



Review Article

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Internal Rectal Prolapse: A Step-by-Step Approach to Assessment and Conservative or Surgical Therapy: A Review of the Literature

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Abstract

Background: Internal rectal prolapse is a rare pelvic floor disorder. Many anatomic and functional pelvic floor disorders may coexist. The assessment of this condition by a multidisciplinary team for pelvic floor disorders and further conservative measures are effective in most patients. Refractory symptoms may be treated by surgery.

Material and Methods: A review of the literature based on Google Scholar and PubMed medical databases was performed. Parameters related to internal rectal prolapse as clinical ones, the associated functional and anatomical pelvic floor disorders coexisting with the internal rectal prolapse, the necessary preoperative examinations, and the final conservative or surgical treatment are reviewed. Cross-references of the published articles were used to accomplish this review study.

Results: Physical examination of the perineum, patients' symptoms, history, the severity of symptoms, and many investigations need for the correct assessment of this condition; defecography, pelvic MRI, MR defecography, endorectal ultrasounds, anorectal manometry and electromyography of the pelvic floor muscles are the most common investigations. Most patients respond to conservative treatment. Refractory cases are treated by surgery; abdominal rectopexy procedures and perineal excisional mucosal techniques are the most common in use.

Conclusions: Conservative treatment is effective in 70-80% of patients when patients are diagnosed and treated by a multidisciplinary team for pelvic floor disorders. The effectiveness of surgery is in 60-90% of patients without guidelines for the selection of patients and the most suitable surgical technique. Surgery (anatomical correction) does not treat severe functional disorders. The most common operation is the laparoscopic ventral mesh rectopexy. In selected patients, STARR procedure and Delorme operation may be performed. Conservative and surgical treatment remains individualized based on the patient's characteristics.

Keywords: Internal rectal prolapse, Symptoms, Conservative, Surgery, Complications, Outcomes, Recurrences.

Introduction

Internal rectal prolapse (rectal intussusception or occult rectal prolapse) is a condition of invagination of the rectum into itself; it is a completely different entity from the external rectal prolapse, where in the last condition surgery is the only treatment option. The exact relationship between internal and external rectal prolapse remains quite obscure; studies in the natural history of internal rectal prolapse [1] reveal that internal rectal prolapse may

be a preceding condition to external rectal prolapse with a strong relationship between age and grade of the internal prolapse. Other clinical studies [2,3] in patients with internal rectal prolapse, show a small possibility for the appearance of external rectal prolapse and this possibility varies in low levels from 3.8-6.7%. This small percentage does not justify surgery as a first treatment option in patients with internal rectal prolapse.



Internal rectal prolapse may be asymptomatic, it is a common condition in both asymptomatic and symptomatic patients; studies in defecography [4] based on healthy young volunteers reveal the presence of the rectal intussusception and other conditions such as rectocele, disturbances in anorectal angle and pelvic floor descending in many patients without symptoms and maybe with other factors to have implications in further clinical symptoms. In symptomatic patients with functional bowel disorders and internal rectal prolapse [5], it seems that defecography presents more advanced findings than in asymptomatic individuals; a full-thickness intussusception is common, while a mucosal prolapse characterizes the asymptomatic individuals. On the other hand, advanced grades of internal rectal prolapse may be asymptomatic without any need for further therapy.

Many clinical symptoms may be improved by conservative measures, refractory symptoms and failure of conservative treatment implies the participation of surgery as a treatment option; many surgical operations are in use without clear guidelines for the best surgical treatment and timing of surgery.

In this review study, we try to clarify the clinical aspect of this uncommon condition, and the usefulness of imaging data in diagnosis, as this condition may be difficult to diagnose. Indeed, we try to clarify the present position of surgery in the treatment of internal rectal prolapse.

Epidemiology and Incidence of the Internal Rectal Prolapse

The etiology of this condition as in the case of the external rectal prolapse remains unclear and many pelvic anatomic and functional bowel disorders may coexist. The incidence of external rectal prolapse, which is a clear surgical disease, is clearer [6] accounting for 2.5/100.000 population.

Studies in the natural history of internal rectal prolapse show in some parameters similarities with external rectal prolapse; the presence of this condition increases with age and is more common in females. The real incidence of internal rectal prolapse in the large spectrum of rectal prolapse disease remains unidentified in the literature. This condition may be considered [7] as a primary anatomic rectal disorder or it is a secondary condition that coexists with other functional bowel disorders and raises two questions.

Firstly, which is the clinical importance of this condition? Despite the common presence of this condition in defecography studies, individuals may be asymptomatic, indeed a high grade of internal prolapse many times does not present clinical symptoms and individuals may remain asymptomatic. In symptomatic patients is difficult to connect the existence of bowel functional disorders with internal rectal prolapse as an etiologic factor, despite the presence of the internal rectal prolapse, as they may be of multifactorial origin; in fecal incontinence, a common symptom of internal rectal prolapse [8], the mechanical effect of prolapsed tissue in anorectal sphincter system and rectal sensory mechanisms could explain

the incontinence after a long-standing time of an advanced grade of internal prolapse, but in defecography investigations [9] for fecal incontinence, rectal intussusception is detected in only 10% of patients. The incidence of internal rectal prolapse in obstructed defecation symptom, another common symptom of this condition remains unclear.

