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Original Research Article

Prospective Randomised Study Comparing Laparoscopic Rectopexy Verses Open Rectopexy in case of complete Rectal Prolapse

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Abstract:

Background: Full-thickness rectal prolapse (FTRP) significantly impairs quality of life and typically requires surgical involvement. The study purpose to assess the perioperative and functional outcomes of open and laparoscopic rectopexy in patients with FTRP.

Methods: A study was carried out at Shri Balaji Institute of Medical Sciences, Raipur, from December 2020 to February 2022. Forty patients with clinically diagnosed FTRP were subgroup randomly: Group A had laparoscopic rectopexy and Group B had open rectopexy (n=20 each). Postoperative outcomes including hospital stay, blood loss, pain, recovery milestones, complications and operative time were evaluated. Functional outcomes were assessed using the CCF-FIS and constipation ratings over a 3-month follow-up.

Results: The average operative time was longer in the laparoscopic group (150.95 ± 38.98 min vs. 102.20 ± 19.47 min), but this group experienced significantly less hemoglobin drop, shorter hospital stays (4.25 ± 1.88 vs. 7.85 ± 3.54 days), earlier mobilization, and quicker return to oral diet. Postoperative complications were fewer in the laparoscopic group. Both groups showed improvement in fecal incontinence and constipation, though a favorable trend toward earlier recovery was observed in the laparoscopic cohort. Recurrence occurred in one laparoscopic case.

Conclusion: Laparoscopic rectopexy offers significant perioperative advantages over open rectopexy, including faster recovery and reduced morbidity, while maintaining comparable efficacy in symptom control. These findings support laparoscopic rectopexy as a safe and effective alternative in the management of FTRP.

Introduction

Full-thickness rectal prolapse (FTRP), another name for rectal prolapse the whole protrusion of the rectal wall over the anal canal [1]. At any age, elderly women are more frequently experience it, the female-to-male ratio range from 6:1 to 10:1 [2]. The exact etiology remains uncertain; however, several contributing factors have been suggested, including chronic constipation, anatomical defects such as weakened pelvic floor support, and childbirth-related injuries [3]. Clinically, patients often present with a protruding anal mass, bleeding, mucous discharge, pain, and incontinence, all of which significantly impair quality of life.

The pathophysiology of rectal prolapse has been explained by two main theories. Moschowitz (1912) proposed the sliding hernia theory, describing prolapse as a herniation of rectum caused by a deficiency in the pelvic fascia [4]. Rectal procidentia, according to Broden and Snellman, is a circumferential intussusception that starts roughly 6 to 8 cm from the anal margin [5]. Regardless of the underlying mechanism, factors such as loss of rectosacral attachments, redundant sigmoid colon, and a patulous anal sphincter are consistently implicated [6]. Rectal prolapse among older women is more linked to other pelvic floor conditions such cystocele and vaginal prolapse.

Surgical correction remains the treatment of choice for complete rectal prolapse, as conservative measures provide limited benefit. Procedures can be broadly divided into abdominal and perineal approaches [7]. While perineal techniques are often

preferred in frail or high-risk patients due to reduced anesthesia requirements, abdominal rectopexy is associated with superior functional outcomes and lower recurrence rates. With advances in minimally invasive surgery, laparoscopic rectopexy—particularly laparoscopic ventral mesh rectopexy—has emerged as the preferred approach, demonstrating reduced morbidity, faster recovery, and improved quality of life compared to traditional open procedures.

Although Western data strongly support laparoscopic techniques over open rectopexy, limited comparative studies exist in the Indian population [8]. Restoration of rectal anatomy, with or without resection, not only prevents recurrence but also improves bowel function and continence. Considering the lack of regional evidence, this prospective randomized trial was undertaken to evaluate and examine the effectiveness of laparoscopic versus open rectopexy in patients with FTRP.

Materials and Methods

Study Centre and Design: In the Department of General Surgery, Shri Balaji Institute of Medical Sciences, Raipur, between December 2020 and February 2022 study carried out. Forty patients with clinically diagnosed FTRP were subgroup randomly: laparoscopic and open rectopexy respectively Group A and B. Follow-up for three months.

Inclusion and Exclusion Criteria: Patients aged greater than 18 years with externally visible FTPR and an ASA score of I–III who provided written informed consent were included. Exclusion criteria were: refusal to undergo clinical evaluation or surgery, age <18 years, loss to follow-up for ≥3 months, or cases requiring sigmoidectomy or colectomy combined with rectopexy.

