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Surgical Treatment of Rectal Prolapse (History of the Issue and Modern Perspective — Literature Review)

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Aim: to assess the data on the most common surgical interventions for rectal prolapse.
Key points. At present, there are more than 100 methods of surgical correction of rectal prolapse that are carried out by means of the perineal or abdominal approach. Perineal surgical approaches are mostly performed in elderly patients who suffer from severe concomitant diseases, as well as in cases of recurrent rectal prolapse. In other cases, the abdominal approach is preferred for surgical interventions. Currently, the most popular surgery is laparoscopic recto(colpo)sacropexy.
Conclusion. It is important to consider that the descending perineum syndrome is accompanied by a variety of clinical symptoms; therefore, patients with rectal prolapse require a personalized approach. Underestimation of these factors may lead to an unfavorable outcome of functional treatment and recurrence of rectal prolapse.
Keywords: rectal prolapse, pelvic prolapse, pelvic floor prolapse syndrome
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Хирургическое лечение выпадения прямой кишки (история вопроса и современный взгляд)

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Цель обзора: проанализировать данные по наиболее распространенным хирургическим вмешательствам по поводу выпадения прямой кишки.
Основные положения. В настоящее время существует более 100 способов хирургической коррекции выпадения прямой кишки, которые выполняются с использованием промежностного либо трансабдоминального доступа. Операции промежностным доступом чаще всего применяются у пациентов старшей возрастной группы с тяжелыми сопутствующими заболеваниями, а также при рецидиве выпадения прямой кишки. В остальных случаях преимущественным является трансабдоминальный доступ хирургических вмешательств. В настоящее время наиболее популярной операцией является лапароскопическая ректо(кольпо)-сакропексия.
Заключение. Важно учитывать, что синдром опущения промежности сопровождается разнообразной клинической симптоматикой, в связи с этим пациенты с выпадением прямой кишки требуют индивидуального подхода. Недооценка указанных обстоятельств может привести к неблагоприятному функциональному результату лечения и рецидиву выпадения прямой кишки.
Ключевые слова: выпадение прямой кишки, тазовый пролапс, синдром опущения тазового дна
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Introduction

The rectal prolapse is the most demonstrative manifestation of the descending perineum syndrome, when the muscular-ligamentous structures lose their ability to support the rectum within the pelvic cavity.

Alan Parks, who proposed the definition of descending perineum syndrome in 1966, exemplified it by the rectal prolapse, emphasizing that it is the weakening of the pelvic floor muscles that leads to displacement of the rectal wall into the anal canal, followed by its prolapse beyond the anus. Thus, he complemented the existing, mutually non-exclusive, hernia and invagination theories of bowel prolapse and added the missing link to the sequential chain of rectal prolapse development, which now follows a logical progression: formation of a deep Douglas pouch due to weakness of the pelvic floor muscles (hernia theory) — displacement of the pelvic peritoneum and the rectal wall in a distal direction under the influence of factors that increase intra-abdominal pressure (invagination theory) — a complete prolapse of the rectal walls due to decompensation of the fixing apparatus.

This condition is accompanied by severe discomfort, which significantly impairs the quality of life and leads to social maladjustment.

Surgical treatment

The history of rectal prolapse treatment dates back to the time before the modern era. Mentions of this ailment have been found in the Ebers papyri created in 1500 BC [1].

In the 19th century, numerous devices such as tarpaulin and adhesive dressings, special bandages, pelottes, gutta-percha balloons, rubber balls, and other devices to hold the rectum in place were proposed [2–4].

With the advent of antiseptic and anesthetic practices, surgical methods began to be introduced, involving the fixation or resection of the prolapsed bowel. To date, there are more than 100 methods of surgical correction, which are carried out by means of the perineal or abdominal approach. Among the perineal approaches, the most popular are the Mikulicz, Altemeier, and Delorme surgeries.

Perineal resection of the prolapsed rectal segment was first performed by J. Mikulicz in 1889 and has since become widely used both in the author's native land and abroad [5–7]. However, in a short time, reports emerged of complications associated with the surgery, such as bleeding and anastomotic leakage, as well as related mortality rates reaching 11 % [8]. Additionally, an analysis of treatment outcomes conducted at St. Mark's Hospital (London) revealed that the recurrence rate of prolapse and anal sphincter insufficiency after the Mikulicz surgery reached 58 and 76 %, respectively, which led surgeons to abandon this method for an extended period [9].