Secondly, which is the implication of surgery for internal rectal prolapse in the spectrum of rectal prolapse disease? Internal rectal prolapse is a chronic condition; many symptoms are improved by conservative measures and patients with refractory symptoms are candidates for surgery. There are reports [10], where last year's epidemiological trends in surgery for rectal prolapse are characterized by the increase in the number of operations for rectal prolapse disease, where predominate minimally non-invasive techniques such as laparoscopic ventral mesh repair, a procedure suitable for external and internal rectal prolapse. In the last study, with more than 25.000 operations for rectal prolapse, the number of patients with internal rectal prolapse could not be identified. The implication of surgery for internal rectal prolapse remains unclear in the spectrum of rectal prolapse disease.

Clinical Symptoms of the Internal Rectal Prolapse

Internal rectal prolapse is considered a pelvic floor disorder. Symptoms are complex and diagnosis may be difficult. More common symptoms [11] are evacuation disorders in 85% of patients and fecal continence disorders in 56%. Complex anatomic (rectal intussusception, enterocele, rectocele, descending perineum) and functional disorders (pelvic dyssynergia, loss of the recto anal inhibitory reflex) may lead to evacuation disorders.

The most common symptom is obstructed defecation often observed in internal rectal prolapse and rectocele. It is a complex disorder [12] with the impaired promotion of stool through the rectum and anus and one of the major subtypes of functional constipation; patients may present with abdominal discomfort and pain mainly when coexists enterocele, incomplete evacuation and sensation of rectal obstruction, hard stools exit, vaginal, rectal, or perineal digitation to achieve more complete evacuation, reduced stool frequency and straining in the toilet. An intense feeling of rectal obstruction when coexists pelvic dyssynergia (anismus) and in this type of constipation with normal colonic transit [13], biofeedback is an essential therapy. The term obstructed defecation is probably misleading as in most cases there is no apparent anorectal obstruction; this term in the new Rome IV criteria [14] for gastrointestinal functional disorders is not in use and many symptoms of obstructed defecation are included in functional bowel constipation disorders but the term of pelvic dyssynergia is still in use as a cause of constipation.

In patients with internal rectal prolapse, obstructed defecation, and rectocele [15], patients benefit from bowel retraining and medical agents, a mandatory option therapy before surgery. The benefit

of pelvic floor retraining in patients with a high-grade internal prolapse (presenting as obstructed defecation or incontinence) [16] may be not satisfactory and patients are more closed to surgery. Finally, the treatment of obstructed defecation syndrome remains in 80% of patient's conservative [17], by suitable fiber diet, laxatives, rectal irrigation, pelvic floor retraining, and psychotherapy as a psychosomatic component of obstructed defecation exists in 2/3 of patients. A minority is a candidate for surgery of the numerous surgical procedures available. A multidisciplinary approach to the treatment of obstructed defecation seems to offer the best results.

Fecal incontinence is another common symptom of internal rectal prolapse; high grades of internal rectal prolapse are connected [18] with increased rates of fecal incontinence rather than constipation disorders.

Rectocele is a common condition in most patients with internal rectal prolapse (80%) and seems to be the result of anatomical or functional pelvic floor disorders than the causative factor of the internal rectal prolapse. The presence of descending perineum is a disappointing condition as conservative and surgical outcomes are poor. Another symptom, the lower rectal/pelvic pain may be caused by the presence of a solitary rectal ulcer, a condition found in internal rectal prolapse or animus.

Associated Conditions and Risk Factors in Patients with Internal Rectal Prolapse

The female gender, advanced age, multiparity, connective tissue disorders, rectocele, enterocele, descent perineum, animus, straining in the toilet, constipation, chronic coughing, vaginal or rectal digitation, many toilet visits, feeling of incomplete evacuation, solitary rectal ulcer, and special psychosomatic status.

Classification Systems for Internal Rectal Prolapse

There are many systems for classification of the internal rectal prolapse; to date, the most common in use is the Oxford radiological rectal prolapse grading system in proctographic, where the internal rectal prolapse is classified in four grades: the first two grades (I and II) are recto-rectal intussusception (high and low rectal respectively) and the last two grades (III and IV) are recto-anal intussusception (high and low anal respectively).

Clinical and Physical Examination

A complete history of symptoms and detection of associated conditions and risk factors should be available. The main symptoms raise suspicion for internal rectal prolapse and guide further diagnostic procedures as many times the diagnosis is difficult, especially in the first grades of internal prolapse. The anal sphincter tone should be estimated by finger examination. Proctoscopy and endoscopy should exclude other benign or malignant anorectal conditions. During proctoscopy anterior anorectal wall is inspected for edema, erythema, ulcerations, or solitary rectal ulcer.

Uro-gynecologic examination and assessment of anterior, middle, and posterior pelvic compartments are recommended in preoperative work-up. The presence of a rectocele increases the suspicion of internal rectal prolapse. Even though the diagnosis may be performed during clinical examination the most difficult step is to clarify the real origin of the main symptoms that implies further investigations. The severity of the main symptoms should be registered using standardized scores in patients with fecal incontinence and constipation, such as the Fecal Incontinence Score Index [19] and the Wexner score [20], or other severity indexes from the numerous existing in literature; as the first treatment is the conservative, this assessment is beneficial and comparable with the scores after therapy. Mixt symptoms [21] such as fecal incontinence and constipation are not excluded. A multidisciplinary approach [22] for the assessment of functional disorders is preferable, offering the initial conservative measures such as dietary, biofeedback for constipation and fecal incontinence, psychotherapy, and other available therapies.

