

Perioperative Outcomes of Laparoscopic Rectopexy for the Treatment of Full-Thickness Rectal Prolapse: A single-center experience from Dhulikhel Hospital, Nepal

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ABSTRACT

Background

Complete rectal prolapse (CRP) is a full-thickness circumferential protrusion of the rectum through the anal canal that significantly impairs quality of life. Laparoscopic rectopexy has emerged as the preferred abdominal approach because of its favorable perioperative outcomes. However, evidence from Nepal remains limited.

Objective

To evaluate the perioperative outcomes of laparoscopic rectopexy in patients with complete rectal prolapse treated at a tertiary care center in Nepal.

Method

A retrospective observational study was conducted using a prospectively maintained database of patients who underwent laparoscopic rectopexy for complete rectal prolapse at Dhulikhel Hospital between January 2015 and July 2023. Patient demographics, operative details, perioperative outcomes, postoperative complications, length of hospital stay, and recurrence were reviewed and analyzed using descriptive statistics.

Result

Thirty-four patients (27 females and 7 males) underwent laparoscopic rectopexy during the study period. All patients presented with a protruding rectal mass per anus, with constipation and diarrhoea being the most common associated symptoms. Four patients who underwent laparoscopic ventral rectopexy had concomitant cystocele. The median operative time was 200 minutes, and the median postoperative hospital stay was 3 days. There was no perioperative mortality. During follow-up of up to 96 months, one patient developed recurrent rectal prolapse. Postoperative complications included urinary incontinence (11.8%), constipation (8.8%), discitis (2.9%), and postoperative pain (2.9%).

Conclusion

Laparoscopic rectopexy is a safe and effective treatment for complete rectal prolapse, with low perioperative morbidity, a short hospital stay, and a low recurrence rate. These findings support its feasibility as a minimally invasive treatment option in resource-limited settings.

KEY WORDS

Complete rectal prolapse, Laparoscopic rectopexy, Rectum

INTRODUCTION

Complete rectal prolapse (CRP) is defined as circumferential and full-thickness protrusion of the rectum out of the anal canal. CRP being quite common with an annual incidence of 2.5 per 100000.¹ The ratio of female to male ratio is 7:1.² Laparoscopic rectopexy is a minimally invasive approach as there is elimination of major incision resulting in less complication related to major abdominal wound.³ A study carried out in Japan showed postoperative complications such as spondylitis, UTI, pneumonia, internal hernia, intra-abdominal abscess occurring at around 0.4%.⁴ Recent studies have shown laparoscopic rectopexy reduces operative trauma, limiting the time in hospital and there is less recurrence rate compared to other surgical modalities which is less than 8.2% in follow up to 12-82 months.^{4,5} The mean hospital stay was 6.8 days in the open abdominal surgery and 2.5 days in the laparoscopic group. The overall complication rate was 10.7%, mesh-related morbidity was 0.45%, and vaginal suture-related morbidity was 1.33%.⁶ Though multiple studies have been performed world-wide which proves its efficiency and efficacy, there have been inadequate studies in context to Nepal. In our hospital setting, two modalities of laparoscopic rectopexy are commonly used: Laparoscopic Posterior Rectopexy (LPR) and Laparoscopic Ventral Rectopexy (LVR). The aim of study is to review and highlight the perioperative achieved with this technique in our hospital setting and give a general idea about recurrence rate, perioperative complications and duration of hospital stay with this surgical procedure.

METHODS

This retrospective observational study was conducted at Dhulikhel Hospital, Kathmandu University Hospital, Nepal. The study involved a retrospective review of a prospectively maintained institutional database of consecutive patients who underwent laparoscopic rectopexy for complete rectal prolapse between January 2015 and July 2023. Ethical approval for the study was obtained from the Institutional Review Committee (KUSMS-IRC). Written informed consent for surgery was obtained from all patients after explaining the procedure, its benefits, and potential complications. The requirement for additional informed consent for this retrospective analysis was waived by the Institutional Review Committee.

All consecutive patients diagnosed with complete rectal prolapse who underwent laparoscopic rectopexy during the study period were included.

