Short term functional and sexual outcomes after laparoscopic ventral mesh rectopexy for complex anterior rectocele

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Abstract

Background: Anterior rectocele is a quite common problem in multiparous women, which requires surgery after failure of conservative measures. Laparoscopic ventral mesh rectopexy (LVMR) has been adopted as a line of treatment, with questionable outcomes. The current study aims to report the efficacy of LVMR in the treatment of anterior rectocele and its short term functional outcomes. **Methods:** Fifteen female cases were included in the current prospective cohort study, which was conducted in the colorectal surgery department of Mansoura University Hospital from February 2021 to July 2022. All patients underwent LVMR. Patients were evaluated preoperatively and postoperatively by using the Cleveland Clinic Constipation Score (Wexner score) and the short form of the Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire (PISQ-12). **Results:** The median age was 42(35-50) years. The mean body mass index (BMI) was 31.1±3.4 kg/m^2. The median duration of obstructive defecation symptoms was 3(2-4) years. The mean size of rectoceles in defecography was 5±1cm. The median follow up was 14(11-18) months. The mean Wexner constipation score showed a significant decrease at 12 months of follow up (16.7±3.2 (preoperative) vs. 10.4±2.3; P<0.001). After 12 months of follow up, the mean PISQ-12 score improved significantly 24.4±3.2 (preoperative) vs. 14.7±3.6; P=0.04). No mesh related complications were reported. **Conclusion:** LVMR is a safe procedure for complex rectocele with comparable functional outcomes. Obstructive defecation symptoms and sexual function showed significant improvement after 1 year of follow up. Nevertheless, long-term follow-up data is needed.

Key words: Rectocele, Ventral mesh rectopexy, obstructive defecation syndrome, constipation, Sexual function.

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Introduction:

Anterior rectocele is the rectal protrusion across the rectovaginal fascia or posterior vaginal wall, causing obstructive defecation symptoms. It is more common in the elderly or multiparous [1]. On the other hand, up to 93% of healthy females are found on defecating proctography to have radiological evidence of asymptomatic rectocele [2].

Surgery is typically indicated by symptoms rather than radiographic proof of an anatomical abnormality. Usually 30-70% of cases present with one or more of these symptoms, which negatively impact their quality of life (QoL); significant rectal emptying difficulties, straining at defecation, the requirement for perineal or vaginal digitation, and local manifestations which include vaginal bulging and pelvic heaviness [3]. Failed conservative treatment requires surgery to restore normal anatomy and function [4]. The available surgical treatment options for rectocele are trans-anal approach, stapled trans-anal rectal resection (STARR), trans-vaginal repair, trans-perineal repair, and ventral mesh rectopexy. The ideal surgical strategy for treating complex rectocele remains a topic for debate, with the transanal, transperineal, and transvaginal approach and the abdominal approach being in conflict with each other [5]. While transvaginal repair is more popular among gynecologists, the trans-abdominal approach has become increasingly common among colorectal surgeons, due to the rising demand for minimally invasive surgery [6].

Hence, in the context of rectoceles and ODS management, the laparoscopic method has recently come to light as a promising alternative [7]. Laparoscopic ventral mesh rectopexy (LVMR) was originally described in the context of rectal prolapse management [8]. In addition, it was recommended with encouraging results for the treatment of major symptomatic rectoceles [6, 9-12].

The present study aims to assess the safety and efficacy of LVMR for complex anterior rectocele as regard postoperative complications and short term functional outcomes.

Methods:

This is a prospectively collected cohort of 15 female cases who underwent LVMR for

symptomatic complex rectocele in the colorectal surgery department of Mansoura University Hospital from February 2021 to July 2022. Approval from the Institutional Research Board of Mansoura Faculty of Medicine, Egypt was obtained **(IRB No. MD.21.05.479)**, and it was registered in the clinical trials registry with registration number **(NCT05894226)**.

Eligibility criteria: We included multiparous female patients aged between 30 and 60 years who were diagnosed with complex anterior rectocele-more than 3 cm) after failed medical treatment-with a history of either vaginal delivery or cesarean section. Rectocele was described as any hernial protrusion of the anterior rectal wall into the vagina, whereas a complex rectocele was one having any of the next features: size > 3 cm in diameter, associated enterocoele or internal rectal prolapse [13]. Patients complaining of paradoxical contraction of the puborectalis muscle (anismus), complete external rectal prolapse, fecal incontinence, other benign anal conditions, and those who are unfit for surgery due to associated severe comorbidities were excluded.

