e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2022; 14(5); 734-743

Original Research Article

Comparative Study of Laparoscopic Ventral Rectopexy Versus Laparoscopic Posterior Rectopexy for Complete Rectal Prolapse

Prashant Kumar Singh[1], Nadeem Ahmad[2], Kanchan Sonelal Baitha[3], Shashi Singh Pawar[4], Prem Prakash[5]

[1]Assistant Professor, General Surgery, IGIMS, Patna, Bihar, India.
[2]Assistant Professor, General Surgery, IGIMS, Patna, Bihar, India.
[3]Assistant Professor, General Surgery, IGIMS, Patna, Bihar, India.
[4]Assistant Professor, Surgical Oncology, IGIMS, Patna, Bihar, India.
[5]Additional Professor, General Surgery, IGIMS, Patna, Bihar, India.

Received: 15-03-2022 / Revised: 20-04-2022 / Accepted: 19-05-2022
Corresponding author: Dr. Kanchan Sonelal Baitha
Conflict of interest: Nil

Abstract

Background: There is no agreement about which laparoscopic rectopexy technique is best for treating complete rectal prolapse. Purpose was to compare functional outcome, the recurrence rate, and quality of life in patients treated with laparoscopic ventral rectopexy (LVR) versus the laparoscopic Wells rectopexy (LWR) for complete rectal prolapse.

Material & Methods: The study was conducted in the Department of general surgery, IGIMS, Patna, Bihar, India**.** A sample size of 30 patients was included in the study. The records of all the patients with complete/ full thickness rectal prolapse (FRP) who were operated on with laparoscopic rectopexy without sigmoid excision during the period of study was analyzed prospectively.

Results: The overall mean age of the study population was 55.4±14.5. 13 patients were females and 17 were males. There were only two conversions to open surgery in the LVR group. Mean operative time was significantly longer in LVR (121.5 – 27.8 minutes versus 105.7 – 18.7 minutes; P = .001).

Conclusions: In this study, both LVR and LWR successfully and safely corrected the prolapse and prevented recurrence in patients after long-term follow-up. Operative time and hospital length of stay are significantly shorter in LWR. High incontinence scores and age >70 are potential predictors of bad continence postoperatively. LVR appears to be more suitable for patients with a high constipation score and abnormal perineal descent.

Keywords: rectal prolapse, laparoscopic ventral rectopexy, laparoscopic Wells rectopexy

Introduction

Complete rectal prolapse is a benign condition that leads to problems with fecal incontinence and obstructed defecation. It has a negative effect on the patient's quality of life. [1] Surgical management can be done through abdominal or perineal approaches. The perineal approach has been traditionally reserved for older and debilitated patients as it is better tolerated and associated with a lower rate of complications, however, there are functional changes (urgency and

frequency) and higher recurrence rates. [2, 3] Abdominal approaches are associated with lower rates of recurrence, but often with more complications.4 Laparoscopic surgery combines the advantages of low recurrence rate and minimal complications. [5,6]

Many laparoscopic approaches have been developed for the treatment of complete rectal prolapse, such as resection rectopexy, posterior rectopexy, Well's rectopexy, and ventral rectopexy. Laparoscopic resection rectopexy is ideal for patients complaining of constipation with good continence. [7] Weakness of both the anal sphincters and pelvic floor muscles especially in multiparous females is an obstacle for this procedure. Moreover, complications of colon resection, including leaks, should be kept in mind. [8] Laparoscopic Wells rectopexy (LWR) has the advantage of low mortality rates and the lowest recurrence rates (close to 3%). Improvement of fecal incontinence postoperatively occurs in up to 90% of patients. [9] However, up to 20% of patients experience postoperative constipation. [10, 11] Laparoscopic ventral rectopexy (LVR) is gaining popularity in the treatment of complete rectal prolapse. Posterior dissection is limited to exposure of the sacral promontory, so there is little possibility for nerve injury. Studies reported the postoperative reduction in fecal incontinence in up to 90% of patients with complication rates ranging from 1.4% to 47%. [12] Until now, there are no clear data indicating whether LVR leads to a better outcome than LWR when considering recurrence rate, effect on perineal descent, and functional outcome. Hence, the aim of this study was to compare functional outcome, the recurrence rate, and quality of life in patients treated with LVR versus the LWR for complete rectal prolapse. Functional outcome measured by preoperative-to-postoperative change in ODS score was not significantly superior in patients who underwent ventral mesh rectopexy compared with those who had posterior sutured rectopexy.[13]

Material & Methods:

The study was conducted in the Department of general surgery, IGIMS, Patna, Bihar, India, after obtaining clearance from Institutional ethics committee (IEC). Informed written consent was obtained from each patient.