In 1952, W.A. Altemeier modified the Mikulicz surgery by supplementing perineal resection of the prolapsed rectum with pelvic floor muscle repair. The author reported a recurrence of rectal prolapse in only 3 out of 106 patients operated on using his technique [10]. Other researchers who applied the Altemeier surgery in their practice noted a recurrence rate ranging from 0 to 44 % [11, 12]. In addition, in 12 % of cases the development of complications, such as bleeding, anastomotic leakage, pararectal abscess, and rectal stricture, was noted [11].

With the advent of stapling devices, some surgeons began forming anastomoses using mechanical sutures, noting their greater reliability compared to handmade sutures [13–15].

The Delorme surgery, proposed in 1900, is considered to be a less invasive method for treating rectal prolapse [16]. This method is applied in cases of prolapse of the mucosa or a short full-wall segment of the rectum, as well as rectal prolapse complicated by a solitary ulcer [17].

The essence of the surgery involves excising the mucous membrane of the prolapsed portion of the rectum, followed by plication of the muscle layer to form a ridge located at the proximal edge of the anal canal [16]. Some authors report that after the Delorme surgery, there is a significant increase in resting pressure and voluntary contraction pressure of anal sphincters [17, 18]. Based on the reference literature, 50 % of patients who previously had suffered from constipation experienced improved colon function after the Delorme surgery, with no newly developed constipation reported [19, 20]. According to other sources, constipation, along with inflammatory complications in the surgical area, urinary retention and bleeding from the suture line, occur in the postoperative period in 4–12 % of cases [21, 22]. Mortality following the Delorme surgery ranges from 0 to 4 %, while the recurrence rate varies from 4 to 38 % [17, 18, 21–23].

The above methods of rectal prolapse treatment are mainly applied in elderly patients and those who suffer from severe concomitant diseases, for whom abdominal surgeries are contraindicated [24–28].

The abdominal approach is mainly used for fixation surgeries involving prosthetic materials.

In 1952, an American surgeon C.B. Ripstein first implemented a technique, in which rectopexy was performed using a Teflon mesh placed anterior to the rectum in the form of a loop, with the free edges fixed to the sacrum. To prevent stricture, the mesh is attached in such a way that a free space remains between the posterior rectal wall and the sacrum [29]. According to the literature, the recurrence rate of rectal prolapse after the Ripstein surgery ranges from 0 to 13 %; however, symptoms of impaired rectal evacuation function are common [30–34]. An improvement in anal continence following anterior loop rectopexy is observed in 20–60 % of patients, while improved rectal evacuation is reported in 32 %; on the other hand, constipation progression occurs in 48 % of patients [35].

It should be noted that fixation of the rectum to the sacrum using a mesh placed in the anterior position does not eliminate the risk of stricture development, which may require recurrent surgery in 17 % of cases [36–39].

To eliminate the shortcomings of the Ripstein surgery and achieve better outcomes in treating rectal prolapse, another fixation method was proposed by E.H. Wells in 1959. He used a rectangular implant made of Ivalon sponge, which was transversely attached to the sacral promontory with non-absorbable sutures. After mobilizing and pulling up the rectum, the edges of the implant were sutured to the lateral semicircles of the rectum [40].

After assessing the results of posterior loop rectopexy, authors report rectal prolapse recurrence rates ranging from 3 to 15 % [40–44]. An improvement in anal continence during the postoperative period occurs in 3 to 40 % of patients [30, 43, 45–47]. Data on the development of constipation after the Wells surgery are inconsistent, but some reports indicate rates reaching 75 % [47, 48].

Over time, synthetic meshes have been used instead of Ivalon sponge for posterior loop rectopexy, and more recently, biological implants have been introduced. Studies comparing the results of using materials with different structures have not shown significant differences; however, the use of biological implants, which are structurally similar to natural body tissues, is generally considered preferable by authors [30, 31, 48–51].

In some patients, fixation is combined with resection of the elongated sigmoid colon. This method of treating rectal prolapse was first described by H.M. Frykman in 1955 [52]. Time has shown that this type of surgery does not significantly affect the frequency of disease recurrence. However, some researchers report that patients who underwent sigmoid colon resection along with rectopexy experienced postoperative constipation much less frequently [48, 53–55].

