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Original Article

Early functional outcomes of laparoscopic ventral mesh rectopexy in obstructed defecation syndrome: Case series

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Abstract

Aim: Laparoscopic ventral mesh rectopexy (LVMR) has gained popularity in the treatment of obstructed defecation syndrome (ODS)-related morphological disorders of the pelvic floor. The aim of this study is to investigate the effectiveness, safety and early functional results of the LVMR, especially in ODS-related disorders.

Materials and Methods: Data of patients who underwent LVMR between May 2019 and December 2020 were retrospectively analyzed. Demographic characteristics, comorbid diseases, presence of previous abdominal surgery, proctological examination findings, dynamic magnetic resonance defecography results, anal manometer results, early and late complications, postoperative length of hospital stay of patients were recorded. Wexner Incontinence Score (WIS) and Wexner Constipation Score (WCS) were used in the preoperative and postoperative third month to evaluate the functional recoveries of patients.

Results: Of 14 patients, one was man (7.1%) and 13 were women (92.9%). The mean age of the patients was 43.71 ± 11.72 years (range 24-61). Mean length of follow-up was 11.14 ± 4.52 months (range 4-19). Three (21.43%) of the patients had external rectal prolapse and 11 (78.57%) had ODS-related rectocele. In these 11 patients with ODS, the mean preoperative and postoperative WCS were 15.81 ± 3.68 (range 11-24) and 7.45 ± 3.24 (range 4-14), respectively, indicating a statistically significant difference ($p< 0.001$).

Conclusion: LVMR is a safe procedure if performed with a selective approach after a thorough preoperative evaluation in ODS patients and a remarkable level of functional recovery can be achieved in these patients, particularly in the postoperative early period.

Keywords: Obstructive defecation; rectocele; ventral mesh rectopexy

INTRODUCTION

Obstructed defecation syndrome (ODS) has severe adverse effects on quality of life. These patients have a functional defecation defect combined with anatomical disorders of the pelvic floor such as rectocele, enterocele, peritoneocele or internal rectal prolapse (1). Despite all conservative treatments, almost 20% of ODS patients require surgical treatment (2).

Laparoscopic ventral mesh rectopexy (LVMR), described by D'Hoore et al. in 2004, has almost become the standard approach in external rectal prolapse surgery in Europe and Northern America due to its superior results in terms of new-onset constipation after rectal prolapse surgery (3,4). The most important advantage of the LVMR is that posterior mobilization of the rectum is not required and constipation caused by rectal denervation can be prevented by protecting the autonomic nerves (3-6).

The use of LVMR in morphological disorders of pelvic compartment (rectocele, intussusception, enterocele, peritoneocele, sigmoidocele and pelvic floor failure) in addition to external prolapse treatment, has become increasingly common (4,6-8). The technique is based on fixing a synthetic mesh that both strengthens the rectovaginal septum and treats prolapse by hanging the rectum and pelvic floor between the anterior wall of the rectum and the sacral promontorium.

Recent reports suggest that LVMR provides 70-90% improvement for incontinence and 60-80% improvement for constipation thus encouraging to become an important alternative in the surgical treatment of ODS, the most important component of which is functional constipation (6,7). The presence of patients for whom functional improvement cannot be achieved, successful results still makes the issue of selecting patients who will benefit from LVMR and expectations controversial (6,7,9).

In this study, we aimed to investigate the effectiveness, safety and early functional results of LVMR, particularly in ODS-related disorders, for which there are still limited number of series in our country presented.

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MATERIALS and METHODS

Prospectively recorded data of patients who underwent LVMR between May 2019 and December 2020 were retrospectively analyzed. Patients' medical history, symptoms, physical examination findings and radiological results were evaluated together before deciding surgical treatment. All patients underwent colonoscopy or rectosigmoidoscopy. No additional radiological examination was performed for patients with external rectal prolapse. However, all patients with ODS who were found to have rectocele and/or internal rectal prolapse during proctological examination, were evaluated by a dynamic magnetic resonance (MR) defecography. Anorectal manometer was performed on patients with fecal incontinence. Conservative treatment was favoured for patients diagnosed with ODS for at least three months (such as a fiber diet, increased physical activity, regulation of toilet habits, bulking laxatives, etc.). High-grade rectocele patients who did not respond to conservative treatment and patients who had enterocele, peritoneocele or intrarectal intussusception as a result of MR defecography underwent surgery.

Demographic characteristics (age and gender), comorbid diseases, presence of previous abdominal surgery, proctological examination findings, dynamic MR defecography results, anal manometry results, early (first 30 days) and late complications, postoperative length of hospital stay were recorded. Wexner incontinence score (WIS) and Wexner constipation score (WCS) were used in the preoperative and postoperative third month to assess the functional recovery of patients (10,11).

