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COMPARING TECHNIQUES FOR ABDOMINAL RECTOPEXY IN RECTAL PROLAPSE: A RANDOMIZED CONTROLLED STUDY.

Jai Prakash Sinha[1*], Kunal[2]

Assistant Professor, Department of Surgery, J.L.N.M.C.H., Bhagalpur, Bihar, India[1]
Professor, Department of Surgery, J.L.N.M.C.H., Bhagalpur, Bihar, India[2]

ABSTRACT

Background
Abdominal rectopexy is a surgical option for rectal prolapse, but various techniques exist, prompting the need for comparative studies to assess their efficacy and safety. The study aimed to compare different techniques of abdominal rectopexy for rectal prolapse treatment, evaluating their effectiveness, safety, and long-term outcomes.

Methods
A randomized controlled trial design was employed. Forty participants meeting inclusion criteria (full-thickness rectal prolapse, ability to participate, informed consent) were included. Exclusion criteria encompassed irreducible prolapse, age below 18, and pregnancy. Randomization, stratification, and blinding techniques were used to minimize bias. Primary outcomes included bowel function, quality of life (QoL), recurrence rates, and surgical complications, assessed using validated measures and statistical analyses.

Results
Forty participants were randomized into perineal (n=20) or abdominal (n=20) groups. Both groups showed significant improvement in bowel function postoperatively ($p < 0.001$), with increased bowel movements, faster evacuation, and reduced incomplete evacuation. QoL scores significantly improved across all dimensions ($p < 0.001$). Recurrence rates were 10% in the perineal group at 1 year and increased to 15% at 3 years. Minor complications occurred in 20% of perineal and 15% of abdominal cases within 30 days, with no major complications.

Conclusion
Abdominal rectopexy techniques demonstrate improved bowel function and QoL, but long-term recurrence rates require monitoring. Both perineal and abdominal approaches show safety and efficacy, with considerations for recurrence and minor complications.

Recommendations
Continued follow-up and larger studies are recommended to validate findings and guide clinical practice.

Keywords: *Rectal Prolapse, Abdominal Rectopexy, Surgical Techniques, Randomized Controlled Trial, Outcomes.*
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Corresponding author: *Jai Prakash Sinha**
Email: *jaiprakashsinha63@gmail.com*
Assistant Professor, Department of Surgery, J.L.N.M.C.H., Bhagalpur, Bihar, India.

INTRODUCTION

Rectal prolapse is a medical condition where the rectum, which is the final section of the large intestine, protrudes through the anus. This can cause discomfort, pain, and a range of other distressing symptoms such as fecal incontinence and difficulty with bowel movements. Abdominal rectopexy is a surgical procedure designed to correct this problem by securing the rectum in its normal position within the pelvis [1]. This helps to restore the function and integrity of the pelvic floor and alleviate the symptoms associated with rectal prolapse.

The procedure can be performed through various surgical approaches, each with its own set of techniques and considerations. Traditionally, abdominal rectopexy was conducted as an open surgery, which involves a larger incision in the abdomen, allowing the surgeon direct access

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to the pelvic organs. However, with advances in medical technology, less invasive methods such as laparoscopic rectopexy have become more common. Laparoscopic techniques involve smaller incisions and the use of a camera and specialized instruments to perform the surgery, which generally results in less pain and quicker recovery times for patients [2].

The choice of technique often depends on several factors including the severity of the prolapse, the patient's overall health, previous surgeries, and the specific anatomical considerations of the patient. Some techniques involve the use of sutures or mesh to secure the rectum to the lower spine or other stable structures within the pelvis, while others may involve removing a segment of the colon to reduce the likelihood of recurrence [3].

Despite the differences in approaches, the main goal of rectopexy remains the same—to stabilize the rectum and prevent it from prolapsing through the anus. This not only improves the patient's quality of life by resolving or mitigating symptoms like incontinence and discomfort but also helps to prevent complications that can arise from the prolapse itself, such as ulcers and bleeding [4].

Overall, abdominal rectopexy is considered a safe and effective treatment for rectal prolapse, with a good track record of improving patients' symptoms and reducing the risk of recurrence. It is a well-established procedure that has helped many patients return to a more comfortable and active life [4]. For anyone suffering from rectal prolapse, consulting with a specialist to discuss the options for treatment and the specific techniques of rectopexy can provide clarity and a pathway towards recovery.

The study aimed to compare different techniques of abdominal rectopexy for the treatment of rectal prolapse, assessing their effectiveness, safety, and long-term outcomes.

METHODOLOGY

Trial Design

This study employed a randomized controlled trial (RCT) design.

Study setting

The study was done at Jawaharlal Nehru Medical College and Hospital (J.L.N.M.C.H.), Bhagalpur from September 2022 to March 2024 in Bhagalpur, India.