Anterior rectal resection proposed as a treatment method for rectal prolapse also did not lead to a significant improvement in outcomes [56]. The experience of treating 113 patients who underwent anterior rectal resection for prolapse was summarized at the Mayo Clinic. Recurrence of prolapse was reported in 9 % of cases. Additionally, an increase in recurrence rates was noted over time, with frequencies of 3 %, 6 %, and 12 % at 2, 5, and 10 years of follow-up, respectively. Postoperative complications, including anastomotic leakage in 3 patients, were identified in 29 % of cases [57]. According to other sources, a recurrence of prolapse occurred in 7 % of patients during follow-up periods of up to 6 years after the surgery [58]. An unfavorable aspect of anterior resection in patients with incontinence, often associated with rectal prolapse, is the possibility of complete loss of bowel control, which may develop after the formation of a low anastomosis [58, 59].

Therefore, despite a wide variety of surgical methods for treating rectal prolapse, there is still no procedure capable of guaranteeing consistent results, just as there is no sufficient convincing research proving the superiority and reliability of any particular method. This is likely due to the relative rarity of the disease. According to a survey of 50 % of the members of the Association of Coloproctology of Great Britain and Ireland (ACPGBI), each surgeon performs an average of 6 surgeries for rectal prolapse per year [60]. Most of the published data on treatment outcomes are based on a small number of observations and, therefore, lack reliability. To obtain more accurate data, sample sizes were increased through multicenter studies. One of these studies, involving 643 patients treated at 15 centers, was conducted in the USA [61]. This study examined recurrence rates following the use of various techniques, approaches and fixation methods for rectal prolapse. The results showed no significant differences in recurrence rates between the methods studied. However, an increase in recurrences was observed across all groups as the follow-up period lengthened. While the recurrence rate did not exceed 3 % within a year after surgery, regardless of the method used, it varied from 15 to 30 % after 10 years [61].

Later, the largest multicenter study in Europe under the auspices of the Association of Coloproctology of Great Britain and Ireland was conducted — the PROSPER (Prolapse Surgery Perineal or Rectopexy) study [60]. It included 293 patients treated at 34 centers located not only in the United Kingdom but also abroad. Randomization was performed between the abdominal and perineal approaches, resectional and suture rectopexy, and among patients operated on

by the perineal approach, between the Altemeier and Delorme surgeries. The results of the study showed a relatively high frequency of recurrences ranging from 6 weeks to 3 years post-surgery, with no significant differences between patient groups. At the same time, consistent improvement in bowel function and anal continence was noted across all groups. Thus, this study also failed to demonstrate a clear advantage of any particular method for correcting rectal prolapse.

And yet, during the 10 years over which this largest study was conducted, approaches to the treatment of rectal prolapse have changed significantly. According to a survey of members of the Association of Coloproctology of Great Britain and Ireland, the frequency of abdominal surgeries has significantly increased, while the number of resection rectopexy cases has dramatically decreased, while the posterior loop rectopexy is now performed half as often. The ventral rectopexy proposed by A. D'Hoore et al. in 2004 has become the most popular abdominal method [62]. In 97 % of cases, the surgery is performed laparoscopically or using robotic techniques [63].

Despite the lack of convincing evidence demonstrating this method's advantage over others, surgeons increasingly prefer it due to such features as limited mobilization of the rectum only along the anterior and right semicircle while preserving the lateral ligaments, significantly reducing the risk of postoperative constipation, the ability to use this surgery to correct associated manifestations of pelvic floor descent syndrome, such as rectocele or enterocele, as well as a relatively low number of recurrences reported by proponents of this method. According to a meta-analysis of twelve non-randomized studies involving 728 patients, recurrences of rectal prolapse after ventral recto(colpo)sacropexy were noted in 3.4 % of cases, while postoperative complications occurred in 23 % of cases [64]. The complications include mesh protrusion into the vagina or rectum, rectal stricture, formation of a rectovaginal fistula [65, 66]. As a consequence of laparoscopic fixation surgeries, port-associated hernia and a rarer complication, lumbosacral discitis, may also occur [67, 68]. According to a multicenter study involving 508 patients, a positive functional outcome was noted by 86 % of patients with complete prolapse in the long-term postoperative period [69].

