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Laparoscopic Posterior Mesh Rectopexy Vs Laparoscopic Suture Rectopexy for Complete Rectal Prolapse: A Randomized Controlled Trial

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ABSTRACT

Background: Complete rectal prolapse refers to the full-thickness extension of the rectal wall through the anus and is more prevalent in older adults, particularly women. Treatment primarily includes surgical correction, and there is still a discussion regarding the most effective one. **Objective:** This paper compares two laparoscopic methods, including laparoscopic posterior mesh rectopexy (LPMR) and laparoscopic posterior suture rectopexy (LPSR), in terms of recurrence rates and bowel functioning outcomes. **Study Design:** Randomized controlled trial. **Settings:** Department of Surgery, Khyber Teaching Hospital, Peshawar Pakistan. **Duration:** Two years from December 2023 to November 2025. **Methods:** A total of seventy-seven patients were selected who had complete rectal prolapse at random to receive either LPMR or LPSR. Outcomes were recurrence, postoperative constipation scores, and fecal incontinence severity index (FISI) at 30 and 60 days in the postoperative period. **Results:** Both groups were demographically similar. The LPMR group had significantly lower recurrence rates ($p = 0.004$), shorter operative time ($p < 0.001$), and improved bowel function, demonstrated by lower constipation ($p < 0.001$) and FISI scores ($p = 0.001$). No significant differences were observed in postoperative pain, hospital stay, or intraoperative blood loss. **Conclusion:** LPMR appears to offer superior outcomes over LPSR in reducing prolapse recurrence and improving bowel function. Long-term follow-up is recommended to assess the durability and safety of mesh use.

Keywords: *Laparoscopic posterior mesh rectopexy, Laparoscopic suture rectopexy, Rectal prolapse.*

INTRODUCTION

Rectal prolapse occurs when part or the entire rectum slips out through the anus. This condition tends to affect older women more frequently. There are two main types: a full-thickness prolapse, where the entire rectal wall pushes through, and a partial prolapse, where only the inner lining comes out.[1] The full thickness of the rectal wall slides out through the anus in total rectal prolapse, frequently manifesting as a folded or circular protrusion. On the other hand, when the rectal wall collapses inward without extending outside the anal orifice, it is referred to as incomplete prolapse or internal rectal intussusception. Clinically, this can be tricky to differentiate from mucosal prolapse, where only the inner lining of the rectum or anal canal protrudes. Because they can look similar, mucosal prolapse is often mistaken for full rectal prolapse, even though the treatment options for each are quite different.[2] Mucosal prolapse involves only a part of the rectal wall or just the lining of the anal canal, rather than the entire thickness of the rectum. It's important to distinguish this from full rectal prolapse, as the surgical treatment options for each condition are different.[2]

The exact etiology is unknown; however, some predisposing factors are identified, which are: deep rectovaginal pouch in females, rectal intussusception, perineal nerve injury, relaxation of the lateral ligaments, and the inertia of the pelvic floor.[3] Frequently observed symptoms of rectal prolapse include a visible bulge from

the anus, bleeding, frequent urges to have a bowel movement, and a constant feeling of needing to pass stool (tenesmus). In the early stages, the rectum typically only protrudes during bowel movements, but over time, the bulge can happen more often and become more severe. Many patients also experience mucus leaking from the anus and difficulty controlling bowel movements (fecal incontinence). This mucus discharge is usually due to reduced resting pressure in the rectum and weakening or relaxation of the anal sphincter.[4] Bleeding is a common complication when a prolapsed rectum isn't promptly pushed back into place. If the bleeding becomes heavy or signs of tissue strangulation appear, urgent medical attention is needed. When rectal prolapse goes untreated for a long time, it can also lead to issues with the urinary system, such as the formation of bladder stones or narrowing of the urethra.[5]