Preoperative evaluation: All patients were evaluated by regular conventional defecography, and the results were assessed by a radiologist and a coloproctologist. To rule out slow-transit constipation or dyssynergic defecation, respectively, colonic transit time and anorectal manometry were done.

Surgical technique: The surgery was conducted laparoscopically by one constant team of surgeons. The LVMR approach was carried out in agreement with the original approach described by D'Hoore et al. [8]. Under general anesthesia, with the cases placed in Lloyd-Davies position with a steep reverse Trendelenburg position, peritoneal incision was performed beginning at the sacral promontory, and descends downwards in a reversed J form over the Douglas pouch. The rectovaginal septum was broadly opened downwards to reach the pelvic floor. Rectal mobilization was avoided. Rectopexy was carried out by utilizing a 3×15cm strip of a large-pore, monofilament soft polypropylene mesh. The mesh was affixed to the ventral aspect of the distal rectum, the lateral seromuscular border of the rectum, and the pelvic floor on both rectal sides using 2-0 polyester sutures. Then, the mesh was affixed to the sacral promontory by utilizing 2-0 polyester sutures and 5mm permanent tacks. Lastly, the peritoneum was closed over the mesh by utilizing 2-0 Vicryl sutures.

Functional outcomes assessment and patients' interview: Patients were evaluated by one of the authors at regular visits in the outpatient clinic using the Cleveland Clinic Constipation Score (CCCS) (Wexner score) [14] and the short form of the Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire (PISQ-12) [15]. The postoperative scores were compared with the pre-operative ones.

Statistical analysis: The data were analyzed by SPSS (version 21, UK, Bristol). Continuous data was expressed as mean± standard deviation (SD), median, and range based on normality. Categorical variables were expressed as numbers and percent. The Pearson correlation test was used to compare the changes in the preoperative and postoperative functional scores. P-value of < 0.05 was considered statistically significant.

Results:

The present study comprised 15 female patients with a median age of 42(35-50) years. The mean body mass index (BMI) was 31.1±3.4 kg/m^2. Two patients (13.3%) had hypertension; one patient (6.7%) had type II diabetes; and one patient (6.7%) complained of bronchial asthma.

All cases presented with obstructive defecation syndrome (ODS), with a median duration of 3(2-4) years. The median number of previous vaginal deliveries was 2 (1-4). Two patients (13.3%) had a previous cesarean section. The mean size of the rectocele in defecography was 5±1 cm **(Table 1).** Additionally, nine patients (60%) had associated grade III and IV internal rectal prolapse (IRP), while three patients (20%) had grade II IRP and three patients (20%) had enterocele.

The mean preoperative Wexner constipation score (CCCS score) was 16.7±3.2, whereas the mean preoperative PISQ-12 score was 24.4±3.2.

The median surgical time was 200(180-230) minutes. The median length of hospital stay was 4(3-5) days. Apart from two patients (13.3%) who presented with postoperative ileus and two patients (13.3%) who developed urinary tract infections (UTI), there were no other recorded postsurgical complications. No mesh related complications have been reported.

Table (1) Patients' demographics

Variables	**Patients (n=15)**
Age(years)(Median±IQR)	42(35-50)
BMI (kg/m2) (Mean±SD)	31.3±3.4
Comorbidities, n (%)	
Type II DM	1(6.7%)
HTN	2(13.3%)
Bronchial asthma	1(6.7%)
Surgical history	

Previous CS	2(13.3%)
Appendectomy	1(6.7%)
Duration of symptoms(years)(Median±IQR)	3(2-4)
Size of rectocele(cm) (Mean±SD)	5±1
Number of vaginal deliveries (Median±IQR)	2(1-4)
Operative time (min)(Median±IQR)	200(180-230)
Complications, n (%)	
Early	2(13.3%)
Ileus	2(13.3%)
UTI	
Late	0
Mesh erosion	1(10%)
Dyspareunia	4(3-5)
Hospital stay (days) (Median±IQR)	
Follow up (months) (Median±IQR)	14(11-18)
Recurrence rate, n (%)	0

BMI: Body mass index, **DM:** diabetes mellitus; **HTN:** hypertension; **CS:** cesarean section; **UTI:** urinary tract infection.