The study was a Prospective single center, parallel arm double-blind randomized control trial comparing two techniques of laparoscopic rectopexy. The study was prospectively registered at CTRI. The study was carried out from 2020 to August 2021.

Inclusion Criteria:

All patients older than 18 years presenting with full thickness rectal prolapse were candidates for inclusion in the study provided that they were medically cleared for general anesthesia and that they signed an informed consent.

There was no upper age limit for inclusion.

Exclusion Criteria:

1. Previous major abdominal surgery
2. Slow transit constipation, Hirschsprung's disease, inflammatory bowel disease, malignancy, diverticular disease and concomitant pelvic floor descent
3. Pregnancy
4. Antidepressants or drugs that cause constipation
5. Patients with comorbid illnesses as severe cardiac disease or chronic renal failure

Sample size: A sample size of 30 patients was included in the study. Eligible patients were informed about the study by the surgeon at the outpatient office of the Department of Surgery.

A computer-generated block randomization was used to create an allocation sequence to assign patients to the study arms. Allocation concealment

was assured by giving identity numbers to enrolled patients. The generator of the allocation was separated from the executor

Methodology

The records of all the patients with complete/ full thickness rectal prolapse (FRP) who were operated on with laparoscopic rectopexy without sigmoid excision during the period of study was analyzed prospectively.

All patients referred with a possible FRP were examined by a specialist in colorectal surgery. FRP was diagnosed with the patient placed in a straining chair as a circumferential protrusion of all rectal wall layers. All patients were treated by two surgeons including principal investigator at IGIMS, Patna.

Data on age, gender, and preoperative functional symptoms or discomfort: constipation (Wexner grading scale), incontinency (Wexner Incontinence Score), Preoperative Quality of life (Gastrointestinal quality of life index, GIQOL), size of the prolapse (cm), smoking (yes, no), alcohol intake (normal, abuse), NSAID or prednisolone treatment (yes, no), former prolapse surgery (yes, no, type), abdominal surgery (no, upper, lower), and comorbidity (pulmonary, cardiovascular disease, diabetes, cancer, or other chronic diseases) was recorded as per standard evaluation tools. Operating time was defined as time from skin incision to skin closure.

Per-operative complications included bowel lesions or bleeding defined as vascular lesions requiring suturing, long time electro-cautery, use of vaso-sealing materials, or need of per-operative transfusion. Reasons for conversion to open surgery were recorded.

Surgical Technique

1. Laparoscopic Posterior Rectopexy (LPR)

In the operation theatre under general anesthesia, patients were catheterized and placed in Trendelenberg's position.

After creation of pneumoperitoneum through a four-port approach, one supraumbilical telescopic port (10 mm), second right hand working port in right iliac fossa (10 mm), third left hand working port in left iliac fossa (5 mm), fourth little above the third as assistant port for retracting recto sigmoid junction (5 mm).

The dissection started by opening peritoneum on right side of rectum using harmonic scalpel after identifying right ureter and safeguarding it, then dissecting rectum from presacral fascia in holy plane of safety staying close to rectum to avoid injury to autonomic nerves, especially nervi-erigentes and pre sacral venous plexus. Then dissection was done on left side after identifying left ureter and also anteriorly. Dissection was carried out downwards till pelvic floor.

Mesh was placed behind dissected rectum, upper end of mesh is fixed to presacral fascia over sacral promontory using 2- 0 prolene, another stay suture given over lower part of mesh, then mesh fixed on either side of rectum such it covers about 2/3rd of rectum. In both procedures reperitonealised with 2-0 polydioxanone suture covering the mesh.