Inclusion criteria

- Patients aged ≥ 16 years.
- Clinically confirmed complete (full-thickness) rectal prolapse.
- Patients who underwent laparoscopic posterior mesh

rectopexy, laparoscopic ventral mesh rectopexy, or laparoscopic suture rectopexy.

Exclusion criteria

- Patients with partial-thickness or mucosal rectal prolapse.
- Patients managed by perineal procedures or open abdominal surgery.
- Patients with incomplete operative records.

All patients underwent a detailed clinical evaluation including history and physical examination. Clinical examination was performed in both the supine and squatting positions, with straining when prolapse was not evident at rest. Data retrieved from the database included age, sex, parity, bowel habits, duration of symptoms, associated pelvic organ prolapse, and previous pelvic floor surgery.

Routine preoperative laboratory investigations were performed in all patients. Female patients were routinely evaluated by the gynecology team for associated pelvic organ prolapse. Four patients undergoing laparoscopic ventral rectopexy had concomitant cystocele. Anorectal physiological investigations, including anal manometry and defecography, were not routinely performed because of limited local availability.

All patients underwent mechanical bowel preparation one day before surgery using oral bisacodyl. Intravenous prophylactic antibiotics (ceftriaxone 1 g and metronidazole 500 mg) were administered at induction of anesthesia. Deep venous thrombosis prophylaxis with subcutaneous enoxaparin was provided according to the institutional protocol.

Patients were placed in the modified lithotomy position with approximately 15° Trendelenburg tilt, and urinary catheterization was performed after induction of anesthesia. Pneumoperitoneum was established using a Veress needle through the left subcostal region. A standard four-port laparoscopic technique was used, consisting of two 10-mm and two 5-mm ports. After identification of the sacral promontory and right ureter, the peritoneum was incised on the right side, and pelvic dissection was continued toward the rectovesical or rectovaginal pouch according to the planned procedure.

Laparoscopic Posterior Mesh Rectopexy (Wells Procedure)

The rectum was circumferentially mobilized posteriorly to the level of the pelvic floor while preserving the surrounding structures. Following complete mobilization, a 5 X 5 cm polypropylene mesh was secured to the sacral promontory using tacks and wrapped approximately 270° around the posterior aspect of the rectum. The mesh was fixed to the rectum with interrupted polypropylene sutures on both sides. The peritoneum was closed over the mesh to minimize the risk of bowel adhesion, mesh exposure, and internal herniation. In selected patients with

redundant prolapsing mucosa, perineal mucosal excision was performed at the end of the procedure.

Laparoscopic Ventral Mesh Rectopexy

A purely anterior rectal dissection was performed within the rectovaginal septum to create a plane extending from the pouch of Douglas to the level of the pelvic floor. A peritoneal window was created at the level of the right sacral promontory using a monopolar diathermy hook dissector, and dissection was continued along the right border of the mesorectum toward the pouch of Douglas (Fig. 1). The distal extent of dissection was confirmed by digital rectal examination.

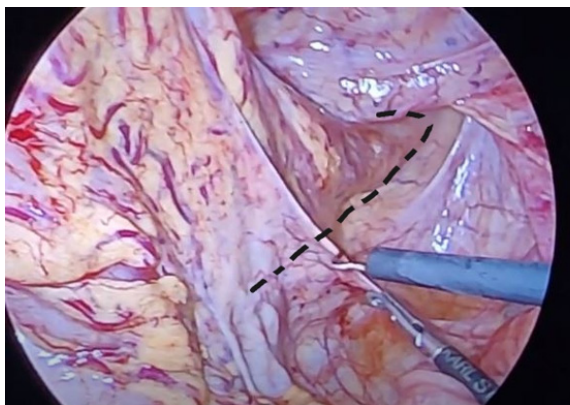


Figure 1. Creating peritoneal window with monopolar diathermy hook dissector at the level of the right sacral promontory over the right outer border of the mesorectum down toward the right side of the deep pouch of Douglas.