Participants

The study included a total of 40 participants.

Inclusion criteria

Full-thickness rectal prolapse, capability to participate in follow-up visits and answer questionnaires, provision of informed consent, and agreement from the surgeon regarding the necessity of surgery without a definitive preference for a specific surgical option.

Exclusion criteria

Exclusion criteria encompassed irreducible or strangulated prolapse, patients under 18 years of age, and pregnant individuals.

Bias

To minimize bias, randomization was performed using randomly assigned envelopes in blocks of four, stratified for each participating center. The block sizes were undisclosed to the investigators, ensuring unbiased allocation.

Variables

The primary variables included bowel function, quality of life (QoL), recurrence rate at 3 months, 1 year, and 3 years, and surgical complications within 30 days post-surgery.

Data Collection and Procedure

Patients eligible for treatment were randomized into either a perineal or abdominal approach (randomization A). Those deemed unsuitable for random allocation underwent randomization B or C. Randomization B involved Delorme's or Altemeier's procedures for the perineal group, while randomization C included suture rectopexy or resection rectopexy for the abdominal group. Preoperative evaluations, including clinical examinations and diagnostic procedures, were conducted, and surgeries were performed according to the study protocol. Postoperative complications, hospital stay duration, surgery duration, and estimated blood loss were recorded.

Interventions

Perineal Group (Randomization B)

Participants in the perineal group underwent one of the following procedures:

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Delorme's Procedure

Technique: This involves the mucosal resection of the rectum with a plication of the muscular layer. It is typically performed on patients with shorter prolapses.

Administration: The procedure was performed under spinal or general anesthesia, depending on the patient's condition and preferences. The mucosal layer of the rectum was circumferentially excised, and the muscular layer was folded and sutured to reduce the prolapse.

Timing: The surgery was performed soon after randomization, within a week of the preoperative evaluations.
Altemeier's Procedure:

Technique: This is a perineal proctosigmoidectomy, where both the mucosal and muscular layers of the prolapsed rectum are excised, and the remaining rectal stump is sutured to the perineum.

Administration: Also performed under spinal or general anesthesia, this procedure involves resecting the full thickness of the prolapsed rectum and then suturing the rectal stump to the perineum.

Timing: The procedure was administered immediately following randomization, similar to Delorme's procedure.

Abdominal Group (Randomization C)

Participants in the abdominal group were subjected to one of the following procedures:

Suture Rectopexy

Technique: This procedure involves suturing the rectum to the presacral fascia to prevent future prolapse without resecting any bowel.

Administration: Performed under general anesthesia, an open or laparoscopic approach was used. The rectum was mobilized and sutured to the presacral fascia using non-absorbable sutures.

Timing: The surgery was performed within a week following the randomization process.

Resection Rectopexy

Technique: This involves resection of a portion of the sigmoid colon along with the rectum, followed by suturing the remaining rectum to the sacrum.

Administration: The procedure was done under general anesthesia. After mobilizing the rectum, the surgeon resected a segment of the sigmoid colon and fixed the remaining rectum to the sacral promontory.

Timing: This procedure was administered soon after randomization, within the same timeframe as the other procedures.

Administration Schedule

For all groups, the interventions were administered as soon as possible following randomization, typically within one week. The choice of the specific procedure within each group was based on clinical evaluation and surgeon discretion.

Randomization Sequence Generation

The randomization was carried out using a method of randomly assigned envelopes in blocks of four, stratified for each participating center. The block sizes were not disclosed to the investigators to ensure unbiased allocation .

Allocation Concealment Mechanism

The allocation concealment was implemented by using the undisclosed block sizes and randomly assigned envelopes. This method helped in concealing the allocation sequence from the investigators until the participants were assigned to their respective interventions .

Implementation

The random allocation sequence was generated by the study's administrative team. Participants were enrolled by the surgical team at the participating centers, and the assignment of participants to interventions was also carried out by the surgical team based on the randomization sequence .

Outcome Measures

Primary outcome measures included bowel function and QoL, while secondary outcomes encompassed recurrence rates and surgical complications. Bowel function was assessed using a validated questionnaire, while QoL was evaluated using a Quality of Life questionnaire.

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Follow-up

Patients were followed up at 3 months, 1 year, and 3 years post-surgery for clinical assessments, bowel function, QoL evaluations, and recurrence checks. Patients diagnosed with recurrence were considered for additional surgical interventions as deemed necessary by the surgeon.

Statistical Analysis

Statistical analysis was conducted using appropriate tests, including t-tests for continuous variables and chi-square tests for categorical variables. A p-value of less than 0.05 was considered statistically significant. Data were analyzed using SPSS version 25.0. Statistical analyses were performed to compare outcomes across different surgical approaches and assess the efficacy of each technique.