2. Laparoscopic Ventral rectopexy (LVR)

The procedure was performed in a modified Lloyd Davis position on an antislip mattress. Four ports were used, one optical 10 mm port at the umbilicus, a 10- and 5-mm on the right side, and another 5-mm port in the left iliac fossa.

In the beginning of the procedure, uterus was hitched using a proline stitch on a straight needle. Sacral promontory was identified, and a fold of peritoneum was stretched, and dissection was started with monopolar diathermy on scissors. Once

the incision was made on the stretched peritoneum, CO_2 helps dissecting the tissue planes.

A clearly defined plane preserving the hypogastric nerves can be developed in this way. Dissection was performed in craniocaudal fashion dissecting alongside the right border of the rectum.

Dissection was then extended to open the rectovaginal septum. The back wall of the vagina is identified, and the rectum is retracted to open up the peritoneal fold.

If entered in the right plane, this plane should be avascular and there should be no damage to either the rectum or vagina. No retractors are placed in the pelvis and surgeon's left-hand instrument gives traction on the rectum and moves it to either side as needed. Dissection was continued down right to the perineal body.

At that stage, the level of dissection was assessed by holding the rectum with Johann's graspers and doing a digital rectal examination. The level of dissection should correspond to approximately 3 to 4 cm from the anal verge. A composite mesh with a protective covering on one side and a size of approximately 5 × 15 cm was sutured to the distal end of the anterior rectal wall using four interrupted sutures of 2/0 Ethibond about 1 cm apart. Care was taken to take just enough bites and not to penetrate the rectum to prevent mesh infection. A gentle stretch will be applied on the mesh to pull the rectum and fix the proximal end of the mesh to sacral promontory with tackers. Peritoneum was closed with a running suture of 2/0 polydioxanone suture covering the mesh completely.

Postoperative treatment

The decision to discharge patients was made by the operating surgeon. After surgery all patients were started on intravenous broad-spectrum antibiotics and adequate analgesia. Oral analgesia was started on postoperative day 2. Nasogastric tubes were removed at the end of the operation.

Bladder catheters were removed as soon as possible. Noncarbonated liquids were offered the evening of the surgery. If oral liquids were tolerated, diet was advanced to soft, and thereafter solid food was given. Early mobilization was encouraged and implemented on postoperative day 1. Patients were discharged after having had a bowel movement, tolerating solid food, being able to walk properly, and being made comfortable with oral analgesia.

Deep venous thrombosis prophylaxis using low-molecular weight heparin was continued during the hospital stay.

Discharge criteria included tolerance of three solid meals and passage of flatus or stool.

Data was collected prospectively, including operative time, length of hospital stay, morbidity, and mortality.

Follow-up

All patients were followed up at 6-month intervals in the first year and then annually. Follow-up duration was range from 1 to 2 years. At the time of follow-up, patients were assessed by clinical review and a standardized questionnaire addressing the issues of recurrence (defined as extrusion of full thickness of the wall of the rectum beyond the anal verge determined by clinical examination), constipation, incontinence, and quality of life using the same preoperative scores.

Patients were considered constipated if they had <2 bowel movements per week without using laxatives or enemas. Obstructed defecation was defined as ‘‘difficulty in evacuation or emptying the rectum, which may occur even with frequent visits to the toilet and even with passing soft motions’’.

Study Outcome Measures

The study outcome measures included were:

1. The primary outcome measures were disappearance of prolapse and recurrences.
2. Secondary outcomes- operating time (minutes) calculated from the first skin incision to the application of dressings; estimated blood loss (milliliters) recorded by the anesthesiologist
3. Conversion rate defined as unplanned laparotomy
4. Complications defined as alterations from the ideal postoperative course
5. Quality of Life
6. Hospital stay (days) defined as postoperative days

Study End Point:

The disease investigated in this study is external FTRP. This involved all layers of the rectal wall and was measured while the patient is in the squatting position. The patient was asked to increase straining and the prolapse enlarged and lengthened. The measurement was performed while the patient was straining from the perianal skin to the top of the prolapse. The end point of the study was the rate of recurrent FTRP at 1 year after surgery. Patients were followed up for 2 years; yearly outpatient examinations were performed with the patient in the squatting position. Recurrent FTRP was defined as an external rectal prolapse occurring at any time within the follow-up period after surgery for FTRP. Mucosal prolapse involves only the mucosal layer of the rectum and was therefore not the disease under investigation.