A rather difficult and unresolved issue remains the correction of anal incontinence, which is observed in 11–81 % of patients with rectal prolapse [12, 70–72]. Weakness of the anal sphincter in these patients is caused not only by the mechanical stretching of the prolapsed rectum but also by pelvic neuropathy, which often develops on the background of pelvic floor descent syndrome [71, 73, 74]. Sphincter insufficiency can also be exacerbated by an increase in the anorectal angle observed in patients with long-standing symptoms of pelvic floor descent [75–77].

According to the literature, effectively eliminating rectal prolapse significantly improves anal continence in almost half of the patients. For example, P.T. Aitola et al. (1999) found that 40 % of patients experienced improved anal continence following posterior loop rectopexy [78]. Meanwhile, A. D'Hoore et al. (2004) reported significant functional improvement in 29 out of 31 patients with signs of anal incontinence after undergoing ventral rectopexy for rectal prolapse [62].

Conclusion

Rectal prolapse, as one of the manifestations of descending perineum syndrome, most often occurs on the background of a long-term developing failure of the muscular-ligamentous apparatus of the pelvic floor. Due to pronounced structural changes in the tissues and the loss of their functional properties, fixation surgeries using prosthetic materials are pathogenetically justified for this category of patients. Currently, the most common method is laparoscopic recto(colpo)sacropexy, which allows achieving acceptable anatomical and functional treatment outcomes. In elderly patients with severe concomitant diseases posing a high risk for endotracheal anesthesia, perineal methods of treatment are recommended. Additionally, surgeries by the perineal approach are justified in cases of recurrent rectal prolapse and for young patients to avoid complications associated with sexual dysfunction.

It is important to consider that the descending perineum syndrome is accompanied by a wide variety of clinical symptoms caused by associated functional and psycho-emotional disorders. These features require a personalized approach with preliminary correction of identified disorders. Underestimation of these factors may lead to an unfavorable functional treatment outcome and recurrence of the rectal prolapse.