All procedures performed in this study are in accordance with the ethical standards of the institutional and/or national research committee and the 1964 Helsinki Declaration and its later amendments or comparable to the ethical standards. This study was approved by the local ethical committee (reference: 22.02.21/193).

Surgical Technique

After mechanical bowel cleansing, all patients were operated under general anesthesia, in the Lloyd-Davies position. Carbon dioxide pneumoperitoneum was provided by entering through superior of the umbilicus with Veress needle. A 10 mm diameter trocar was used for camera, inserted from the same point. Under direct camera view, one 10 mm trocar was placed from the right iliac fossa and two 5 mm diameter trocars over the right and left midclavicular lines, in a way to form a parabola whose opening faces the pelvis. In female patients, a suture was passed through the uterus seromuscularly and taken out of the abdomen for uterine retraction in order to achieve a better vision. Dissection was initiated with a superficial peritoneal incision at the level of the sacral promontorium. The incision was deepened into the right pararectal plane and extended to the left of the Douglas pouch. The rectovaginal septum was dissected down to the pelvic floor muscles. Polyglactin-polypropylene composite mesh (Vypro II, Ethicon, USA) was placed along the anterior wall of the rectum, starting from the deepest part of the dissection plane (Figure 1). The mesh was fixed to the rectum wall using four polydioxanone sutures in the distal and two polydioxanone sutures in the right lateral planes. The proximal end of the mesh was fixed to the promontorium using a five mm helical fastener stapler (Protac, Covidien, Minneapolis, USA) (Figure 2). The peritoneum was closed with absorbable suture (V-Loc, Medtronic, USA) to narrow the Douglas pouch. No drains were used in any patients.

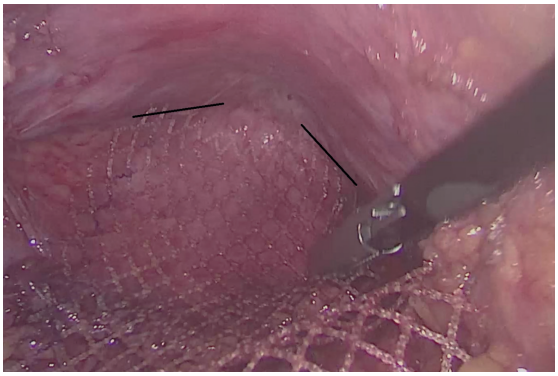

Figure 1. Placement of the 15 x 3 cm composite mesh starting from the pelvic floor along the anterior rectal wall

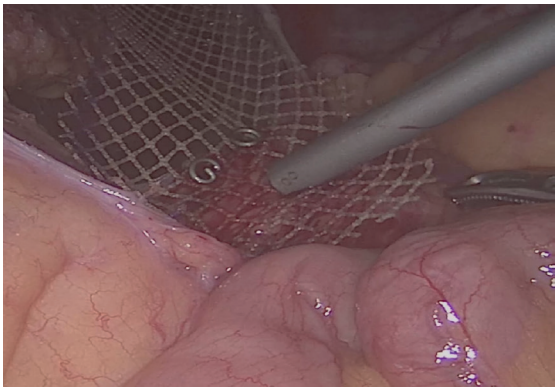

Figure 2. Fixing the proximal end of the composite mesh to the promontorium with nonabsorbable tacks

Statistical Analysis

All data were transferred to computer environment and SPSS 20.0 software (SPSS Inc., Chicago, IL, USA) was used for statistical analysis. Relevant variables were analyzed using descriptive statistics. Categorical measurements were given as numbers and percentages, while continuous measurements were given as mean ± standard deviation and range. Preoperative and postoperative WCS were compared by means of Paired Sample t-test. The significance level for all analysis was considered as 0.05.

RESULTS

Of 14 patients, one was man (7.1%) and 13 were women (92.9%). The mean age of the patients was 43.71 ± 11.72 years (range 24-61). Mean length of follow-up was 11.14 ± 4.52 months (range 4-19). Three (21.43%) of the patients had external rectal prolapse and eleven (78.57%) patients had ODS-related rectocele, during the proctological examination. No patients developed early or late complications. Demographic, physical examination and surgical characteristics of the patients are presented in Table 1.