Functional and sexual outcome: The median follow up was 14(11-18) months, with no recurrence. The mean CCCS decreased from 16.7±3.2 to 12.6±1.5 during the first 6 months of follow up but the improvement was not statistically significant (P = 0.348). At 12 months of follow up, it significantly decreased to 10.4±2.3 **(P=<0.001)**. Ten patients (66.7%) were sexually active, but three (20%) of them preferred not responding to PISQ-12. So we recorded the PISQ-12 score only for 7 patients (46.7%). The mean PISQ-12 decreased from 24.4±3.2 to 18.6±3.5 during the first 6 months of follow up (P = 0.433). Significant improvement was noted at 12 months of follow up where the score decreased to 14.7±3.6 **(P = 0.044) (Table 2).** Dyspareunia was assessed as a separate item. Six patients complained of dyspareunia preoperatively, while postoperatively, three of them showed improvement, and the other three showed neither improvement nor worsening. Furthermore, one patient reported a new onset dyspareunia.

Table (2) Functional and sexual outcomes after surgery:

Score	Preoperative	Postoperative (6m)	P value	Postoperative (12 m)	P value
CCCS(Mean± SD)	16.7±3.2	12.6±1.5	0.348	**10.4±2.3**	**<0.001**
PISQ(Mean± SD)	24.4±3.2	18.6±3.5	0.433	**14.7±3.6**	**0.044**

CCCS: Cleveland clinic constipation Score, **PISQ:** Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire

Discussion

LVMR, which was first introduced by D'Hoore in 2004 [8], is one of those transabdominal approaches for pelvic anatomic reparation which was initially developed for external rectal prolapse.

A new consensus from a panel of specialists concluded that high-grade IRP and/or complex rectocele with persistent obstructive defecation symptoms could be regarded as a relative indication for LVMR, even though it is still debatable [16].

Theoretically, compared to other methods, the laparoscopic method for complex rectocele provides a number of benefits. First, it avoids the transperineal and transvaginal routes, which reduces the dyspareunia that is frequently related to these approaches. Second, avoiding transanal dilatation lowers the likelihood of incontinence. Thirdly, it enables the surgeon to manage multiple pathologies concurrently given that many cases exhibit multiple organ prolapses, as shown in the current study.

It is worth mentioning that the correction of anatomy, which is confirmed by postoperative defecography, doesn't necessarily associate with meaningful symptomatic relief [17]. This may explain the vast variety of outcomes for the alleviation of obstructive defecation symptoms that have been described in the literature, as in a novel systematic review describing an overall postoperative improvement for obstructive defecation in 55-86% of patients, and the noticed improvement of CCCS was between 3.1 and 9 points across researches of LVMR for IRP and/or rectocele [18].

In the present study, although the decline in CCCS by 4 points at the median follow up of 6 months, and the significant decrease by 6 points at 12 months of follow up, seven patients (46.7%) still have residual symptoms of constipation.

On the other hand, in 2008, the Food and Drug Administration (FDA) issued a warning of critical complications, comprising mesh erosion, dyspareunia, infections, and urinary problems, following trans-vaginal mesh repairs in general, with ongoing concerns reported in 2011 [19].

Complications following LVMR need to be given extra attention. After ventral mesh rectopexy, Badrek-Al Amoudi released a list of serious side effects (rectal stricture, erosion, and pelvic pain) that were handled in a tertiary referral facility [20]. Mesh-related complications remain a matter of concern, though they were absent in our study. Eighteen (4.8%) participants in a retrospective study with a major cohort of 919 cases and a median follow-up of 33 months experienced mesh-related problems [21]. It has been recommended that biological mesh lowers the risk of mesh erosion. Mesh erosion was reported in a multicenter study of 2203 cases after LVMR, and it occurred in 2.4% of patients using synthetic meshes and 0.7% of patients using biologic meshes, with a median of 23 months [22]. In a recent published review reporting the incidence of mesh associated complications after LVMR, has revealed that mesh-related erosion after LVMR is more frequent after synthetic mesh placement, although the recorded incidence rate for synthetic and biological meshes is low (synthetic, 1.87%; biological, 0.22%, respectively) [23].

In a recently recorded critical appraisal of the increasing practice of LVMR according to low level evidence, the investigators argue that high-level evidence is required and attention in upcoming studies should target the improvement of bowel functions as well as sexual problems [24]. In the literature, there is a paucity of reports on sexual function with different outcomes. Worsening of sexual problems was reported by Horisberger et al. when more than half of the females demonstrated postoperative impairment of sexual life, while less than 50% stated an improvement, and they concluded that, after LVMR for obstructive defecation, there has been an encouraging improvement in constipation and QoL. On the other hand, the effects on sexual life vary; while some cases experience improvements, a significant number experience a negative impact [11]. On the other hand, two French researchers recorded the positive effect of LVMR on the sexual problems in patients with complex rectocele, as there was a significant improvement in dyspareunia in 85% of patients who responded to the brief index of sexual functioning for women (BISF-W) questionnaire. In addition, no de novo dyspareunia was observed [6, 13].