References / Литература

1. *Mann C.V.* Rectal prolapse. In: Morson B.S. *Diseases of the colon, rectum and anus.* New York: Appleton-Century-Crofts, 1969:238–50.
2. *Ежов К.А.* Бандаж для лечения полного выпадения прямой кишки у детей. *Русская медицина.* 1893;46:760. [*Ezhov K.A.* Bandage for treatment of complete prolapse of rectum in children. *Russian Medicine.* 1893;46:760. (In Russ.)].
3. *Карпинский И.Г.* Руководство к изучению и лечению болезней прямой кишки и заднего прохода. СПб., 1870:338. [*Karpinsky I.G.* A guide to the study and treatment of diseases of the rectum and anus. Saint Petersburg, 1870:338. (In Russ.)].
4. *Basevi S.* Contribution to the therapy of prolapsus recti in children. Wien: Med. Press, 1878:153–1155.
5. *Gabriel W.B.* The principles and practice of rectal surgery. London: HK Lewis, 1945.
6. *Mikulicz J.* For the surgical treatment of prolapsus recti et coli invaginati. *Arch F Kiln Chir.* 1889;38:74–97.
7. *Miles W.E.* Recto-sigmoidectomy as a method of treatment for procidentia recti. *Proc R Soc Med.* 1933;26(11):1445–8. DOI: 10.1177/003591573302601106
8. *Даниель-Бек К.В.* Выпадение прямой кишки и его лечение. М.: Медгиз, 1958. [*Daniel-Beck K.V.* Prolapse of the rectum and its treatment. Moscow: Medgiz, 1958. (In Russ.)].
9. *Ripstein C.B., Lanter B.* Etiology and surgical therapy of massive prolapse of the rectum. *Ann Surg.* 1963;157(2):259–64. DOI: 10.1097/00000658-196302000-00012
10. *Altemeier W.A., Culbertson W.R., Schowengerdt C., Hunt J.* Nineteen years' experience with the one-stage perineal repair of rectal prolapse. *Ann Surg.* 1971;173(6):993–1006. DOI: 10.1097/00000658-197106010-00018
11. *Gregorcyk S.G.* Perineal proctosigmoidectomy: The procedure of choice for rectal prolapsed. *Clin Colon Rectal Surg.* 2003;16(4):263–9. DOI: 10.1055/s-2004-815619
12. *Madiba T.E., Baig M.K., Wexner S.D.* Surgical management of rectal prolapse. *Arch Surg.* 2005;140(1):63–73. DOI: 10.1001/archsurg.140.1.63
13. *Hida J., Yasutomi M., Maruyama T., Nakajima A., Uchida T., Wakano T., et al.* Coloanal anastomosis using a circular stapling device following perineal rectosigmoidectomy for rectal prolapse. *Surg Today.* 1999;29(1):93–4. DOI: 10.1007/BF02482980
14. *Schwandner O.* Conversion in transanal stapling techniques for haemorrhoids and anorectal prolapse. *Colorectal Dis.* 2011;13(1):87–93. DOI: 10.1111/j.1463-1318.2009.02062.x
15. *Vermeulen F.D., Nivatvongs S., Fang D.T., Balcos E.G., Goldberg S.M.* A technique for perineal rectosigmoidectomy using autosuture devices. *Surg Gynecol Obstet.* 1983;156(1):84–6.
16. *Delorme E.* On the treatment of large rectal prolapses by excision of the rectal or rectocolic mucosa. *Bull Acad Med.* 1900:526–39.
17. *Pescatori M., Boffi F., Russo A., Zbar A.P.* Complications and recurrence after excision of rectal internal mucosal prolapse for obstructed defaecation. *Int J Colorectal Dis.* 2006;21(2):160–5. DOI: 10.1007/s00384-005-0758-x
18. *Tsunoda A., Yasuda N., Yokoyama N., Kamiyama G., Kusano M.* Delorme's procedure for rectal prolapse: Clinical and physiological analysis. *Dis Colon Rectum.* 2003;46(9):1260–5. DOI: 10.1007/s10350-004-6724-9
19. *Poole G.V. Jr., Pennell T.C., Myers R.T., Hightower F.* Modified Thiersch operation for rectal prolapse. Technique and results. *Am Surg.* 1985;51(4):226–9.
20. *Sileri P., Franceschilli L., de Luca E., Lazzaro S., Angelucci G.P., Fiaschetti V., et al.* Laparoscopic ventral rectopexy for internal rectal prolapse using biological mesh: Postoperative and short-term functional results. *J Gastrointest Surg.* 2012;16(3):622–8. DOI: 10.1007/s11605-011-1793-2
21. *Lieberth M., Kondylis L.A., Reilly J.C., Kondylis P.D.* The Delorme repair for full-thickness rectal prolapse: A retrospective review. *Am J Surg.* 2009;197(3):418–23. DOI: 10.1016/j.amjsurg.2008.11.012