Statistical analysis:

Statistical analysis was performed by IBMSPSS 22 software. Continuous data was presented as means and standard deviations if normally distributed or median and range if not normally distributed. Categorical data presented as frequencies and percentages. Categorical variables were compared using Fisher's exact or the chi-square tests. Continuous variables were compared using the Wilcoxon rank sum test or Mann–Whitney's test. Because of the low number of events per variable, the analysis of risk factors potentially associated with bad continence was done only by means of univariate analysis with unadjusted odds ratios and confidence intervals (no multivariate analysis will be done). For the analysis of differences in preoperative and postoperative scores within the same group, repeated measure analysis of variance (ANOVA) was used. To investigate differences in self-reported bowel motions, obstructed defecation episodes and incontinence episodes, the McNemar's test, which looks at related nominal data, was employed. A regression analysis (analysis of covariance) was done for Wexner constipation scale (WCS), WIS, and GIQOL data by the type of surgery.

Kaplan–Meier method was used to estimate the cumulative incidence of recurrence in each therapy group, and log-rank test was used to compare the two groups. All tests were two tailed and performed at a significance level of .05.

Results:

The overall mean age of the study population was 55.4±14.5. 13 patients were females and 17 were males. Demographic data, age distribution, and preoperative characteristics in both groups are listed in Table 1. 12 patients had a degree of fecal incontinence (WIS q4). Other complaint was constipation (n = 22), bleeding per rectum (n = 6), and obstructed defecation (n = 25). 6 of the 30 women had undergone hysterectomy.

There were only two conversions to open surgery in the LVR group. Mean operative time was significantly longer in LVR (121.5 – 27.8 minutes versus 105.7 – 18.7 minutes; P = .001). Also, mean length of stay was significantly longer in LVR (4.4 days versus 3.5 days; P = .001). Estimated blood loss was minimal in both groups. No patient in either group was readmitted due

to surgical complications. Operative results are listed in Table 2.

There was no postoperative mortality. Postoperative complications are listed in Table 3.

Thirty-day postoperative morbidity was not significantly different between both groups, P = .99. Prolapse disappeared in all patients after surgery. Recurrences were reported in 1 patient in each group over a mean follow-up period of 46 months (range 24–84 months). A Kaplan–Meier method with log rank test showed no significant difference in recurrence between both groups, P = .93. Perineal descent improved >50% in defecogram 6 months postoperatively in 77% in LVR versus 21% in LWR. Functional results are shown in Tables 4 and 5. In LVR, 23 patients complained of constipation preoperatively, 50% of them reported improvement of their bowel frequency and none complained of worsening or de novo constipation. In the LWR group, 25 patients had preoperative constipation, only 23% experienced improvement of their symptoms. Obstructed defecation and incontinence symptoms improved significantly in both groups (Table 4).

Table 1: Demographic and Clinical Data of Patients in Both Study Groups

Variable	Whole group n=30	Group A (LVR) n = 15	Group B (LWR) n = 15	P value
Mean age (years)	55.4±14.5	57.8±13.6	53.5±18.5	0.23
Sex				
Male	17	10	7	0.12
Female	13	5	8	
ASA score				
I	14	5	9	0.44
II	9	6	3	
III	7	4	3	
Fecal incontinence (WIS >4)	12	7	5	0.35
Constipation (WCS >8)	22	10	12	0.63
Bleeding per rectum	6	4	2	0.55
Obstructed defecation	25	16	9	0.72
Hysterectomy	6	3	3	0.80
Anal surgery	8	5	3	0.98
Others	4	3	1	NA
Abnormal perineal descent	27	18	9	0.41