A polypropylene mesh measuring approximately 5 X 20 cm was introduced into the pelvis and positioned on the anterior aspect of the distal rectum. The mesh was secured to the anterior rectal wall at the level of the pelvic floor using interrupted polypropylene sutures. The proximal end of the mesh was then fixed to the sacral promontory using a ProTack™ fixation device (Fig. 2). Finally, the peritoneum was completely closed over the mesh using a continuous polydioxanone suture, thereby isolating the mesh from the peritoneal cavity (Fig. 3). Hemostasis was confirmed, and the port sites were closed in the standard fashion using Vicryl 1-0.

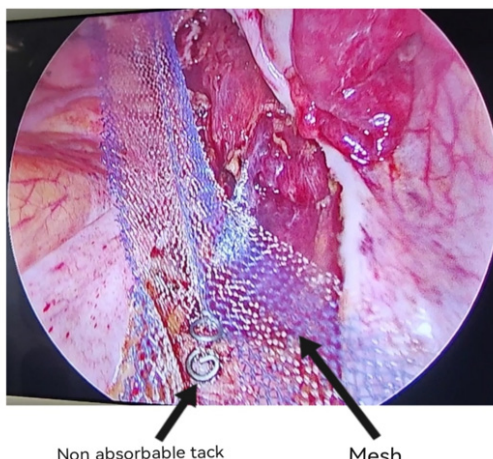


Figure 2. Showing mesh with non-absorbable tack.

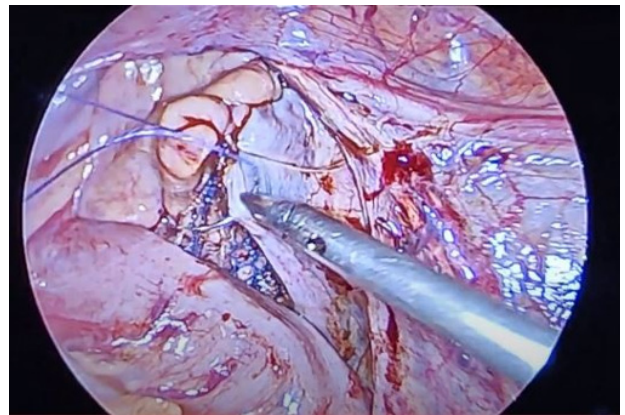


Figure 3. Closure of the peritoneum completely covering the mesh with polydioxanone suture in continuous fashion.

Laparoscopic Suture Rectopexy

Anterior rectal mobilization was continued to the level of the pelvic floor. The rectum was elevated cranially, and adequate reduction of the prolapse was confirmed by digital rectal examination. The posterior rectal seromuscular layer was fixed bilaterally to the presacral fascia using interrupted 2-0 polypropylene sutures. The lateral peritoneum was then reapproximated to the rectum using continuous 2-0 polydioxanone sutures to provide additional support and reduce postoperative adhesions.

Postoperative follow-up

Patients were routinely reviewed in the outpatient clinic at approximately 3 and 6 months after surgery. During follow-up visits, anorectal symptoms, recurrence, and postoperative complications were assessed through clinical evaluation. Long-term follow-up, where available, was obtained through outpatient records and telephone interviews using a standardized questionnaire.

The primary outcome was perioperative safety, including postoperative morbidity and mortality.

Secondary outcomes included operative time, length of postoperative hospital stay, time to first passage of flatus and stool, postoperative complications, and recurrence of rectal prolapse.

Data were analyzed using Microsoft Excel (Microsoft Corporation, Redmond, WA, USA). Continuous variables were summarized as median and range because of the small sample size and non-normal distribution of the data. Categorical variables were summarized as frequencies and percentages. As this was a descriptive observational study, no inferential statistical analyses or hypothesis testing were performed.

Follow-up and post-operative assessment

Patients were routinely followed in the outpatient clinic at approximately 3 and 6 months after surgery. During these visits, anorectal symptoms, recurrence, and postoperative complications were assessed through clinical history and physical examination. Long-term follow-up,

where available, was obtained from outpatient medical records and telephone interviews using a standardized questionnaire. The maximum available follow-up duration was 96 months.