Useful Investigations in Internal Rectal Prolapse

Fluoroscopic (Conventional) Defecography

It is the gold standard examination in patients with defecation disorders with radiologic images obtained in rest, evacuation, and recovery phases. Various conditions may be detected. In a large study [23] in patients with defecation disorders rectal intussusception was detected in 31%, rectocele in 27%, enterocele in 19%, and rectal prolapse in 13%, with rectoceles more common in patients with abnormal descending perineum than in patients with normal descending perineum. Internal rectal prolapse can be graded according to Oxford radiologic system in four grades.

MRI of the Pelvic Floor and MR Defecography

MRI and Dynamic MRI allow for the assessment [24] of anatomic and functional disorders in the anterior, middle, and posterior perineal compartments at the same time. In posterior compartment is useful in many anatomic disorders such as obstructed defecation syndrome, rectal descending, rectal invagination, rectocele, and enterocele, and indeed in some functional disorders such as dyssynergia defecation. The examination successfully defines the grade of the pelvic organ prolapse. Conventional defecography and dynamic MR defecography [25] are complementary imaging studies; the first has a higher accuracy for rectoceles and enteroceles and the last is superior to assessing symptoms of rectal prolapse from the posterior perineal compartment and identifies better the rectal intussusception.

Endorectal Ultrasounds

The examination may diagnose the intussusception as a double concentric ring, obviously found 5-7cm above the anal verge. The examination has limited use as the method is overlapped with defecography and Dynamic MRI defecography. It is a useful exami-

nation in patients with high-grade intussusception and a solitary rectal ulcer [26] detecting a thickened internal anal sphincter. It is a useful examination in patients with rectal prolapse and fecal incontinence; anal sphincter integrity is classified in four grades of severity [27] and may predict surgical outcomes after surgery; high grades of anal sphincter damage are a negative prognostic factor for improvement of incontinence after surgery. In patients with internal rectal prolapse and obstructed defecation syndrome, the benefit comes [28] studying the combined results of 3D-endorectal ultrasonography and high-resolution anorectal manometry; parameters such as rectal wall thickness, total rectal wall volume, pushing endo-rectal pressure and recto-anal gradient evacuation may be determined and understand better the anatomical or functional features of the internal rectal prolapse and rectal function. To date, 3D endo-rectal ultrasounds are considered due to simplicity the gold standard examination [29] on patients with fecal incontinence as successfully defines various damages in puborectalis, internal and external sphincter muscles.

Anorectal Manometry

A useful examination in internal rectal prolapse with obstructed defecation syndrome [30], there may exist three main abnormalities: a positive straining test, maximal voluntary contraction, and impaired rectal sensation. In patients with high grades of internal prolapse [31] a loss or impairment of recto-anal inhibitory reflex may be detected. Manometry according to findings [32] may define various types of dyssynergia. Manometry and MRI defecography may differentiate [33] the cause of obstructed defecation; pelvic dyssynergia or other structural pathologic disorders implicated in obstructed defecation syndrome. The increase in grades of internal rectal prolapse [34] is positively correlated with a reduction in internal anal sphincter tone.

Electromyography of the Pelvic Floor Muscles

It is an additional examination helpful in the diagnosis [35] of dyssynergia and obstructed defecation syndrome in patients with internal prolapse; in these conditions, the correct diagnosis many times is difficult and the differential diagnosis from other functional bowel disorders is based on the use of multiple diagnostic investigations such as MRI defecography, manometry, electromyography, proctoscopy, and the history of symptoms. In patients with obstructed defecation syndrome, the correlation of internal rectal prolapse with symptoms is unclear; multiple examinations, associated conditions (enterocele, rectocele), and conditions such as irritable bowel disease, dyssynergia and the severity of constipation should be correctly diagnosed [36], preferable in a pelvic floor disorders department, and initially treated conservatively and not by surgery.

Conservative Measures in internal Rectal Prolapse and Associated Conditions

Internal rectal prolapse and many associated conditions [37] such as obstructed defecation syndrome, rectocele, enterocele,

solitary rectal ulcer syndrome, animus, and psychosomatic disorders should be treated initially by conservative measures. The most common measures in obstructed defecation syndrome [38] are a fiber diet, increased fluid intake, and various types of laxatives and enemas without personal abuse in use to avoid anorectal trauma. Other available therapies are colonic hydrotherapy and rectal irrigations [39]. Behavioral changes in physical activity or bowel habits probably have a positive result in chronic constipated patients. Biofeedback may be performed in many conditions such as dyssynergia, rectal hyposensitivity, solitary rectal ulcer, and patients with constipation and fecal incontinence [40] but effectiveness is lower when conditions are long-standing. Biofeedback may improve puborectalis and external anal sphincter function but not the internal anal function [41] and the low anal resting tone. In patients with defecatory disorders [42], the effectiveness of biofeedback is at 60-70% and the results are evident after a few sessions of biofeedback.

Special consideration for conservative treatment needs patients with intussusception and incontinence; despite they may respond to biofeedback and other conservative measures, high grades of intussusception are closer to surgery as the mechanical effect of prolapsed tissue on the anorectal canal [43] may create permanent and irreversible neural and motor defects and many incontinent patients present anal sphincter defects [44], in such conditions, surgery does not exclude the conservative treatment postoperatively [45]; sacral neuromodulation (with implantation of a permanent pulse generator) offers the chance for improvement in fecal incontinence and quality of life. Rectocele is a common condition in patients with obstructed defecation syndrome and is mainly the result of obstructed defecation rather than the cause of constipation. Patients respond positively to pelvic floor retraining and surgery is the last measure, after the failure of conservative treatment in large-size symptomatic rectoceles trapping stool. The main symptoms are due to obstructive defecation [46] rather than the presence of a rectocele.