Table 2: Operative Results of Patients in Both Study Groups

	Laparoscopic Ventral Rectopexy (15)	Laparoscopic Wells Rectopexy (15)	P value
OR time (minutes)	121.5 – 27.8	105.7 – 18.7	0.001*
Conversion	2	0	0.57
Morbidity	1	2	0.84

Table 3: Postoperative Morbidity

	Laparoscopic Ventral Rectopexy	Laparoscopic Wells Rectopexy
Urinary retention	0	1
Urinary tract infection	4	0
Wound infection	0	1
Prolonged ileus	2	1
Mesh erosion in vagina	1	0

Table 4: Changes in the Clinical Symptoms after Surgery

	Laparoscopic Ventral Rectopexy			Laparoscopic Wells Rectopexy			P value
	Peroperative	1 Year	Pa	Peroperative	1 Year	Pa	
Bowel motions <2/week	23	10	<.0001	18	12	0.72	0.45
Incontinence	16	4	<.0001	10	3	<.0001	<0.001*
Obstructed defecation	25	7	<.0001	20	10	<.0001	<0.001*
Abnormal perineal descent	21	3	<.0001	11	7	0.23	0.70

Discussion:

Higher preoperative WIS, abnormal perineal descent, and age >70 years proved to be predictive factors for poor outcome as regard to continence. Discussion Laparoscopic rectopexy has been demonstrated to be as effective as open rectopexy in treatment of complete rectal prolapse and associated with a low recurrence rate. There are significant reductions in postoperative pain, hospital length of stay, recovery time, and complications compared to open abdominal rectopexy. [7, 12] In this study, we compared two laparoscopic rectopexy techniques: LWR and LVR. The comparison included operative parameters, morbidity, hospital length of stay, postoperative improvement in fecal incontinence, changes in constipation status, and recurrence. We found that operative time was significantly shorter in LWR compared to LVR (105 minutes versus 121 minutes, P < .001). Also, hospital length of stay was significantly shorter in LWR (3.5 days versus 4.4 days; P = .001). Complications occurred in 8% of patients in LVR and in 7% in LWR (P= .99).

In their systematic review, Samaranayake et al. [12] reported complication rates in LVR ranging from 1.4% to 47%. On the other hand, complication rates reported after LWR ranged from 0% to 20%. [14-17] The fact that 45% of our patients had an ASA score of 2 or 3 indicates that both techniques are safe in patients with comorbidities. The risk of mesh erosion into the rectum or vagina although very rare was of concern and was explained to our patients before surgery. Mesh erosion into the vagina was reported in 1 LVR patient after 13 months. Many publications have reported mesh erosion into the rectum [18] or posterior vaginal wall. [19] The overall rate of reported erosion after mesh rectopexy ranged between 1% and 5%. [20-21] Factors that were found contributing to poor wound healing and subsequent infection, erosion, include uncontrolled diabetes mellitus, smoking, and previous pelvic irradiation. [22] Moreover, some surgical technical errors like unrecognized vaginal injury during

dissection or bigger sized mesh that folds after fixation might be possible causes for erosion. [23] Having optimum size of the mesh to avoid folding and confirmation of intact wall of vagina by methylene blue injection might help to avoid this complication. Disappearance of prolapse and recurrence rate was considered the milestones in judging the success of the procedures. In this study, prolapse disappeared after surgery in all patients. The recurrence rate was 2.7% (2.4% in LVR versus 3.1% in LWR) at mean follow-up period of 46 months. Boons et al. [24] reported 2% recurrences after LVR after a median follow-up of 19 months. Many reports on the Wells procedure reported no recurrences, [7,10] yet others reported recurrence rates between 1%21 and 10%. [25]