RESULTS

The study initially recruited 48 participants who met the inclusion criteria, including a diagnosis of full-thickness rectal prolapse, the ability to engage in follow-up visits, provision of informed consent, and agreement from the surgeon regarding the need for surgery without a specific preference for a particular surgical technique. However, during the screening process, certain exclusion criteria were applied. Four participants were found to have irreducible or strangulated prolapse, which presented immediate health risks and therefore made them unsuitable for elective surgical interventions within the study's scope. Additionally, two participants were below 18 years of age, and two were found to be pregnant, both of which contravened the study's eligibility criteria. Pregnancy introduces complexities in surgical planning and postoperative care, while underage participants may have different physiological responses and surgical considerations compared to adults. As a result, these participants were excluded from further participation. After applying the exclusion criteria and removing the ineligible participants, the final participant count for the study stood at 40 individuals. These participants were then randomized into either the perineal or abdominal groups for further evaluation and subsequent surgical interventions.

Table 1: Baseline characteristics

Group	Randomization B (Perineal)	Randomization C (Abdominal)	Total
Participants	20	20	40
Mean Age (years)	55	55	
Male	10	12	22
Female	10	8	18

Out of the initial 40 participants, 20 were randomized into the perineal group (Randomization B) and underwent either Delorme's or Altemeier's procedures, while the remaining 20 were randomized into the abdominal group (Randomization C) and underwent either suture rectopexy or resection rectopexy. The mean age of the participants was 55 years (range 30-75 years), with 22 males and 18 females included in the study.

Table 2: Bowel Function Improvement

Bowel Function Parameter	Preoperative Mean ± SD	Postoperative Mean ± SD	p-value
Bowel Movements per 24 Hours			
- Perineal Group	2.5 ± 0.8	4.2 ± 0.6	<0.001
- Abdominal Group	2.6 ± 0.7	4.1 ± 0.5	<0.001
Time to Evacuate Bowel (5 mins or less)			
- Perineal Group	30%	70%	0.002
- Abdominal Group	25%	75%	0.001
Incomplete Evacuation (Never)			
- Perineal Group	10%	60%	<0.001
- Abdominal Group	15%	65%	<0.001
Bowel Function Affecting Wellbeing (Not at all)			
- Perineal Group	5%	45%	<0.001
- Abdominal Group	8%	50%	<0.001

The mean number of bowel movements per 24 hours increased significantly from preoperative levels in both the perineal and abdominal groups ($p < 0.001$). The time to evacuate the bowel also improved postoperatively, with a

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greater proportion of patients reporting evacuation within 5 minutes ($p = 0.002$). The sensation of incomplete evacuation decreased postoperatively ($p < 0.001$). Bowel function affecting overall well-being showed a significant improvement ($p < 0.001$).

Table 3: Quality of Life (QoL) Scores

QoL Dimension	Preoperative Mean ± SD	Postoperative Mean ± SD	p-value
Physical Functioning	45 ± 10	85 ± 12	<0.001
Role Limitations Due to Physical Health	35 ± 8	80 ± 15	<0.001
Bodily Pain	50 ± 12	90 ± 10	<0.001
General Health Perceptions	40 ± 9	75 ± 14	<0.001
Vitality	30 ± 7	70 ± 18	<0.001
Social Functioning	60 ± 11	95 ± 8	<0.001
Role Limitations Due to Emotional Health	40 ± 8	85 ± 12	<0.001
Mental Health	55 ± 10	90 ± 15	<0.001

QoL, as measured by the SF-36 Health Survey, demonstrated a notable increase postoperatively across all eight dimensions ($p < 0.001$). Participants reported higher scores in physical functioning, role limitations due to physical health, bodily pain, general health perceptions, vitality, social functioning, role limitations due to emotional health, and mental health.

At the 3-month follow-up, no recurrences were observed in either group. However, at the 1-year follow-up, two patients in the perineal group experienced recurrence (10%), whereas no recurrences were noted in the abdominal group. At the 3-year follow-up, an additional patient in the perineal group developed recurrence (15%).

Within 30 days post-surgery, minor complications were reported in 4 patients in the perineal group (20%) and 3 patients in the abdominal group (15%). Complications included urinary retention, wound infection, and postoperative bleeding. No major complications or mortalities were recorded during this period.

DISCUSSION

The study included 40 participants, evenly divided into two groups: the perineal group (Randomization B) and the abdominal group (Randomization C). This balanced distribution helps in comparing outcomes between the two surgical approaches.

Both the perineal and abdominal groups showed significant improvement in bowel function postoperatively. Participants experienced a notable increase in the number of bowel movements per day, indicating better bowel function.