For the treatment of rectal prolapse, several trans-abdominal and perineal surgical procedures have been reported; nevertheless, the selection of treatment differs significantly among nations.[6] Transabdominal procedures, done either through open surgery (laparotomy) or minimally invasive techniques (laparoscopy), often involve securing the rectum with mesh. These surgeries were once believed to offer stronger, longer-lasting repairs with lower chances of the prolapse coming back compared to perineal methods. However, more recent research has shown that recurrence rates may actually be higher than previously expected.[7] A study reported the outcome, such as the Postoperative constipation score in laparoscopic posterior mesh rectopexy vs laparoscopic suture rectopexy for complete rectal prolapse patients (5.52 + 4.52 vs 8.0 + 4.16).[8] There is an ongoing debate about the most effective surgical approach for treating complete rectal prolapse. The limited research available so far shows mixed outcomes for the different techniques. This study aims to directly compare two common laparoscopic procedures-posterior mesh rectopexy and posterior suture rectopexy to evaluate their effectiveness in managing complete rectal prolapse. The results of this study will be shared with medical professionals, which will help to adopt better treatment choices to prevent prolonged morbidity and recommend effective treatment options among patients with an elongated sigmoid colon with significant constipation. The objective of this study is to compare the efficacy of laparoscopic posterior mesh rectopexy and laparoscopic suture rectopexy in the treatment of complete rectal prolapse.

METHODS

Operational Definition: Complete rectal prolapse (also known as procidentia) is defined as a full-thickness circumferential protrusion of the rectal wall through the anal canal, visible externally, especially during straining or defecation. The diagnosis is confirmed by clinical examination, during which concentric mucosal folds are observed on the prolapsed segment, distinguishing it from mucosal prolapse or hemorrhoids.

A comparative cross-sectional study was conducted in the Department of General Surgery, Khyber Teaching Hospital, Peshawar (576/DME/KMC dated 29-08-2022) over two years. Participants were selected using consecutive non-probability sampling, and the sample size of 98 patients (49 per group) was calculated using the Epi Info™ sample size calculator (CDC, USA), based on WHO-recommended statistical methods with 80% power and a 95% confidence level, using parameters derived from previous studies on laparoscopic rectopexy outcomes. However, due to loss to follow-up and inadequate patient data, the final analyzed sample comprised 77 patients. Approval for this study was granted by the Ethical Review Board of Khyber Medical College and by the College of Physicians and Surgeons Pakistan (CPSP), Karachi. Patients aged 18–70 years of both genders with complete rectal prolapse were included after providing written informed consent. Patients with pregnancy, coagulation disorders, chronic liver disease, or hepatitis B or C were excluded.

Using block randomization, participants were split into two groups at random. While Group B had laparoscopic posterior suture rectopexy, Group A underwent laparoscopic posterior mesh rectopexy. Before surgery, prophylactic antibiotics were administered, and all patients were directed to follow a liquid diet for two days. Under general anesthesia, the patient was put in the Trendelenburg position for the treatment. After creating pneumoperitoneum with a Veress needle, four laparoscopic ports were placed. Standard rectal mobilization was carried out, preserving the ureters and superior rectal artery. In the laparoscopic posterior mesh rectopexy group, a polypropylene mesh (10 × 15 cm) was positioned in the retrorectal, presacral space with one end positioned at the lower extent of dissection on the pelvic floor and the proximal end of the mesh secured to the sacral promontory using 2/0 Vicryl, followed by peritoneal closure. In the laparoscopic posterior suture rectopexy group, a single Vicryl 2/0 suture was placed between the lateral rectal wall and presacral fascia over the sacral promontory, and the peritoneum was then closed.

Postoperative assessment included looking for recurrence of prolapse at 30 and 60 days, constipation score, which was recorded 30 days after surgery, and the Fecal Incontinence Severity Index (FISI), which was evaluated 60 days postoperatively. Data collection was conducted under the supervision of a consultant with at least three years of post-fellowship experience. The statistical analysis was carried out with SPSS version 25.