22. *Watkins B.P., Landercasper J., Belzer G.E., Rechner P., Knudson R., Bintz M., et al.* Long-term follow-up of the modified Delorme procedure for rectal prolapse. *Arch Surg.* 2003;138(5):498–502. DOI: 10.1001/archsurg.138.5.498
23. *van Geluwe B., Wolthuis A., Penninckx F., D'Hoore A.* Lessons learned after more than 400 laparoscopic ventral rectopexies. *Acta Chir Belg.* 2013;113(2):103–6.
24. *Воробьев Г.И.* Основы колопроктологии. М.: МИА, 2006:193–208. [*Vorobyev G.I.* Fundamentals of coloproctology. Moscow: MIA Publ., 2006:193–208. (In Russ.)].
25. *Attaluri A., Donahoe R., Valestin J., Brown K., Rao S.S.* Randomised clinical trial: Dried plums (prunes) vs. psyllium for constipation. *Aliment Pharmacol Ther.* 2011;33(7):822–8. DOI: 10.1111/j.1365-2036.2011.04594.x
26. *Soare C., Lasithiotakis K., Dearden H., Singh S., McNaught C.* The surgical management of rectal prolapse. *Indian J Surg.* 2021;83:694–700. DOI: 10.1007/s12262-019-02058-0
27. *Mazzocconi G., Zechini F., Nigita G., Anselmi D., Terenzi A., Rossi Lemeni A., et al.* Surgical treatment of total rectal prolapse: Delorme's technique. *G Chir.* 2000;21(5):248–52.
28. *O'Brien D.P.* 4th. Rectal prolapse. *Clin Colon Rectal Surg.* 2007;20(2):125–32. DOI: 10.1055/s-2007-977491
29. *Ripstein C.B.* Procidentia: Definitive corrective surgery. *Dis Colon Rectum.* 1972;15(5):334–6. DOI: 10.1007/BF02587406
30. *Hoel A.T., Skarstein A., Ovrebo K.K.* Prolapse of the rectum, long-term results of surgical treatment. *Int J Colorectal Dis.* 2009;24(2):201–7. DOI: 10.1007/s00384-008-0581-2
31. *Athanasiadis S., Weyand G., Heiligers J., Heumuller L., Barthelmes L.* The risk of infection of three synthetic materials used in rectopexy with or without colonic resection for rectal prolapse. *Int J Colorectal Dis.* 1996;11(1):42–4. DOI: 10.1007/BF00418855
32. *Raftopoulos Y., Senagore A.J., Di Giuro G., Bergamaschi R.; Rectal Prolapse Recurrence Study Group.* Recurrence rates after abdominal surgery for complete rectal prolapse: A multicenter pooled analysis of 643 individual patient data. *Dis Colon Rectum.* 2005;48(6):1200–6. DOI: 10.1007/s10350-004-0948-6
33. *Schütz G.* Extracorporal resection of the rectum in the treatment of complete rectal prolapse using a circular stapling device. *Dig Surg.* 2001;18(4):274–7. DOI: 10.1159/000050150
34. *Tjandra J.J., Fazio V.W., Church J.M., Milsom J.W., Oakley J.R., Lavery I.C.* Ripstein procedure is an effective treatment for rectal prolapse without constipation. *Dis Colon Rectum.* 1993;36(5):501–7. DOI: 10.1007/BF02050018
35. *Fleshman J.W., Kodner I.J., Fry R.D.* Internal intussusception of the rectum: A changing perspective. *Neth J. Surg.* 1989;41(6):145–8.
36. *Lalwani N., El Sayed R.F., Kamath A., Lewis S., Arif H., Chernyak V.* Imaging and clinical assessment of functional defecatory disorders with emphasis on defecography. *Abdom Radiol (NY).* 2021;46(4):1323–33. DOI: 10.1007/s00261-019-02142-9
37. *Gordon P.H., Hoexter B.* Complications of the Ripstein procedure. *Dis Colon Rectum.* 1978;21(4):277–80. DOI: 10.1007/BF02586703
38. *Keighley M.R., Fielding J.W., Alexander-Williams J.* Results of Marlex mesh abdominal rectopexy for rectal prolapse in 100 consecutive patients. *Br J Surg.* 1983;70(4):229–32. DOI: 10.1002/bjs.1800700415
39. *Roberts I.* Note on a method, probably new, of operating for complete prolapse of the rectum. *Ann Surg.* 1890;11:255–7.
40. *Cerdán Santacruz C., Gancedo Quintana Á., Cerdán Miguel J.* Delorme's procedure for rectal prolapse. *Dis Colon Rectum.* 2022;65(10):e956–7. DOI: 10.1097/DCR.0000000000002482
41. *Graf W., Karlbom U., Påhlman L., Nilsson S., Ejerblad S.* Functional results after abdominal suture recto-