Data were entered and analyzed using Microsoft Excel (Microsoft Corporation, Redmond, WA, USA). Continuous variables were summarized as either mean $\pm$ standard deviation (SD) or median with range, depending on the distribution and nature of the data. Categorical variables were presented as frequencies and percentages. As this was a descriptive retrospective study with a relatively small sample size, no inferential statistical analyses or hypothesis testing were performed.

RESULTS

Patient characteristics

Between January 2015 and July 2023, 34 patients underwent laparoscopic rectopexy for complete rectal prolapse. The cohort comprised 27 females with a median age of 60 years (range, 16–86 years) and seven males with a median age of 29 years (range, 20–65 years).

Operative details

All procedures were completed laparoscopically without conversion to open surgery. Laparoscopic posterior mesh rectopexy (Wells procedure) was performed in 21 patients (61.8%), laparoscopic ventral mesh rectopexy in 12 patients (35.3%), and laparoscopic suture rectopexy in one patient (2.9%). Four patients undergoing laparoscopic ventral mesh rectopexy had concomitant cystocele.

The median operative time was 200 minutes (range, 100–300 minutes). The median postoperative hospital stay was 3 days (range, 2–15 days). The median time to first passage of flatus was postoperative day 2 (range, postoperative day 1–5), while the median time to first passage of stool was postoperative day 3 (range, postoperative day 1–8).

Primary outcome

During the maximum available follow-up period of 96 months, one patient (2.9%) developed recurrent rectal prolapse, which was managed with a Thiersch procedure.

Secondary outcomes

There was no perioperative mortality. Postoperative complications included urinary incontinence in four patients (11.8%), constipation in three patients (8.8%), discitis in one patient (2.9%), and postoperative pain in one patient (2.9%). One patient with discitis required prolonged hospitalization (15 days). Two patients who underwent laparoscopic posterior mesh rectopexy reported new-onset constipation during follow-up, which was successfully managed conservatively.

DISCUSSIONS

This study evaluated the perioperative outcomes of laparoscopic rectopexy for the treatment of complete rectal prolapse at a tertiary care center in Nepal. The findings demonstrate that laparoscopic rectopexy can be safely performed in a resource-limited setting, with no perioperative mortality, a short median postoperative hospital stay, acceptable postoperative morbidity, and a low recurrence rate during the available follow-up period. These findings are consistent with published literature supporting laparoscopic rectopexy as an effective minimally invasive approach for the management of complete rectal prolapse.^{6,7}

Complete rectal prolapse predominantly affected female patients in our study, with a female-to-male ratio of 3.86:1. This finding is consistent with previous reports demonstrating a higher prevalence among women, although the female predominance in our cohort was lower than that reported by de Bruijn et al., who observed a female-to-male ratio of 12.3:1 with a median age of 66 years.⁸ Gonzalez-Argente et al. reported that 34.3% of women undergoing surgery for rectal prolapse had associated genital organ prolapse, while concomitant rectal and pelvic organ prolapse has been reported in 14%–55% of patients.^{8,9} In our series, four patients undergoing laparoscopic ventral mesh rectopexy had associated cystocele, highlighting the importance of evaluating associated pelvic floor disorders before surgery. Previous imaging studies have also demonstrated that anorectal structural abnormalities such as rectocele, intussusception, and mucosal prolapse may be present even in asymptomatic individuals, emphasizing the complex pathophysiology of pelvic floor disorders.¹⁰

Laparoscopic posterior mesh rectopexy and laparoscopic ventral mesh rectopexy are well-established abdominal procedures for the management of complete rectal prolapse. Previous studies have reported mean operative times of approximately 105 minutes for laparoscopic posterior rectopexy, 122 minutes for laparoscopic ventral rectopexy, and 100.8 ± 12.4 minutes for laparoscopic suture rectopexy.^{11,12} The median operative time in our study was longer (200 minutes), which likely reflects the learning curve associated with the introduction of advanced laparoscopic pelvic surgery and increasing surgical experience over the study period.