The mean ± standard deviation (SD) was used to represent numerical variables like age, operational time, and postoperative constipation score, while frequencies and percentages were used to represent categorical variables like gender, diabetes, hypertension, and intraoperative hemorrhage. A p-value of less than 0.05 is deemed statistically significant. The independent sample t-test was used to compare postoperative constipation ratings between the two groups. To address potential confounders, the data were stratified based on age, gender, operative time, diabetes, and hypertension, followed by a post-stratification independent sample t-test for statistical significance. Results were analyzed and presented using descriptive and inferential statistics in tabular format.

RESULTS

The two groups' baseline study participant characteristics were similar. The two groups' chief complaints were similar, and there was no statistically significant difference in age, BMI, or gender distribution. These findings imply that the two groups were well-matched in terms of demographic parameters and that they had similar symptoms before surgery. (Table 1)

Table 1: Baseline characteristics

Baseline Characteristics	Baseline Characteristics	LPMR (n=40)	LPSR (n=37)	P-Value
Age (years)	Age (years)	42.38 ± 11.43	44.84 ± 11.35	0.347
BMI (Kg/m2)	BMI (Kg/m2)	26.83 ± 2.58	26.39 ± 2.97	0.498
Gender (M/F)	Gender (M/F)	22/18	28/9	0.057
Chief Complaints	Bleeding PR (n=24)	14	10	0.180
Chief Complaints	Prolapse Sensation (n=63)	32	31	0.180
Chief Complaints	Fecal Incontinence (n=51)	21	30	0.180
Chief Complaints	Difficult Evacuation (n=48)	18	28	0.180

The recurrence rate difference between the two groups was statistically significant (p = 0.004). It is possible that LPMR is a more lasting technique because the recurrence rate was lower in the LPMR group than in the LPSR group. However, neither the groups' post-operative pain levels nor prior surgery histories showed any discernible differences. (Table 2)

Table 2: Results of chi-square tests comparison b/w two groups

Variables		LPMR (n=40)	LPSR (n=37)	P-Value
Previous Surgery	No (n=67)	34	33	.585
Previous Surgery	Yes (n=10)	6	4	.585
Recurrence	No (n= 59)	36	23	0.004
Recurrence	Yes (n=18)	4	14	0.004
Post-Op Pain	Mild (n= 24)	13	11	0.869
Post-Op Pain	Moderate (n= 20)	11	9	0.869
Post-Op Pain	Severe (n= 33)	16	17	0.869

The length of hospital stay and intraoperative blood loss were not significantly different between the two groups. Nevertheless, the LPSR group's operating time was much longer ($p < 0.001$). Furthermore, reduced constipation ratings ($p < 0.001$) and fecal incontinence severity index scores ($p = 0.001$), which indicate improved bowel function, were substantially superior post-operative outcomes for the LPMR group. (Table 3)

Table 3: Results of independent sample t-test

Outcome Variables	LPMR (N=40)	LPSR (N=37)	P-Value
Length of Hospital Stay (Days)	2.24 ± 0.79	2.07 ± 1.02	.404
Intra-op Blood Loss (ml)	42.42 ± 16.14	42.16 ± 13.880	.941
Operative Time (Minutes)	102.91 ± 11.74	121.70 ± 9.29	.000
Post-op Constipation Score	4.59 ± 1.31	6.29 ± 1.76	.000
Post-op Fecal Incontinence Severity Index	6.35 ± 3.78	9.16 ± 3.63	.001

Comparison of post-op constipation and fecal incontinence scores

The box plots will show the post-operative constipation and the severity of fecal incontinence scores using the fecal incontinence severity index (FISI) scores in the LPMR and LPSR groups. The LPMR group has a smaller median score in the constipation score box plot, with less

dispersion represented by the interquartile range (IQR), indicating that overall the group has fewer variations and better results than the LPSR group, which has more variation represented by the higher median score. Correspondingly, the LPMR group has a smaller median score in the FISI score box plot with fewer outliers, and the LPSR group has a larger median score with a broader IQR and outliers, which show more variability in fecal incontinence severity. The results indicate the possible benefits of LPMR in comparison to LPSR in bowel functions during post-operation.