Table 1. Demographic, physical examination and surgical characteristics of the patients

Characteristic	Value
Age (year) (mean ± SD*, range)	43.71 ± 11.72 (24-61)
Sex	
Man	1 (%7.1)
Woman	13 (%92.9)
Previous abdominal surgery, n (%)	
Physical examination, n (%)	
Rectocele	7 (%50)
Rectocele + perineal desensus	4 (%28.6)
External rectal prolapse	3 (%21.4)
Comorbid disease, n (%)	
Diabetes mellitus	5 (%35.7)
Hypertension	3 (21.4)
Coronary artery disease	1 (%7.1)
Asthma	2 (%14.3)
Others	4 (%28.6)
ASA score, n (%)**	
ASA 1	2 (%14.3)
ASA 2	8 (%57.1)
ASA 3	4 (%28.6)
ASA 4	0
Length of hospital stay (day) (mean ± SD*, range)	1.14 ± 0.36 (1-2)
Early complication (first 30 days), n (%)	0
Follow-up (month) (mean ± SD*, range)	11.14 ± 4.52 (4-19)

*SS: standard deviation, **ASA: American Society of Anesthesiologists

Table 2. Relationship of physical examination, dynamic magnetic resonance defechography and anal manometer results

Demography (age, sex)	Physical examination	Dynamic MR Defectography	Anorectal Manometry
34, man	Rectal prolapse	(-)	Decreased MBP and MSB
39, woman	Rectal prolapse	(-)	Decreased MBP and MSB
57, woman	Rectal prolapse	(-)	Significantly decreased MBP, decreased MSB
48, woman	Rectocele	Rectocele	(-)
54, woman	Rectocele	Rectocele, pelvic relaxation	(-)
30, woman	Rectocele	Rectocele, pelvic relaxation	(-)
24, woman	Rectocele	Rectocele, pelvic relaxation	(-)
43, woman	Rectocele	Rectocele, distal intrarectal intussusception	(-)
32, woman	Rectocele	Rectocele, distal intrarectal intussusception, peritoneocele	(-)
38, woman	Rectocele	Rectocele, pelvic relaxation, enterocele and peritoneocele	(-)
40, woman	Rectocele, perineal desensus	Rectocele, distal intrarectal intussusception, peritoneocele	(-)
61, woman	Rectocele, perineal desensus	Rectocele, distal intrarectal intussusception, enterocele, peritoneocele	(-)
58, woman	Rectocele, perineal desensus	Rectocele	(-)
54, woman	Rectocele, perineal desensus	Rectocele, advanced pelvic descent	(-)

MR: magnetic resonance; MBP: maximal basal pressure; MSP: maximal squeeze pressure

Anorectal manometer was performed on three patients who described fecal incontinence. A decrease in maximal basal pressure and maximal squeeze pressure were detected in these patients. Physical examination, dynamic MR defecography and anorectal manometer results for each patient are presented separately in Table 2. The mean preoperative WIS was 12 (range 8-18), which reduced to 2.66 (range 0-6) in the postoperative third month. In 11 patients with symptoms of ODS, the mean preoperative WCS was 15.81 ± 3.68 (range 11-24), while the postoperative mean was 7.45 ± 3.24 (range 4-14) (Figure 3). A significant difference was detected between preoperative and postoperative WCS (p< 0.001) (%95 confidence interval [CI] 6.53 to 10.2).

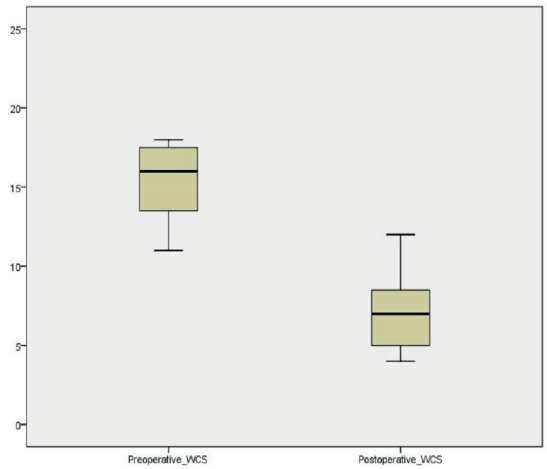

Figure 3. Preoperative and postoperative Wexner Constipation Score (WCS) in patients with rectocele combined with Obstructed Defecation Syndrome (ODS)

DISCUSSION

Most of the series presented on LVMR results cover patients who have been operated due to external rectal prolapse. Asian and Eastern countries have more limited data on the application of LVMR in the treatment of ODS-related pelvic floor disorders, in particular rectocele (4,8). Rectocele or an anatomic disorder related to pelvic floor failure co-existing with rectocele was found in 78.57% of the patients in this study.

In LVMR, after ventral dissection along the rectovaginal septum, strengthening this area with mesh enables effective repair of the supra-anal rectocele. Moreover, this strengthening also creates a preventive barrier for anterior recto-rectal intussusception (4,6). Fixation of mesh to promontorium creates a resistance against pelvic descensus that becomes more pronounced during defecation, beyond contributing to stability of pelvic floor. One of the most important advantages of the technique is that it minimizes the risk of rectal denervation due to the lack of posterior and lateral dissection (3-6,12). A surgical approach that will cause worsening constipation is unacceptable, while difficult and incomplete evacuation is already a major problem in the ODS patient group.