We think that old age with possible weak pelvic floor muscle might push the recurrence a bit high. Incontinence associated with complete rectal prolapse is attributed to sphincter dilation, intermittent activation of the rectoanal inhibitory reflex by the prolapsed rectal bolus, and pudendal nerve neuropathy due to nerve traction by the prolapse. In this study, there was significant postoperative improvement of fecal incontinence. Dulucq et al. [26] reported similar results in their LWR patients. Formijne Jonkers et al. reported improvement in fecal incontinence after LVR from 59% preoperative to 14% postoperative. [8] A systematic review of ventral rectopexy reported that improvement in the fecal incontinence score after LVR ranged from 45% to 95% in short-term follow-up. [12] The mechanism of recovery of continence following rectopexy remains undetermined. It might be due to correction of chronic strain on the pudendal nerve, improvement of rectal compliance, or abolition of high-pressure rectal waves. [12, 26] Obstructed defecation symptoms were improved significantly in both groups. These results coincide with many series that reported a significant reduction of obstructed defecation symptoms after rectopexy. [27,28]. In this study, there were 51% improvements in preexisting constipation after LVR. In concordance with our results, D'Hoore et al. reported improving constipation in 83%, with no severe worsening or new onset of constipation after LVR. [29] After LWR, the improvement of constipation in this study was 20%. Analysis of covariance showed that the improvement of constipation after LVR was significantly higher than LWR. Finally, GIQOL improved after both procedures denoting that both procedures are satisfactory for the patients. However, the improvement was significantly higher after LVR. This might be due to more improvement in the constipation score and perineal descent. Limitations of this study include selection bias as it was retrospective. The possible selection bias was eliminated by including all patients who had LWR or LVR during the study period. [30]

Conclusion:

In this study, both LVR and LWR successfully and safely corrected the prolapse and prevented recurrence in patients after long-term follow-up. Operative time and hospital length of stay are significantly shorter in LWR. High incontinence scores and age >70 are potential predictors of bad continence postoperatively. LVR appears to be more suitable for patients with a high constipation score and abnormal perineal descent.

References:

1. Tou S, Brown SR, Malik AI, Nelson RL. Surgery for complete rectal prolapse in adults. Cochrane Database Syst Rev 2008;(4):CD001758.
2. Habr-Gama A, Jacob CE, Jorge JM, et al. Rectal procidentia treatment by perineal rectosigmoidectomy combined with levatorani repair.

Hepatogastroenterology 2006;53: 213–217.
3. Lieberth M, Kondylis LA, Reilly JC, Kondylis PD. The Delorme repair for full-thickness rectal prolapse: A retrospective review. Am J Surg 2009; 197:418–423.
4. Senagore AJ, Madbouly KM, Fazio VW, Duepree HJ, Brady KM, Delaney CP. Advantages of laparoscopic colectomy in older patients. Arch Surg 2003; 138:252–256.
5. Delaney CP. Laparoscopic management of rectal prolapse. J Gastrointest Surg 2007; 11:150–152.
6. Nunoo-Mensah JW, Efron JE, Young-Fadok TM. Laparoscopic rectopexy. Surg Endosc 2007; 21:325–326.
7. Madbouly KM, Senagore AJ, Delaney CP, Duepree HJ, Brady KM, Fazio VW. Clinically based management of rectal prolapse. Surg Endosc 2003; 17:99–103.
8. Formijne Jonkers HA, Maya A, Draaisma WA, et al. Laparoscopic resection rectopexy versus laparoscopic ventral rectopexy for complete rectal prolapse. Tech Coloproctol 2014; 18:641–646.
9. Senagore AJ. Management of rectal prolapse: The role of laparoscopic approaches. Semin Laparosc Surg 2003;10: 197–202.
10. Akira Tsunoda. Surgical Treatment of Rectal Prolapse in the Laparoscopic Era, A Review of the Literature. Journal of the anus, rectum and colon. 2020: 4-3.
11. Hernandez P, Targarona EM Balague C, et al. [Laparoscopic treatment of rectal prolapse]. Cir Esp 2008; 84:318–32.
12. Solomon MJ, Young CJ, Eyers AA, Roberts RA. Randomized clinical trial of laparoscopic versus open abdominal rectopexy for rectal prolapse. Br J Surg 2002; 89:35–39.
13. Lundby L, Iversen LH, Buntzen 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):291-297.
14. Samaranayake CB, Luo C, Plank AW, Merrie AE, Plank LD, Bissett IP. Systematic review on ventral rectopexy for rectal prolapse and intussusception. Colorectal Dis 2009; 12:504–512.
15. Dulucq JL, Wintringer P, Mahajna A. Clinical and functional outcome of laparoscopic posterior rectopexy (Wells) for full-thickness rectal prolapse. A prospective study. Surg Endosc 2007; 21:2226–2230.
16. Kohler A, Athanasiadis S. The value of posterior levator repair in the treatment of anorectal incontinence due to rectal prolapse—A clinical and manometric study. Langenbecks Arch Surg 2001; 386:188–192.
17. Michalopoulos A, Papadopoulos VN, Panidis S, et al. Surgical management of rectal prolapse. Tech Coloproctol 2011;15Suppl 1: S25–S28.
18. Faucheron JL, Voirin D, Riboud R, Waroquet PA, Noel J. Laparoscopic anterior rectopexy to the promontory for full thickness rectal prolapse in 175 consecutive patients: Shortand long-term follow-up. Dis Colon Rectum 2012; 55:660–665.
19. Portier G, Iovino F, Lazorthes F. Surgery for rectal prolapse: Orr-Loygue ventral rectopexy with limited dissection prevents postoperative-induced constipation without increasing recurrence. Dis Colon Rectum 2006; 49:1136–1140.
20. Mathew MJ, Parmar AK, Reddy PK. Mesh erosion after laparoscopic posterior rectopexy: A rare complication. J Minim Access Surg 2014; 10:40–41.
21. Wu JM, Wells EC, Hundley AF, Connolly A, Williams KS, Visco AG. Mesh erosion in abdominal sacral colpopexy with and without