Solitary rectal ulcer syndrome [47] may be observed in internal rectal prolapse and other colorectal conditions; in patients with straining, pelvic floor muscles dyssynergia, and local trauma due to digitation. A pathology report offers the final diagnosis. In treatment, many conservative measures are recommended with an emphasis on biofeedback. Various surgical operations are available but after the failure of conservative treatment. Animus (pelvic dyssynergia) is the dys-synergy of pelvic floor muscles with failure to relax the puborectalis sling on straining, resulting in angulation of the rectum and inability to evacuate. The main treatment is physiotherapy -biofeedback. Botulinum toxin has a favorable and temporary effect and a new operation [48] of the bilateral partial division of puborectalis muscles is promising in the treatment of animus.

Enterocele is a condition where the small bowel descends into the pouch of Douglas; there is central pelvic-abdominal pain during defecation and a need for repair of the peritoneum above Douglas's pouch. An enterocele should be operated on when pain and pelvic heaviness are predominant symptoms and refractory to conser-

vative therapy. Patients with internal rectal prolapse and anxiety or depression should be having psychiatric support. Patients with internal rectal prolapse with various associated conditions benefit at maximum when are diagnosed correctly and treated by various available methods from a specialized multidisciplinary team for pelvic floor disorders. The lack of suitable conservative treatment has the risk of surgical over therapy without the maximum benefit; the correction of anatomical found disorders [49], many times does not improve functional existent disorders e.g., in the case of rectoceles. It seems that conservative treatment is the main treatment and only a minority of selected patients are candidates for surgery.

Surgery of the Internal Rectal Prolapse

Internal rectal prolapse is a condition of prolapse of the rectum, localized in the posterior compartment of the pelvic floor; various symptoms and other anatomical and functional anorectal disorders may coexist, and therapy is individualized. A significant difference from external rectal prolapse a condition where surgery is the only treatment option is that most patients with internal rectal prolapse with various defecatory disorders respond positively to conservative treatment in a high percentage more than 60-70%. Some coexisted conditions such as severe fecal incontinence, pelvic denervation, severe anal sphincter damage, and descending perineum may be more refractory in conservative and in surgical treatment.

Surgical treatment of internal rectal prolapse presents effectiveness in high percentages like those of conservative treatment or more. Many surgical procedures may be performed for the treatment of internal rectal prolapse; most reported studies present their results such as outcomes of surgery, recurrences, complications, and symptoms of patients, compare preoperative with postoperative outcomes but do not report if previously a conservative treatment was performed, on the other hand, if the availability of some conservative measures is limited, then surgery of internal rectal prolapse would be a treatment option that is addressed in symptomatic high grades of internal rectal prolapse. To date there are no guidelines for the best surgical technique and selection of patients; this is a crucial point and according to patients' characteristics and relevant investigations may be predicted the expectation of conservative or surgical treatment. Surgical procedures may be transabdominal or perineal. More common and popular in use are the following:

Laparoscopic Ventral Mesh Rectopexy (D'Hoore)

The procedure was proposed [50] by *D'Hoore, et al.*, in 2004. The procedure is well described [51] and was proposed for the surgical therapy of the external rectal prolapse, by the time indications were expanded for the treatment of internal rectal prolapse and it is also suitable to correct middle compartment prolapse by posterior colporrhaphy and Sacro-colpopexy. The procedure avoids the posterior mobilization of the rectum and protects autonomous nerves offering better postoperative functional outcomes. The procedure does not create postoperatively de novo constipation, but some parameters [52] during surgery, such as excessive rectal mobilization and the division of lateral ligaments may increase constipation. Va-

rious types of meshes may be used, mainly synthetic or biological but mesh-related complications [53] in rectal suspension and fixation are lower than those seen in transvaginal procedures and Uro gynecological procedures such as Sacro-colpopexy for pelvic organ prolapse. Mesh erosions of various types are seen mostly in synthetic meshes at 1.87% [54] than in biological meshes at 0.22%.

Biological meshes (expensive) may be safer but to date, there is no evidence for the use of this type of meshes. Recently [55] new types and cheaper synthetic meshes appear in the literature and their use should be evaluated in the future. Biological meshes have been used in internal rectal prolapse of grade III and IV, in patients with obstructed defecation or fecal incontinence [56] with complete cure rates for incontinence and constipation at 72% and 79% respectively and various complications are reported at 18% of patients.

The procedure may be performed robotic [57] without any significant differences between conventional laparoscopic ventral mesh rectopexy and robotic surgery, but some advantages in robotic surgery [58, 59] may place the procedure as the gold standard for the future. Fecal incontinence in patients with high-grade internal rectal prolapse presents an improvement in 70-90% of patients [60] with lower percentages at 60-70% in patients with obstructed defecation syndrome, a complex and multifactorial disorder. The procedure except defecatory disorders treats successfully [61] symptomatic rectoceles and enteroceles in a percentage higher than 50% of patients. In a systematic review and meta-analysis [62] for the surgery of the internal rectal prolapse, the weighted mean rates of improvement for obstructed defecation and fecal incontinence were 73.9% and 60.2% respectively with a mean complication rate of 15% and mean recurrence rate at 5.8%. Some proctographic findings as the vertical rectal axis and the presence of enterocele [63] predict the outcome of ventral mesh rectopexy; outcomes are better when previously reported factors exist.