No complications developed in any of the patients in our study. One of the leading complications in literature related to the technique is mesh-related problems. Mesh erosion was reported between 1.2-2%, and mesh dislocation was reported at a rate of 4% (6,13,14). In a 312-case series, 1.9% intrarectal mesh migration was reported (15). Since the mean length of follow-up in our series is less than one year, it would be unwise to make a judgment in terms of mesh-related complications for our patients. As a matter of fact, it was emphasized that these complications generally tend to occur after the first postoperative year (16). In a multicenter collaborative study involving 2203 patients, the median time for the occurrence of mesh erosion was reported as postoperative 23 months (14).

There is an endless search for the most ideal mesh in every field where mesh is used in surgery. Although biological graft appears to have an advantage in terms of erosion in patients using synthetic mesh and biological graft in ventral rectopexy (2.4% vs. 0.7%), there is not enough evidence-based data on ideal mesh selection (14,17). Although we did not encounter a study in the literature comparing synthetic mesh varieties for LVMR, we preferred to use composite mesh in all our patients. In this way, we aimed to both maintain mechanical resistance and reduce the amount of foreign material remaining in the patient.

One of the interesting results of our study is that a secondary pelvic floor problem was identified as a result of dynamic MR defecography in nine (81.82%) of 11 patients with rectocele. In pelvic floor disorders, internal rectal prolapse, also called rectal intussusception, has been reported between 12-27% and enterocele between 17-37% (18). Dynamic MR defecographic examination showed 36.36% intussusception and 36.36% peritoneocele-enterocele in rectocele patients in our series. This result confirms studies stating that the use of dynamic MR defecography compared to conventional proctography is superior in the identification of pathologies accompanying rectocele in ODS (18,19). Dynamic MR defecography is also very effective in revealing multicompartment pelvic prolapse. LVMR is a procedure that allows anatomical repair in multiple pelvic compartments. Although not included in our series, it also enables colpopexy with posterior vaginal vault suspension (4,6,12).

It has been reported that the mean hospital stay after LVMR can reach up to 7.1 days (6). Length of hospital stay in our study was 1.14 days on average, which supports that LVMR can be applied as a same day discharge procedure (20). Uncertainty about which ODS patients will benefit from LVMR has prompted researchers to focus on this issue. Although there is no algorithm yet for patient selection, it is stated that patients with significant perineal descent and a denervated pelvic floor do not respond to LVMR (21). Advanced pelvic descent in only one of our patients may have contributed achieving a significant improvement in WCS in our series.

There are differences between early and late period functional results of LVMR. It has been reported that functional recovery in defecation achieved in the early postoperative period in almost all patients with ODS cannot

be maintained in the late period in one-third of these patients (22). Although anatomical repair in rectocele and enterocele has been shown to be effective and complete, it is notable that a group of patients have lost the initial functional recovery response. It is also known that symptoms, physical examination, and radiological results in ODS patients do not always correlate (4). On the other hand, it has been shown that even a factor such as slow transit constipation does not affect the functional results of LVMR (23).

Many different techniques have been described in surgical treatment of rectocele, such as transanal, transperineal, transvaginal, and transabdominal approaches. However, there is no consensus on which surgical method to choose. This situation generally depends on the experience of the surgeon and the treatment plan of diseases associated with or accompanying rectocele (24). Our patients selected for surgery were the ones with severe symptoms, resistant to conservative treatment, high-grade rectocele or other pelvic floor problems that accompany rectocele. However, we should also note that in our series, there was a patient whose WCS score did not decline to the extent we expected after LVMR and symptomatic improvement could not be achieved despite anatomical improvement. These results indicate how complex the mechanisms underlying ODS are, and there are still uncertainties in patient selection for LVMR.

LIMITATIONS

The most important limitations of the study are the number of patients and the retrospective design. The variability of long-term results of LVMR and the limitation of the data on this subject make prospective studies valuable and necessary, in which the length of follow-up is much longer. Among the ODS patient group, it is difficult to identify suitable candidates for LVMR, and it may be useful to standardize dynamic MR defecography and adopt a multidisciplinary approach specific to the pelvic floor.

CONCLUSION

In conclusion, although there are some concerns about long-term results, LVMR is a safe procedure if performed with a selective approach after effective preoperative evaluation in ODS patients. A remarkable level of functional recovery can be achieved in these patients, especially at the postoperative early period.

Competing Interests: The authors declare that they have no competing interest.

Financial Disclosure: There are no financial supports.

Ethical Approval: This study was approved by The Local Ethical Committee of Gazi University Faculty of Medicine (reference: 22.02.21/193).

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