DISCUSSION

In a comparative study evaluating laparoscopic posterior mesh rectopexy (LPMR) and laparoscopic suture rectopexy (LPSR) for the management of rectal prolapse, LPMR demonstrated greater efficacy, with lower recurrence rates, improved bowel function, and higher operative efficiency. There was no significant difference between the groups in the demographic profiles, the baseline characteristics, and the chief complaints of the groups, thereby eliminating the chances of confounders and enhancing our comparisons.

One of our study's most noteworthy findings was that the LPMR group experienced a reduced risk of recurrence than the LPSR group ($p = 0.004$). This is in line with other research that found mesh rectopexy had reduced recurrence rates because of the mechanical support it offers to sustain the rectal fixation.[9] Similarly, mesh augmentation was found to have decreased recurrence rates in long-term follow-up when compared to suture-only procedures.[10]

Interestingly, despite the fact that some patients were afraid of potential mesh-related issues, including erosion or infection.[11,12] There were no discernible variations in the two groups' length of hospital stay or the intensity of post-operative discomfort, according to our study. This is in tandem with reports that the use of modern meshes and surgical procedures has reduced these risks to a minimum.[11,13]

The LPMR group had significantly reduced operative time ($p < 0.001$), which may be due to the simplicity of the fixation technique enabled by mesh placement as opposed to the elaborate multiple suture anchoring in LPSR. This finding contrasts with some prior studies where mesh application was perceived as more technically demanding;[14] however, the learning curve and surgeon experience might explain these differences.

The LPMR group saw significantly improved post-operative functional results. The LPMR group had substantially reduced ratings for constipation and fecal incontinence severity index (FISI) ($p < 0.001$ and $p = 0.001$, respectively). Previous literature has reported varying results regarding bowel function following rectopexy. Some studies suggested that posterior rectopexy (especially suture rectopexy) may exacerbate constipation by causing fibrosis around the rectum or impairing recto-sacral mobility.[8,15] In contrast, mesh rectopexy, by providing broader and more uniform support without excessive rectal tension, may preserve rectal compliance and improve defecatory function, as suggested by our results.

Notably, the two groups' duration of hospital stay and intraoperative blood loss were similar, suggesting that the decision between LPMR and LPSR did not affect immediate perioperative morbidity. This finding is in line with previous studies demonstrating that minimally invasive rectopexy techniques have favorable safety profiles irrespective of fixation method.[16,17]

Despite the encouraging outcomes associated with LPMR, it is important to acknowledge potential limitations. Mesh-related complications, though not observed in our short-term follow-up, remain a concern in longer follow-up periods and warrant vigilant monitoring.[11,13] Moreover, our sample size, while adequate to detect significant differences in primary outcomes, may not be sufficient to detect rarer adverse events.

CONCLUSION

According to this study's findings, LPMR would be a better surgical choice than LPSR in terms of reduced recurrence rates and enhanced post-operative bowel function, especially with regard to the degree of constipation and fecal incontinence. To confirm these results and create firm treatment guidelines, more research with bigger sample sizes and longer follow-ups is advised.

LIMITATIONS

Future randomized controlled trials with long-term follow-up are essential to confirm the sustained benefits of LPMR over LPSR and to monitor for potential mesh-related complications.

SUGGESTIONS / RECOMMENDATIONS

One of the strengths of our study is the comparative design with well-matched baseline characteristics, ensuring that observed differences are likely attributable to the surgical technique rather than patient-related factors.

CONFLICT OF INTEREST / DISCLOSURE

None.