The STARR Procedure for Obstructed Defecation Syndrome in Internal Rectal Prolapse

It is a stapled perineal resection of prolapsed tissue suitable in low locations of the internal rectal prolapse, the procedure does not treat prolapse above anorectal junction. The procedure was introduced in 2004 [64] as a safe and effective technique for internal rectal prolapse and rectoceles. It was a short-time operation, with a short time in hospital stay for most patients; many complications were reported such as 17.8 % fecal urgency, 8.9% incontinence to flatus, 5.5% urinary retention, 4.4 % bleeding, and 3.3% anastomotic stenosis. All constipation symptoms were significantly improved without a worsening of the anal continence. Four years later in 2008 [65], the procedure was evaluated by the Italian Society of Colorectal Surgeons; improvement in obstructed defecation syndrome by 65% and a high reoperation rate is reported. The procedure probably is not suitable in many conditions such as large rectoceles, enteroceles, digitation, sense of incomplete evacuation, and more advanced pelvic floor disease. Many patients with dyssynergia or low bowel frequency may present worsening symptoms postope-

ratively. Many complications are described and the most common postoperative problems are the perianal pain, the recurrences of the prolapse and rectoceles, and the incontinence in a high percentage of patients. The procedure is indicated only in well-selected patients.

At the same period, in another study [66], severe postoperative complications are described with difficult management; the method is contraindicated in enteroceles, dyssynergia, and probably in patients with decreased anal function. Other studies propose [67] neuromodulation if fecal incontinence appears after surgery. A common postoperative problem of fecal urgency seems to improve over time. In long-term outcomes [68]; recurrences of obstructed defecation symptoms at 40% of patients in 10 yrs. (with risk factors for recurrence of the previous anorectal and pelvic Uro gynecological surgery), persistent perianal pain at 38%, and urgent defecation at 22%. The procedure is less effective in long-term outcomes. In a systematic review [69] evaluating rectal excisional techniques in patients with constipation; complications occur in 13–22%, postoperative bleeding in 1–3%, serious complications are very rare; 1:1,000, rectal stenosis at 1 year <1:1,000, the urgency of defecation in 10%, longer-term pain < 2%, recto-vaginal fistula 1:1,600 and zero deaths.

The Delorme Procedure in Internal Rectal Prolapse

The Delorme procedure is a perineal operation for external rectal prolapse in selected elderly patients with comorbidities. A modified procedure for the anterior Delorme operation is suitable for patients with internal rectal prolapse. Both procedures, the standard and anterior Delorme may be used in the surgical therapy of internal rectal prolapse. Many symptoms may improve [70], and the patient's satisfaction is more than 75% with poor outcomes in 23.6% of patients. Other studies [71] report symptomatic improvement at 85.7%, minor complications, and short postoperative incontinence in many patients for 2-3 months. Complications [72] are at 10.2% such as fissure-in-ano, proctalgia, and suture-line dehiscence with stenosis.

The procedure is suitable for symptomatic patients [73] with refractory symptoms in conservative treatment. Postoperative results are better when postoperative biofeedback is performed. The disadvantages of the procedure include a high morbidity index of up to 35% with rare severe complications, high recurrences, and postoperative continence problems. Mucosal resection techniques may be the preferable procedure after the failure of conservative treatment in patients with at least three symptoms of obstructed defecation syndrome.

Conclusions

Internal rectal prolapse is a pelvic floor disorder and many associated anatomical or functional disorders may coexist such as rectocele, enterocele, descending perineum, solitary rectal ulcer, pelvic dyssynergia, pelvic organ prolapse, and psychosomatic disorders. The main symptoms are evacuator disorders and incontinence in more than 50% of patients and this condition may be asymptomatic. The diagnosis may be difficult, and a crucial step

is to differentiate the origin of the main symptom; many patients need multiple investigations such as defecography, pelvic MRI and MR defecography, endorectal ultrasounds, anorectal manometry, and electromyography of the pelvic muscles. First-line treatment is the conservative treatment; more than 60-70% of patients respond positively to various conservative measures and patients benefit in maximum by a multidisciplinary team for pelvic floor disorders. Patients with refractory symptoms are candidates for surgery, to date there are no guidelines for the best surgical procedure. Surgery is effective in 70-80% of patients as the anatomical correction of this condition does not resolve severe functional disorders. The most common and popular operation to date is the laparoscopic ventral mesh rectopexy with effectiveness in more than 70% of patients with incontinence or obstructed defecation syndrome. In selected patients, pelvic mucosal excisional techniques, stapled or Delorme mucosectomy may be performed.