pexy for rectal prolapse or intussusception. *Eur J Surg*. 1996;162(11):905–11.
42. *Khanna A.K., Misra M.K., Kumar K.* Simplified sutured sacral rectopexy for complete rectal prolapse in adults. *Eur J Surg*. 1996;162(2):143–6.
43. *Mann C.V., Hoffman C.* Complete rectal prolapse: The anatomical and functional results of treatment by an extended abdominal rectopexy. *Br J Surg*. 1988;75(1):34–7. DOI: 10.1002/bjs.1800750113
44. *Novell J.R., Osborne M.J., Winslet M.C., Lewis A.A.* Prospective randomized trial of Ivalon sponge versus sutured rectopexy for full-thickness rectal prolapse. *Br J Surg*. 1994;81(6):904–6. DOI: 10.1002/bjs.1800810638
45. *Benoist S., Taffinder N., Gould S., Chang A., Darzi A.* Functional results two years after laparoscopic rectopexy. *Am J Surg*. 2001;182(2):168–73. DOI: 10.1016/s0002-9610(01)00672-9
46. *Mollen R.M., Kuijpers J.H., van Hoek F.* Effects of rectal mobilization and lateral ligaments division on colonic and anorectal function. *Dis Colon Rectum*. 2000;43(9):1283–7. DOI: 10.1007/BF02237437
47. *Scaglia M., Fasth S., Hallgren T., Nordgren S., Oresland T., Hultén L.* Abdominal rectopexy for rectal prolapse. Influence of surgical technique on functional outcome. *Dis Colon Rectum*. 1994;37(8):805–13. DOI: 10.1007/BF02050146
48. *Luukkonen P., Mikkonen U., Järvinen H.* Abdominal rectopexy with sigmoidectomy vs. rectopexy alone for rectal prolapse: A prospective, randomized study. *Int J Colorectal Dis*. 1992;7(4):219–22. DOI: 10.1007/BF00341225
49. *Galili Y., Rabau M.* Comparison of polyglycolic acid and polypropylene mesh for rectopexy in the treatment of rectal prolapse. *Eur J Surg*. 1997;163(6):445–8.
50. *Gourgiotis S., Baratsis S.* Rectal prolapse. *Int J Colorectal Dis*. 2007;22(3):231–43. DOI: 10.1007/s00384-006-0198-2
51. *Xynos E.* Functional results after surgery for obstructed defecation. *Acta Chir Iugosl*. 2012;59(2):25–9. DOI: 10.2298/aci1202025x
52. *Frykman H.M.* Abdominal proctopexy and primary sigmoid resection for rectal procidentia. *Am J Surg*. 1955;90(5):780–9. DOI: 10.1016/0002-9610(55)90700-5
53. *Jacobs L.K., Lin Y.J., Orkin B.A.* The best operation for rectal prolapse. *Surg Clin North Am*. 1997;77(1):49–70. DOI: 10.1016/s0039-6109(05)70532-6
54. *McKee R.F., Lauder J.C., Poon F.W., Aitchison M.A., Finlay I.G.* A prospective randomized study of abdominal rectopexy with and without sigmoidectomy in rectal prolapse. *Surg Gynecol Obstet*. 1992;174(2):145–8.
55. *Solla J.A., Rothenberger D.A., Goldberg S.M.* Colonic resection in the treatment of complete rectal prolapse. *Neth J Surg*. 1989;41(6):132–5.
56. *Muir E.G.* Rectal prolapse. *Proc R Soc Med*. 1955;48(1):33–44. DOI: 10.1177/003591575504800113
57. *Schultz I., Mellgren A., Dolk A., Johansson C., Holmström B.* Long-term results and functional outcome after Ripstein rectopexy. *Dis Colon Rectum*. 2000;43(1):35–43. DOI: 10.1007/BF02237241
58. *Cirocco W.C., Brown A.C.* Anterior resection for the treatment of rectal prolapse: A 20-year experience. *Am Surg*. 1993;59(4):265–9.
59. *Hull T.L.* Rectal prolapse: Abdominal approach. *Clin Colon Rectal Surg*. 2003;16(4):259–62.
60. *Senapati A., Gray R.G., Middleton L.J., Harding J., Hills R.K., Armitage N.C., et al.; PROSPER Collaborative Group.* PROSPER: A randomised comparison of surgical treatments for rectal prolapse. *Colorectal Dis*. 2013;15(7):858–68. DOI: 10.1111/codi.12177
61. *Raftopoulos Y., Senagore A.J., Di Giuro G., Bergamaschi R.; Rectal Prolapse Recurrence Study Group.* Recurrence rates after abdominal surgery for complete rectal prolapse: A multicenter pooled analysis of 643 individual patient data. *Dis Colon Rectum*. 2005;48(6):1200–6. DOI: 10.1007/s10350-004-0948-6