Preoperative Evaluation: All patients underwent detailed history-taking, physical examination, and proctoscopy. Baseline investigations included complete blood counts, coagulation profile, renal function tests, ECG, and echocardiography. Chest radiography was performed when indicated. Abdominal ultrasonography or CECT was performed to exclude intra-abdominal pathology, and colonoscopy or sigmoidoscopy was used to rule out intraluminal causes.

Randomization: Eligible patients were assigned serial numbers from 1 to 40. Randomization was carried out using two-digit random numbers generated from a non-repetitive random number table. The first 20 numbers selected were allocated to the laparoscopic group (Group A), and the remaining 20 were assigned to the open rectopexy group (Group B).

Anesthesia and Perioperative Care: All patients received general anesthesia with a standardized protocol comprising induction with propofol and fentanyl, followed by muscle relaxation and endotracheal intubation. Neuromuscular blockade was achieved with atracurium and reversed with an anticholinesterase agent. Intraoperative monitoring included ECG, pulse oximetry, and end-tidal CO_2. Both groups received similar postoperative care, including intravenous fluids, analgesics, and antibiotics.

Surgical Technique

Open Posterior Mesh Rectopexy: A midline lower abdominal incision was made. The rectosigmoid junction was mobilized, and the rectum was dissected circumferentially to the pelvic floor, safeguarding the ureters and hypogastric nerves. A 7.5 × 15 cm prolene mesh was tailored, fixed posteriorly to the sacral promontory, and anchored to the rectum with 2–3 non-absorbable sutures. Hemostasis was achieved, and the abdomen was closed in layers.

Laparoscopic Posterior Mesh Rectopexy: A standard five-port technique was used with pneumoperitoneum created by CO_2 insufflation. After mobilizing the rectosigmoid junction, a distal sacral promontory peritoneal incision was performed in the shape of a J. Dissection was extended to the pelvic floor, safeguarding ureters and hypogastric nerves. The prolene mesh (7.5 × 15 cm) was fixed posteriorly to the sacral promontory and anchored to the rectum with two to three non-absorbable sutures. Peritoneal closure was performed, and ports were removed.

Outcomes and Parameters Recorded: The following parameters were assessed: postoperative pain (at 12, 24, and 48 hours), intraoperative blood loss (Hb drop), operative time, recovery time, duration of hospital stay, recurrence, and complications such as wound infection, bleeding, mesh infection, or pelvic infection. The Cleveland Clinic Florida Fecal Incontinence Score (CCF-FIS) and constipation ratings were used to evaluate functional results.

Statistical Analysis: Data were in mean ± SD or percentages. Normality of distribution was assessed using the ANOVA with Bonferroni correction and Kolmogorov–Smirnov test. paired and unpaired way Student's t-test was used for parametric variables was applied for repeated measures. Fisher's exact test or Chi-square was employed for categorical variables. SPSS v22.0 was used for statistical analysis. P-values less than 0.05 were regarded as statistically significant.

Results

The study comprised 40 patients with full rectal prolapse, 20 of whom (50%) had laparoscopic rectopexy and 20 of whom (50%) had open rectopexy.

Demographic Profile: The mean age of patients in the laparoscopic group was 69.45 ± 7.93 years, compared to 67.75 ± 6.91 years in the open group. The majority of patients were aged >60 years (85%). With respect to gender distribution, 16 (40%) patients were female and 24 (60%) were male, and both groups were comparable **(Table 1)**.

Table 1: ASA Score Comparison

ASA Score	Laproscopic rectopexy	Open rectopexy
I	8	9
II	11	10
III	1	1
Total	20	20

Surgical Parameters: The length of hospital stay was 4.25 ± 1.88 days in laparoscopic rectopexy and in open rectopexy 7.85 ± 3.54 days. Conversely, the mean operational time was the open group 102.20 ± 19.47 min and 150.95 ± 38.98 min in the laparoscopic group.

Postoperative Recovery: On day 1, tolerance of clear fluids was noted in 90% of laparoscopic patients and 75% in the open group. Early mobilization on day 1 was 75% in the laparoscopic group. Similarly, tolerance of solid diet on day 2 was 85% in the laparoscopic group (Table 2).

Table 2: Post-Surgical Recovery

Parameter	Laparoscopic rectopexy	Open rectopexy	p-value
Clear fluid on Day 1	18 (90%)	15 (75%)	0.204
Fully mobile on Day 1	15 (75%)	7 (35%)	0.012
Solid diet on Day 2	17 (85%)	10 (50%)	0.020

Hemoglobin Parameters: Between the groups preoperative hemoglobin levels were compare. However, postoperative hemoglobin was in the open group 8.36 ± 2.12 g/dl and 11.23 ± 1.42 g/dl in the laparoscopic group. The mean hemoglobin drop was–2.20 ± 1.43 in laparoscopic patients and in open rectopexy –4.59 ± 2.2.