References

1. Wijffels NA, Collinson R, Cunningham C, Lindsey I (2010) What is the natural history of internal rectal prolapse. *Colorectal Dis* 12(8): 822-830.
2. Mellgren A, Schultz I, Johansson C, Dolk A (1997) Internal rectal intussusception seldom develops into total rectal prolapse. *Dis Colon Rectum* 40(7): 817-820.
3. Choi JS, Hwang YH, Salum MR, Weiss EG, Pikarsky AJ, et al. (2001) Outcome and management of patients with large rectoanal intussusception. *Am J Gastroenterol* 96(3): 740-744.
4. Shorvon PJ, McHugh S, Diamant NE, Somers S, Stevenson GW (1989) Defecography in normal volunteers: results and implications. *Gut* 30(12): 1737-1749.
5. Dvorkin LS, Gladman MA, Epstein J, Scott SM, Williams NS, et al. (2005) Rectal intussusception in symptomatic patients is different from that in asymptomatic volunteers. *Br J Surg* 92(7): 866-872.
6. Kairaluoma MV, Kellokumpu IH (2005) Epidemiologic aspects of complete rectal prolapse. *Scand J Surg* 94(4): 207-210.
7. Weiss EG, McLemore EC (2008) Functional disorders: rectoanal intussusception. *Clin Colon Rectal Surg* 21(2):122-8.
8. Karlbom U, Graf W, Nilsson S, Pahlman L (2004) The accuracy of clinical examination in the diagnosis of rectal intussusception. *Dis Colon Rectum* 47(9): 1533-1538.
9. Hwang YH, Person B, Choi JS, et al. (2006) Biofeedback therapy for rectal intussusception. *Tech Coloproctol* 10(1): 11-16.
10. El Dhuwaib Y, Pandyan A, Knowles CH (2020) Epidemiological trends in surgery for rectal prolapse in England 2001-2012: an adult hospital population-based study. *Colorectal Dis* 22(10): 1359-1366.
11. de Vergie L C, Venara A, Duchalais E, Frampas E, Lehur PA (2017) Internal rectal prolapse: definition, assessment, and management in 2016. *J visc surg* 154(1): 21-28.
12. Fabrizio AC, Alimi Y, Kumar AS (2017) Methods of evaluation of anorectal causes of obstructed defecation. *Clin Colon Rectal Surg* 30(1): 46-56.
13. Chiarioni G, Whitehead WE, Pezza V, Morelli A, Bassotti G (2006) Biofeedback Is Superior to Laxatives for Normal Transit Constipation Due to Pelvic Floor Dyssynergia. *J Gastroenterol* 130(3): 657-664.
14. Schmulson MJ, Drossman DA (2017) What Is New in Rome IV. *J Neurogastroenterol Motil* 23(2): 151-163.
15. Hicks CW, Weinstein M, Wakamatsu M, Savitt L, Pulliam S, et al. (2014) In patients with rectoceles and obstructed defecation syndrome, surgery should be the option of last resort. *Surgery* 155(4): 659-667.

