipation and/or pelvic floor dyssynergia: the patient should be warned that treatment of the external prolapse will leave symptoms of those conditions and that in the absence of appropriate medical management the recurrence of the prolapse is possible. The patient should receive postoperative treatment with medication, biofeedback and pelvic floor physiotyherapy.

There are many other possible clinical scenarios and it is the surgeon's duty to hold a thorough and honest discussion with the patient that will provide all the necessary information which is necessary in order to consider the informed consent process as standard.

Particular attention should be paid to the risk of mesh complications. The use of a titanium-coated or a biologic mesh limits risk of that complication to around 1% but in the event it occurs then the consequences are so grave that anything bar full disclosure preoperatively will be criticized.

Overall surgery for external full-thickness rectal prolapse is a treatment of a problem of quality of life. It therefore requires the appropriate respect to the patient's individual circumstances and requirements so as to justify the surgical intervention.

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