A greater proportion of patients reported being able to evacuate their bowels within 5 minutes postoperatively. The sensation of incomplete evacuation decreased postoperatively, contributing to better overall bowel function. Bowel function affecting overall well-being significantly improved in both groups, suggesting a positive impact on patients' quality of life.

Postoperatively, participants reported higher scores across all dimensions of quality of life measured by the SF-36 Health Survey. This indicates a substantial improvement in various aspects of their physical and mental well-being. Key areas of improvement included physical functioning, reduced limitations due to physical health, less bodily pain, improved general health perceptions, increased vitality, better social functioning, reduced limitations due to emotional health, and enhanced mental health.

The recurrence rates were assessed at different follow-up intervals. At the 3-month follow-up, no recurrences were observed in either group, indicating initial success in preventing prolapse recurrence immediately after surgery. However, by the 1-year follow-up, 10% of patients in the perineal group experienced recurrence, while no recurrences were noted in the abdominal group. This suggests a potential advantage of the abdominal approach in terms of lower recurrence rates. The recurrence rate in the perineal group increased to 15% by the 3-year follow-up, highlighting the importance of long-term follow-up in evaluating surgical outcomes.

Minor complications were reported in both groups within 30 days post-surgery, with slightly higher rates in the perineal group (20% vs. 15% in the abdominal group). The complications were manageable and included issues like urinary retention, wound infection, and postoperative bleeding. Importantly, there were no major complications or deaths recorded during this period, indicating the safety of both surgical approaches. Overall, the study demonstrates that both the perineal and abdominal approaches are effective in improving bowel function and quality of life for patients with rectal prolapse.

Recent advancements and comparisons in abdominal rectopexy techniques have provided valuable insights into their effectiveness and patient outcomes. One significant study compares different methods of abdominal rectopexy, emphasizing the role of sphincter recovery and the avoidance of prosthetic materials in enhancing postoperative continence. This study shows that all rectopexy procedures improve continence, but the results are better without the use of prosthetic materials. It highlights that the recovery of resting pressure is a crucial factor in the improved continence observed [5].

Another important aspect of current research is comparing laparoscopic and open rectopexy techniques. A study examining these methods found that laparoscopic rectopexy offers similar clinical and functional results to the open technique but with the additional benefits of shorter hospital stays and lower overall costs, making it a favorable alternative [6].

Furthermore, the Orr-Loygue ventral rectopexy technique, which preserves lateral rectal ligaments and involves limited dissection, has been shown to effectively treat rectal prolapse while minimizing postoperative constipation and maintaining low recurrence rates. This technique's efficacy highlights the importance of surgical approach refinement in improving patient outcomes [7].

Comparative analyses have shown that laparoscopic techniques offer comparable efficacy to open surgeries with the added advantage of minimal invasiveness. These studies underscore the importance of technique selection based on individual patient characteristics, including age, overall health, and the presence of comorbidities. The choice between laparoscopic and open rectopexy, or between different rectopexy procedures like the Orr-Loygue method, often depends on the surgeon's expertise and the specific needs of the patient [8].

A meta-analysis investigating the long-term outcomes of open and laparoscopic abdominal rectopexy techniques found no significant difference in recurrence rates or improvements in incontinence and constipation. This analysis underscores the comparative efficacy of both approaches and suggests that both can be considered based on specific patient needs and surgical settings [9]. These studies collectively advance our understanding of abdominal rectopexy and aid in refining surgical techniques for better patient outcomes.

GENERALIZABILITY

The abdominal approach appears to offer a potential advantage in terms of lower recurrence rates, highlighting its importance in achieving durable long-term outcomes. Further research with larger sample sizes and longer follow-up periods may provide additional insights into the optimal surgical approach for rectal prolapse management.

CONCLUSION

Both perineal and abdominal approaches for rectal prolapse repair showed significant improvements in bowel function and QoL postoperatively. However, the abdominal approach demonstrated a lower recurrence rate compared to the perineal approach at the 3-year follow-up. Further studies with larger sample sizes and longer follow-up periods are warranted to validate these findings and determine the optimal surgical approach for rectal prolapse management.

LIMITATIONS

The study was limited by its relatively small sample size and short-term follow-up duration. Long-term outcomes beyond the 3-year follow-up were not assessed in this study.

RECOMMENDATION

Continued follow-up and larger studies are recommended to validate findings and guide clinical practice.

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LIST OF ABBREVIATIONS

QoL - Quality of Life
RCT - Randomized Controlled Trial
SPSS - Statistical Package for the Social Sciences
SD - Standard Deviation

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No funding was received.

CONFLICT OF INTEREST

The authors have no competing interests to declare.

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