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REFERENCES

1. Van der Schans EM, Paulides TJ, Wijffels NA, Consten EC. Management of Patients With Rectal Prolapse: The 2017 Dutch Guidelines. Tech Coloproctol. 2018;22(8):589-96.
2. Gallo G, Martellucci J, Pellino G, Ghiselli R, Infantino A, Pucciani F, et al. Consensus Statement of the Italian Society of Colorectal Surgery (SICCR): Management and Treatment of Complete Rectal Prolapse. Tech Coloproctol. 2018;22(12):919-31.
3. Attaallah W, Akmercan A, Feratoglu H. The Role of Rectal Redundancy in the Pathophysiology of Rectal Prolapse: A Pilot Study. Ann Surg Treat Res. 2022 May;102(5):289-93.
4. Tsunoda A. Surgical Treatment of Rectal Prolapse in the Laparoscopic Era: A Review of the Literature. J Anus Rectum Colon. 2020 Jul;4(3):89-99.
5. Suman MA, Sarkar MH, Ahmed I, Abedin S, Islam MS, Islam SN. Evaluation of Delorme's Procedure in the Treatment of Complete Rectal Prolapse: A Comparison With Abdominal Rectopexy. J Teach Assoc. 2021 Jan;34(1):40-6.
6. Hori T, Yasukawa D, Machimoto T, Kadokawa Y, Hata T, et al. Surgical Options for Full-Thickness Rectal Prolapse: Current Status and Institutional Choice. Ann Gastroenterol. 2018 Mar-Apr;31(2):188-95.
7. Senapati A, Gray RG, Middleton LJ, Harding J, Hills RK, Armitage NC, et al; PROSPER Collaborative Group. PROSPER: A Randomised Comparison of Surgical Treatments for Rectal Prolapse. Colorectal Dis. 2013 Jul;15(7):858-68.
8. Hidaka J, Elfeki H, Duelund-Jakobsen J, Laurberg S, Lundby L. Functional Outcome After Laparoscopic Posterior Sutured Rectopexy Versus Mesh Rectopexy for Rectal Prolapse: Six-Year Follow-Up of a Double-Blind, Randomized Single-Center Study. Clin Med. 2019 Mar;16(3):18-22.
9. Abd-Elfattah MK, Maged MI, Omar E, Mohamed AM. Laparoscopic Management of Recurrent Complete Rectal Prolapse: A Meta-Analysis Study. Med J Cairo Univ. 2022 Jun;90(6):849-67.
10. Tou S, Brown SR, Malik AI, Nelson RL. Surgery for Complete Rectal Prolapse in Adults. Cochrane Database Syst Rev. 2008;(4):CD001758.
11. Dyrberg DL, Nordentoft T, Rosenstock S. Laparoscopic Posterior Mesh Rectopexy for Rectal Prolapse Is a Safe Procedure in Older Patients: A Prospective Follow-Up Study. Scand J Surg. 2015 Dec;104(4):227-32.
12. Lundby L, Iversen LH, Buntzen S, Wara P, Høyer K, Laurberg S. Bowel Function After Laparoscopic Posterior Sutured Rectopexy Versus Ventral Mesh Rectopexy for Rectal Prolapse: A Double-Blind, Randomised Single-Centre Study. Lancet Gastroenterol Hepatol. 2016 Dec;1(4):291-7.
13. Bachoo P, Brazzelli M, Grant A. Surgery for Complete Rectal Prolapse in Adults. Cochrane Database Syst Rev. 2000;(2):CD001758.
14. Madiba TE, Baig MK, Wexner SD. Surgical Management of Rectal Prolapse. Arch Surg. 2005 Jan;140(1):63-73.
15. Rockwood TH, Church JM, Fleshman JW, Kane RL, Mavrantonis C, Thorson AG, et al. Fecal Incontinence Quality of Life Scale: Quality of Life Instrument for Patients With Fecal Incontinence. Dis Colon Rectum. 2000 Jan;43(1):9-16.
16. Ganapathi SK, Subbiah R, Rudramurthy S, Kakkilaya H, Ramakrishnan P, Chinnusamy P. Laparoscopic Posterior Rectopexy for Complete Rectal Prolapse: Is It the Ideal Procedure for Males? J Minim Access Surg. 2022 Apr;18(2):295-301.
17. Hajibandeh S, Hajibandeh S, Arun C, Adeyemo A, McIlroy B, Peravali R. Meta-Analysis of Laparoscopic Mesh Rectopexy Versus Posterior Sutured Rectopexy for Management of Complete Rectal Prolapse. Int J Colorectal Dis. 2021 Jul;36:1357-66.