16. Adusumilli S, Gosselink MP, Fourie S, Curran K, Jones OM, et al. (2013) Does the presence of a high grade internal rectal prolapse affect the outcome of pelvic floor retraining in patients with faecal incontinence or obstructed defaecation. *Colorectal Dis* 15(11): e680-e685.
17. Podzemny V, Pescatori LC, Pescatori M (2015) Management of obstructed defecation. *World J Gastroenterol* 21(4): 1053- 1060.
18. Hawkins AT, Olariu AG, Savitt LR, Gingipally S, Wakamatsu MM, et al. (2016) Impact of Rising Grades of Internal Rectal Intussusception on Fecal Continence and Symptoms of Constipation. *Dis Colon Rectum* 59(1): 54-61.
19. Rockwood TH, Church JM, Fleshman JW, Kane RL, Mavrantonis C, et al. (1999) Patient and surgeon ranking of the severity of symptoms associated with fecal incontinence: the fecal incontinence severity index. *Dis Colon Rectum* 42(12): 1525-1532.
20. Agachan F, Chen T, Pfeifer J, Reissman P, Wexner SD (1996) A constipation scoring system to simplify evaluation and management of constipated patients. *Dis Colon Rectum* 39(6): 681-685.
21. Vollebregt PF, Wiklendt L, Dinning PG, Knowles CH, Scott SM (2020) Coexistent faecal incontinence, and constipation: A cross-sectional study of 4027 adults undergoing specialist assessment. *E Clinical Medicine* 27: 100572.
22. Basnayake C, Kamm MA, Stanley ARN, Wilson O'Brien A, Burrell KR, Lees Trinca I, et al. (2020) Standard gastroenterologist versus multidisciplinary treatment for functional gastrointestinal disorders (MANTRA): an open-label, single-centre, randomised controlled trial. *Lancet Gastroenterol Hepatol* 5(10): 890-899.
23. Mellgren A, Bremner S, Johansson C, Dolk A, Udén R, et al. (1994) Defecography. *Dis Colon Rectum* 37(11): 1133-1141.
24. Maccioni F (2018-2021) Diseases of the Abdomen and Pelvis 2018-2021. 13-20.
25. Van Iersel JJ, Formijne Jonkers HA, Verheijen PM, Broeders IAMJ, Heggelman BGF, et al. (2017) Comparison of dynamic magnetic resonance defaecography with rectal contrast and conventional defaecography for posterior pelvic floor compartment prolapse. *Colorectal Dis* 19(1): 046-053.
26. Marshall M, Halligan S, Fotheringham T, Bartram C, Nicholls RJ (2002) Predictive value of internal anal sphincter thickness for diagnosis of rectal intussusception in patients with solitary rectal ulcer syndrome. *Br J Surg* 89(10): 1281-1285.
27. Emile SH, Youssef M, Thabet W, Omar W, Khafagy W, et al. (2020) Role of Endoanal Ultrasonography in Grading Anal Sphincter Integrity in Rectal Prolapse and in Predicting Improvement in the Continence State After Surgical Treatment. *Surg Laparosc Endosc Percutan Tech* 30(1): 62-68.
28. Bruscianno L, Tolone S, Limongelli P, Del Genio G, Messina F, et al. (2018) Anatomical and Functional Features of the Internal Rectal Prolapse with Outlet Obstruction Determined With 3D Endorectal Ultrasonography and High-Resolution Anorectal Manometry: An Observational Case-Control Study. *Am J Gastroenterol* 113(8): 1247-1250.
29. Bliss DJ, Mimura T, Berghmans B, Bharucha A, Chiarioni G, Emmanuel A, et al. (2017) Assessment and conservative management of faecal incontinence and quality of life in adults.
30. Pucciani F, Ringressi MN (2012) Obstructed defecation: the role of anorectal manometry. *Tech Coloproctol* 16(1): 67-72.
31. Park BS, Cho SH, Son GM, Kim HS, Cho YH, et al. (2021) Absent or impaired rectoanal inhibitory reflex as a diagnostic factor for high-grade (grade III-V) rectal prolapse: a retrospective study. *BMC Gastroenterol* 21(1): 157.
32. Rao SS (2008) Dyssynergic Defecation and Biofeedback Therapy. *Gastroenterol Clin N Am* 37(3): 569-586.
33. Heinrich H, Sauter M, Fox M, Weishaupt D, Halama M, Misselwitz B, et al. (2015) Assessment of Obstructive Defecation by High-Resolution Anorectal Manometry Compared With Magnetic Resonance Defecography. *Clin Gastroenterol Hepatol* 13(7): 1310-1317.
34. Harmston C, Jones OM, Cunningham C, Lindsey I (2011) The relationship between internal rectal prolapse and internal anal sphincter function. *Colorectal Disease* 13(7): 791-795.
35. Gottesman L (2019) Internal Rectal Prolapse, Anismus, and Obstructed Defecation Reconsidered. *Dis Colon Rectum* 62(6): e33-e34.
36. Cavallaro P, Kyle S, Lieba S, Holly M, Kevin K, et al. (2019) The Contributions of Internal Intussusception, Irritable Bowel Syndrome, and Pelvic Floor Dyssynergia to Obstructed Defecation Syndrome. *Dis Colon Rectum* 62(1): 56-62.
37. Richelle JF, Felt Bersma E, Tiersma SM, Cuesta MA (2008) Rectal Prolapse, Rectal Intussusception, Rectocele, Solitary Rectal Ulcer Syndrome, and Enterocele. *Gastroenterol Clin N Am* 37(3): 645-668.
38. Bove A, Bellini M, Battaglia E, Bocchini R, Gambaccini D, et al. (2012) Consensus statement AIGO/SICCR diagnosis and treatment of chronic constipation and obstructed defecation (part II: treatment). *World J Gastroenterol* 18(36): 4994-5013.
39. Chan DS, Saklani A, Shah PR, Lewis M, Haray PN (2012) Rectal irrigation: a useful tool in the armamentarium for functional bowel disorders. *Colorectal Dis* 14(6): 748-752.
40. YH Hwang YH, Person B, Choi JS, Nam YS, Singh JJ, et al. (2006) Biofeedback therapy for rectal intussusception. *Tech Coloproctol* 10(1): 11-16.
41. Hämäläinen KP, Raivio P, Antila S, Palmu A, Mecklin JP (1996) Biofeedback therapy in rectal prolapse patients. *Dis Colon Rectum* 39(3): 262-265.
42. Jodorkovsky D, Dunbar KB, Gearhart SL, Stein EM, Clarke JO (2013) Biofeedback Therapy for Defecatory Dysfunction: "Real Life" Experience. *Journal of Clinical Gastroenterology* 47(3): 252-255.
43. Kraemer M, Paulus W, Kara D, Mankewitz S, Rozsnoki S (2016) Rectal prolapse traumatizes rectal neuromuscular microstructure explaining persistent rectal dysfunction. *Int J Colorectal Dis* 31(12): 1855-1861.
44. Siproudhis L, Eléouet M, Rousselle A, El Alaoui M, Ropert A, et al. (2008) Overt Rectal Prolapse and Fecal Incontinence. *Dis Colon Rectum* 51(9): 1356-1360.
45. Mishra A, Prapasrivorakul S, Gosselink M P, Gorissen K J, Hompes R, et al. (2016) Sacral neuromodulation for persistent faecal incontinence after laparoscopic ventral rectopexy for high-grade internal rectal prolapse. *Colorectal Dis* 18(3): 273-278.
46. Piccirillo MF, Teoh TA, Yoon KS, Patiño Paul RA, Lucas J, et al. (1996) Rectoceles : the incidence and clinical significance. *Tech Coloproctol* 2: 75-79.
47. Forootan M, Darvishi M (2018) Solitary rectal ulcer syndrome: A systematic review. *Medicine (Baltimore)* 97(18): e0565.
48. Farid M, Youssef T, Mahdy, Omar W, Moneim HA, et al. (2009) Comparative study between botulinum toxin injection and partial division of puborectalis for treating anismus. *Int J Colorectal Dis* 24(3): 327-334.
49. Vermeulen J, Lange JF, Sikken AC, van der Harst E (2005) Anterolateral rectopexy for correction of rectoceles leads to good anatomical but poor functional results. *Tech Coloproctol* 9(1): 35-41.
50. D Hoore A, Cadoni R, Penninckx F (2004) Long-term outcome of laparoscopic ventral rectopexy for total rectal prolapse. *Br J Surg* 91(11): 1500-1505.