Functional Outcomes

Improvement in Fecal Incontinence: At day 7, improvement was seen in 8 in the open group and 12 patients in the laparoscopic group. At 1 month, the improvement persisted in 11 laparoscopic and 8 open cases, and at 3 months in 11 versus 6 cases respectively.

Improvement in Constipation: Constipation improved in 11 (55%) laparoscopic and 10 (50%) open patients on day 7. At 1 and 3 months, both groups showed comparable improvement (45% each).

Discussion

Rectal prolapse remains a complex surgical condition for which numerous operative techniques have been described, yet no single procedure is universally accepted as the gold standard. The principal aim of surgery is to restore normal rectal anatomy, alleviate symptoms such as constipation and incontinence, and minimize recurrence with acceptable morbidity. Open rectopexy has traditionally been the preferred operation due to its technical simplicity and reliable outcomes. However, with the advent of minimally invasive surgery, laparoscopic approaches have gained wide acceptance because of their association with lower recurrence rates, faster recovery, and improved functional results [9].

The present prospective comparative study demonstrated that both laparoscopic and open rectopexy are effective procedures for managing complete rectal prolapse. The two groups were comparable in terms of demographic characteristics, ASA scores, and baseline functional status, confirming appropriate randomization. Similar to previous reports, OT was significantly more in the LG; however, this was offset by the advantage of a shorter hospital stay and earlier postoperative recovery [10]. Patients undergoing laparoscopic rectopexy achieved earlier mobilization and tolerated oral intake sooner than those undergoing open rectopexy, findings consistent with the work of Abdelrahman and Khalil as well as other contemporary series.

Intraoperative blood loss and postoperative hemoglobin drop were significantly lower in the laparoscopic group, reinforcing the hemostatic advantage of minimally invasive surgery. Comparable findings have been reported that highlighted reduced surgical trauma and improved perioperative outcomes with laparoscopic techniques [11]. Wound-related complications were

minimal and confined to the open group, while no pelvic infections were recorded in either arm.

Functional outcomes in terms of improvement in constipation and fecal incontinence were favorable in both groups. Although no statistically significant difference was observed between laparoscopic and open rectopexy in functional recovery, laparoscopic patients consistently demonstrated slightly better continence scores at follow-up. This trend aligns with the results, who also reported comparable functional outcomes between the two approaches but emphasized the faster recovery profile of laparoscopic rectopexy [12, 13]. Importantly, both surgical methods achieved significant improvement from baseline, underscoring their effectiveness in symptom control [14].

Recurrence of prolapse was rare in this study, with one case (5%) reported in the laparoscopic group at three months, and none in the open group [15]. Although the difference was not statistically significant, this observation is consistent with recurrence rates of 0.1–6% reported in the literature [16]. It is possible that longer follow-up may reveal more meaningful differences in recurrence trends.

Pain assessment using VAS scores revealed lower postoperative pain in the laparoscopic group, although differences did not reach statistical significance. Nonetheless, the reduced analgesic requirement and faster return to diet highlight the clinical benefit of the minimally invasive approach. These findings reinforce the general consensus that laparoscopic rectopexy provides better perioperative outcomes while maintaining comparable efficacy to open rectopexy.

Despite its strengths, this study has drawback. The small sample size and the three months follow-up period, which restricts conclusions about long-term recurrence and durability of functional improvement. Being a single-center study may also limit generalizability. To offer more conclusive proof of the long-term relative results of laparoscopic and open rectopexy, more multicenter trials with bigger cohorts and longer follow-up are needed.

Conclusion

Laparoscopic rectopexy, while associated with a longer operative duration, offers distinct advantages over open rectopexy in the treating of complete rectal prolapse. Patients undergoing the laparoscopic approach experienced reduced intraoperative blood lost, less postoperative pain, and a significantly shorter hospital duration. In addition, early mobilization and quicker tolerance of a solid diet were observed, highlighting the faster recovery profile of minimally invasive surgery. Both laparoscopic and open rectopexy were effective in improving constipation and fecal incontinence; however, laparoscopic rectopexy demonstrated a more favorable trend toward earlier improvement in functional outcomes. These findings suggest that laparoscopic rectopexy is a safe and effective alternative to open rectopexy, providing superior perioperative benefits while maintaining comparable efficacy in symptom control.

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