concomitant hysterectomy. Am J Obstet Gynecol 2006; 194:1418–1422.
22. Nazemi TM, Kobashi KC. Complications of grafts used in female pelvic floor reconstruction: Mesh erosion and extrusion. Indian J Urol 2007; 23:153–160.
23. Nivatvongs S, Young-Fadok TM. Rectal prolapse: Abdominal approach. In: Fischer JE, Bland KI (eds). Mastery of Surgery, 5th ed. II. Philadelphia: Lippincott Williams & Wilkins, 2007, pp. 1582–1590.
24. Boons P, Collinson R, Cunningham C, Lindsey I. Laparoscopic ventral rectopexy for external rectal prolapse improves constipation and avoids de novo constipation. Colorectal Dis 2009; 12:526–532.
25. Tomohide Hori, Daiki Yasukawa, Takafumi Machimoto, Yoshio Kadokawa, Toshiyuki Hata, Tatsuo Ito, Shigeru Kato, Yuki Aisu, Yusuke Kimura, Yuichi Takamatsu, Taku Kitano, Tsunehiro Yoshimura. Surgical options for full-thickness rectal prolapse current status and institutional choice. Annals of Gastroenterology (2018) 31, 1-10.
26. Dulucq JL, Wintringer P, Mahajna A. Clinical and functional outcome of laparoscopic posterior rectopexy (Wells) for full-thickness rectal prolapse. A prospective study. Surg Endosc 2007; 21:2226–2230.
27. Margute, T. G., Ferreira, P. C., Almeida, I. M. M., Denardin, C., Silva, T. Q. M. da, Margute , T. G., Maione, M. S., Rossato, A. R., & Santos, I. F. dos. Use of tricyclic antidepressants in trigeminal neuralgia. Journal of Medical Research and Health Sciences, 2022:5(5), 2008–2012.
28. Auguste T, Dubreuil A, Bost R, Bonaz B, Faucheron JL. Technical and functional results after laparoscopic rectopexy to the promontory for complete rectal prolapse. Prospective study in 54 consecutive patients. Gastroenterol Clin Biol 2006; 30:659–663.
29. Douard R, Frileux P, Brunel M, Attal E, Tiret E, Parc R. Functional results after the Orr-Loyguetrans abdominal rectopexy for complete rectal prolapse. Dis Colon Rectum 2003; 46:1089–1096.
30. D'Hoore A, Cadoni R, Penninckx F. Long-term outcome of laparoscopic ventral rectopexy for total rectal prolapse. Br J Surg 2004; 91:1500–1505.