51. D Hoore A, Penninckx F (2006) Laparoscopic ventral recto(colpo)pexy for rectal prolapse: surgical technique and outcome for 109 patients. *Surg Endosc* 20(12): 1919-1923.
52. Mollen RMHG, Kuijpers JHC, van Hoek F (2000) Effects of rectal mobilization and lateral ligaments division on colonic and anorectal function. *Dis Colon Rectum* 43(9): 1283-1287.
53. Mercer Jones MA, Brown SR, Knowles CH, Williams AB (2020) Position statement by the Pelvic Floor Society on behalf of the Association of Coloproctology of Great Britain and Ireland on the use of mesh in ventral mesh rectopexy. *Colorectal Dis* 22(10): 1429-1435.
54. Balla A, Quaresima S, Smolarek S, Shalaby M, Missori G, et al. (2017) Synthetic versus biological mesh-related erosion after laparoscopic ventral mesh rectopexy: a systematic review. *Ann Coloproctol* 33(2): 46-51.
55. Alemrajabi M, Darabi B, Banivaheb B, Hemmati N, Jahanian S, et al. (2021) Polyvinylidene fluoride mesh use in laparoscopic ventral mesh rectopexy in patients with obstructive defecation syndrome for the first time. *J Invest Surg* 34(10): 1083-1088.
56. Franceschilli L, Varvaras D, Capuano I, Ciangola CI, Giorgi F, et al. (2015) Laparoscopic ventral rectopexy using biologic mesh for the treatment of obstructed defaecation syndrome and/or faecal incontinence in patients with internal rectal prolapse: a critical appraisal of the first 100 cases. *Tech Coloproctol* 19(4): 209-219.
57. J. Mäkelä Kaikkonen J, Rautio T, Pääkkö E, Biancari F, Ohtonen P, et al. (2016) Robot-assisted vs laparoscopic ventral rectopexy for external or internal rectal prolapse and enterocele: a randomized controlled trial. *Colorectal Dis* 18(10): 1010-1015.
58. Faucheron JL, Trilling B, Girard E (2019) Robotic ventral mesh rectopexy for rectal prolapse: a few years until this becomes the gold standard. *Tech Coloproctol* 23(5): 407-409.
59. Bao X, Wang H, Song W, Chen Y, Luo Y (2021) Meta-analysis on current status, efficacy, and safety of laparoscopic and robotic ventral mesh rectopexy for rectal prolapse treatment: can robotic surgery become the gold standard?. *Int J Colorectal Dis* 36(8): 1685-1694.
60. D Hoore A (2022) Effectiveness of laparoscopic ventral mesh rectopexy in adults with internal rectal prolapse and defecatory disorders. *Tech Coloproctol* 26(12): 927-928.
61. Formijne Jonkers HA, Poierré N, Draaisma WA, Broeders IAMJ, Consten ECJ (2013) Laparoscopic ventral rectopexy for rectal prolapse and symptomatic rectocele: an analysis of 245 consecutive patients. *Colorectal Dis* 15(6): 695-699.
62. SH Emile SH, Elfeki HA, Youssef M, Farid M, Wexner SD (2017) Abdominal rectopexy for the treatment of internal rectal prolapse: a systematic review and meta-analysis. *Colorectal Dis* 19(1): 013-024.
63. Ris F, Gorissen KJ, Ragg J, Gosselink MP, Buchs NC, et al. (2017) Rectal axis and enterocele on proctogram may predict laparoscopic ventral mesh rectopexy outcomes for rectal intussusception. *Tech Coloproctol* 21(8): 627-632.
64. Boccasanta P, Venturi M, Stuto A, Bottini C, Caviglia A, et al. (2004) Stapled transanal rectal resection for outlet obstruction: a prospective, multicenter trial. *Dis Colon Rectum* 47(8): 1285-1296.
65. Gagliardi G, Pescatori M, Altomare DF, Binda GA, Bottini C, et al. (2008) Results, outcome predictors, and complications after stapled transanal rectal resection for obstructed defecation. *Dis Colon Rectum* 51(2): 186-195.
66. Pescatori M, Gagliardi G (2008) Postoperative complications after procedure for prolapsed hemorrhoids (PPH) and stapled transanal rectal resection (STARR) procedures. *Tech Coloproctol* 12(1): 7-19.
67. Wolff K, Marti L, Beutner U, Steffen T, Lange J, et al. (2010) Functional outcome and quality of life after stapled transanal rectal resection for obstructed defecation syndrome. *Dis Colon Rectum* 53(6): 881-888.
68. Schiano di Visconte M, Nicolì F, Pasquali A, Bellio G (2018) Clinical outcomes of stapled transanal rectal resection for obstructed defaecation syndrome at 10-year follow-up. *Colorectal Dis* 20(7): 614-622.
69. Mercer Jones M, Grossi U, Pares D, Vollebregt PF, Mason J, et al. (2017) Surgery for constipation: systematic review and practice recommendations. Results III: Rectal wall excisional procedures (Rectal Excision). *Colorectal Dis* 19(S3): 49-72.
70. Liberman H, Hughes C, Dippolito A (2000) Evaluation and outcome of the delorme procedure in the treatment of rectal outlet obstruction. *Dis Colon Rectum* 43(2): 188-192.
71. Anthony Dippolito A, Esser S, Reed J (2005) Anterior Modification of Delorme Procedure Provides Equivalent Results to Delorme Procedure in Treatment of Rectal Outlet Obstruction. *J Curr Surg* 62(6): 609-612.
72. Ganio E, Martina S, Novelli E, Sandru R, Glerico G, et al. (2013) Internal Delorme's procedure for rectal outlet obstruction. *Colorectal Dis* 15 (3): e144-e150.
73. Leo CA, Campenni P, Hodgkinson JD, Rossitti P, Digito, et al. (2018) Long-Term Functional Outcome after Internal Delorme's Procedure for Obstructed Defecation Syndrome, and the Role of Postoperative Rehabilitation. *J Invest Surg* 31(3): 256-262.