Despite the longer operative duration, postoperative recovery was satisfactory. The median postoperative hospital stay was three days, which is comparable to previously published laparoscopic series and shorter than that reported following open abdominal rectopexy.^{6,11,13} Similarly, the early return of bowel function observed in our patients supports the advantages of the minimally invasive approach.

Postoperative constipation remains an important concern following posterior rectopexy. Previous studies have

reported worsening constipation in 20-30% of patients, which has been attributed to autonomic nerve injury during posterior rectal mobilization or the presence of a redundant sigmoid colon causing delayed colonic transit.^{14,15} In our series, postoperative constipation occurred in three patients, while two patients who underwent laparoscopic posterior mesh rectopexy developed new-onset constipation during follow-up and were managed successfully with conservative treatment.

During the early phase of our laparoscopic rectopexy program, laparoscopic posterior mesh rectopexy was the preferred technique because of surgeon familiarity and training. With increasing experience, laparoscopic ventral mesh rectopexy has become the preferred procedure in our institution. Ventral rectopexy offers the additional advantage of addressing associated anterior compartment defects, such as cystocele, while minimizing posterior rectal dissection and preserving the autonomic nerves, thereby potentially reducing postoperative bowel, urinary, and sexual dysfunction.¹⁶

Minimally invasive abdominal rectopexy has become the preferred approach for patients who are fit for abdominal surgery because it is associated with less postoperative pain, shorter hospital stay, faster recovery, and improved visualization of the pelvic anatomy compared with open surgery.^{6,7} Although robotic ventral mesh rectopexy has demonstrated reduced blood loss, shorter hospital stay, and lower postoperative complication rates in some studies, these advantages must be balanced against longer operative times and substantially higher costs.^{17,18} In Nepal and other low- and middle-income countries, limited access to robotic platforms and resource constraints restrict its routine use. Therefore, laparoscopic rectopexy remains a practical, effective, and cost-efficient minimally invasive option, providing favorable perioperative outcomes when performed by appropriately trained surgeons.

In our study, one patient (2.9%) developed recurrent rectal prolapse during the available follow-up period and was successfully managed with a Thiersch procedure. Although the relatively small sample size and retrospective design preclude definitive conclusions regarding long-term recurrence, our findings are comparable to previously published series reporting recurrence rates of less than 10% following laparoscopic rectopexy.^{7,19}

One patient developed lumbar discitis following laparoscopic ventral mesh rectopexy, resulting in prolonged hospitalization. Although rare, discitis is a recognized complication related to sacral fixation during ventral mesh rectopexy and has been reported previously in the literature.²⁰⁻²² Early recognition and appropriate management are essential to minimize long-term morbidity (Fig. 4).



Figure 4. MRI of lumbosacral spine showing discitis at L4-L5 vertebra.

This study has several limitations. First, it was a retrospective single-center study with a relatively small sample size, limiting the generalizability of the findings. Second, no comparison group was available; therefore, direct comparison with alternative surgical approaches could not be performed. Third, postoperative functional outcomes were assessed using clinical history, physical examination, and telephone interviews rather than validated instruments such as the Wexner Constipation Score, Wexner Incontinence Score, Obstructed Defecation Syndrome (ODS) score, or disease-specific quality-of-life questionnaires. In addition, complete patient-level follow-up duration could not be reconstructed retrospectively for all patients; therefore, median follow-up duration, interquartile range, and follow-up interval analyses could not be reported. These limitations should be considered when interpreting our findings.

Despite these limitations, this study represents one of the few published Nepalese experiences evaluating laparoscopic rectopexy for complete rectal prolapse. Our findings demonstrate that favorable perioperative outcomes can be achieved in a resource-limited setting when the procedure is performed by experienced laparoscopic surgeons. Future prospective multicenter studies with larger sample sizes, standardized functional outcome measures, and longer follow-up are required to further evaluate long-term recurrence, functional outcomes, and quality of life after laparoscopic rectopexy.

CONCLUSION

Laparoscopic rectopexy is a safe and effective treatment for complete rectal prolapse, with low perioperative morbidity, a short hospital stay, and a low recurrence rate. These findings support its feasibility as a minimally invasive treatment option in resource-limited settings.

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