62. *D'Hoore A., Cadoni R., Penninckx F.* Long-term outcome of laparoscopic ventral rectopexy for total rectal prolapse. *Br J Surg*. 2004;91(11):1500–5. DOI: 10.1002/bjs.4779
63. *Gunner C.K., Senapati A., Northover J.M., Brown S.R.* Life after PROSPER. What do people do for external rectal prolapse? *Colorectal Dis*. 2016;18(8):811–4. DOI: 10.1111/codi.13255
64. *Sayfan J., Pinho M., Alexander-Williams J., Keighley M.R.* Sutured posterior abdominal rectopexy with sigmoidectomy compared with Marlex rectopexy for rectal prolapse. *Br J Surg*. 1990;77(2):143–5. DOI: 10.1002/bjs.1800770209
65. *Mathew M.J., Parmar A.K., Reddy P.K.* Mesh erosion after laparoscopic posterior rectopexy: A rare complication. *J Minim Access Surg*. 2014;10(1):40–1. DOI: 10.4103/0972-9941.124473
66. *Tranchart H., Valverde A., Goasguen N., Gravié J.F., Mosnier H.* Conservative treatment of intrarectal mesh migration after ventral laparoscopic rectopexy for rectal prolapse. *Int J Colorectal Dis*. 2013;28(11):1563–6. DOI: 10.1007/s00384-013-1740-7
67. *Lammers K., Lince S.L., Spath M.A., van Kempen L.C., Hendriks J.C., Vierhout M.E., et al.* Pelvic organ prolapse and collagen-associated disorders. *Int Urogynecol J*. 2012;23(3):313–9. DOI: 10.1007/s00192-011-1532-y
68. *Vujovic Z., Cuarana E., Campbell K.L., Valentine N., Koch S., Ziyaie D.* Lumbosacral discitis following laparoscopic ventral mesh rectopexy: A rare but potentially serious complication. *Tech Coloproctol*. 2015;19(4):263–5. DOI: 10.1007/s10151-015-1279-4
69. *Mäkelä-Kaikkonen J., Rautio T., Ohinmaa A., Koivurova S., Ohtonen P., Sintonen H., et al.* Cost-analysis and quality of life after laparoscopic and robotic ventral mesh rectopexy for posterior compartment prolapse: A randomized trial. *Tech Coloproctol*. 2019;23(5):461–70. DOI: 10.1007/s10151-019-01991-2
70. *Friedman R., Muggia-Sulam M., Freund H.R.* Experience with the one-stage perineal repair of rectal prolapse. *Dis Colon Rectum*. 1983;26(12):789–91. DOI: 10.1007/BF02554750
71. *Madoff R.D., Williams J.G., Wong W.D., Rothenberger D.A., Goldberg S.M.* Long-term functional results of colon resection and rectopexy for overt rectal prolapse. *Am J Gastroenterol*. 1992;87(1):101–4.
72. *Snooks S.J., Henry M.M., Swash M.* Anorectal incontinence and rectal prolapse: Differential assessment of the innervation to puborectalis and external anal sphincter muscles. *Gut*. 1985;26(5):470–6. DOI: 10.1136/gut.26.5.470
73. *Penfold J.C., Hawley P.R.* Experiences of Ivalon-sponge implant for complete rectal prolapse at St. Mark's Hospital, 1960-70. *Br J Surg*. 1972;59(11):846–8. DOI: 10.1002/bjs.1800591103
74. *O'Brien C.P.* Pelvic floor and sphincter neuropathy after childbirth. *Pelvic floor, perineal, and anal sphincter trauma during childbirth: Diagnosis, management and prevention.* Cham: Springer International Publishing, 2024:293–316.
75. *Bouret J.M., De Meeus J.B., Kalfon A., Cancel J.* Associated rectal and genital prolapse: Value of Delorme's operation. A case report. *Rev Fr Gynecol Obstet*. 1992;87(4):231–7.
76. *Launer D.P., Fazio V.W., Weakley F.L., Turnhull R.B. Jr., Jagelman D.G., Lavery I.C.* The Ripstein procedure: A 16-year experience. *Dis Colon Rectum*. 1982;25(1):41–5. DOI: 10.1007/BF02553547
77. *McCue J.L., Thomson J.P.* Clinical and functional results of abdominal rectopexy for complete rectal prolapse. *Br J Surg*. 1991;78(8):921–3. DOI: 10.1002/bjs.1800780808
78. *Aitola P.T., Hiltunen K.M., Matikainen M.J.* Functional results of operative treatment of rectal prolapse over an 11-year period: Emphasis on transabdominal approach. *Dis Colon Rectum*. 1999;42(5):655–60. DOI: 10.1007/BF02234145

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