Another major concern is the QoL after this kind of surgery. A Chinese study emphasized the improvement of patients' QoL in all four subsets of the Patient Assessment of Constipation Quality of Life Questionnaire (PAC-QOL): Three of them demonstrated statistical significance (physical discomfort, Worries and concerns, satisfaction) after LVMR for obstructive defecation in cases with overt pelvic structural abnormalities [10]

Additionally, Abdelnaby et al. have recorded a significant improvement in CCCS, PISQ-12, and PAC-QOL in 72 patients with complex rectocele who underwent LVMR compared with 159 patients who underwent trans-vaginal posterior colporrhaphy [12].

In our collective data, the improvement in PISQ - 12 didn't reach a significant level during the first 6 months of follow up. However, it showed a significant improvement after a median follow up of 12 months. In the present study, we assessed dyspareunia as a separate item. Nearly half of our patients who had preoperative dyspareunia, improved postoperatively, while the other half didn't show any improvement or worsening. Moreover, only one patient developed new onset dyspareunia.

Finally, the effect of rectocele surgery on patients' sexual function is also poorly understood. Female sexual dysfunction may be caused by several factors, including physical (neurological, vascular, and muscular) or psychological changes. Surgical trauma is just one of many potential causes. Because of this, sexual disorders are a frequently neglected issue that may have a negative impact on the patient's QoL. Adding to the complexity of management, up to 45% of cases with sexual difficulties don't disclose them to doctors out of embarrassment, and up to 56% don't even consider them a surgical concern [25].

The strength of this study is its longitudinal pattern, which shows the short term functional outcomes over different follow up time intervals (6 months and 12 months).

The limitation of the current study is the small sample size, in addition to the short term follow up. Another limitation is the lack of an assessment of the incontinence score using the validated Wexner score. Another limitation is the long operative time, which was influenced by the surgical learning curve.

Further prospective studies with a large sample size are required to provide conclusive evidence.

Conclusion:

LVMR is a safe procedure for complex rectocele with a comparable functional outcome. Obstructive defecation symptoms and sexual function showed significant improvement after 1 year of follow-up. Nevertheless, long term follow up data is required.

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Conflict of interest

No conflict of interest.

Data availability: The research data is available from the corresponding author upon reasonable request.

Authors' contribution: Aly Sanad designed the study, shared in the data analysis, and wrote the manuscript. Ahmed Sakr and Hossam Elfeki contributed to data collection, patients' interviews, drafting, and revision of the manuscript. Samy Abbas, El Yamani Fouda, Emad Abdallah, Waleed Thabet, and Waleed Omar shared in the data analysis, interpretation, and revision of the manuscript. All authors read and approved the final version of the manuscript.

References

1. Dietz HP, Steensma AB. The role of childbirth in the etiology of rectocele. BJOG 2006; 113: 264–7.
2. Palit S, Bhan C, Lunniss PJ et al. Evacuation proctography: a reappraisal of normal variability. Colorectal Dis. 2014; 16: 538–46.
3. Farid M, Madbouly KM, Hussein A, Mahdy T, Moneim HA, Omar W. Randomized Controlled Trial between Perineal and Anal Repairs of Rectocele in Obstructed Defecation. World J Surg 2010; 34(4):822-9
4. Zimmermann EF, Hayes RS, Daniels IR, Smart NJ, Warwick AM. Transperineal rectocele repair: a systematic review. ANZ J Surg. 2017; 87:773–779.
5. Giarratano G, Toscana C, Toscana E, Shalaby M, Sileri P. Stapled transanal rectal resection for the treatment of rectocele associated with obstructed defecation syndrome: a large series of 262 consecutive patients. Tech Coloproctology. 2019; 23(3):231-237.
6. Abet E, Lehur PA, Wong M, Rigaud J, Darnis E, Meurette G. Sexual function and laparoscopic ventral rectopexy for complex rectocele. Colorectal Dis. 2012; 14(10):e721-6.
7. Formijne Jonkers HA, Poierrié N, Draaisma WA, Broeders IA, Consten EC. Laparoscopic ventral rectopexy for rectal prolapse and symptomatic rectocele: an analysis of 245 consecutive patients. Colorectal Dis. 2013; 15(6):695-9.
8. D'Hoore A, Cadoni R, Penninckx F. Laparoscopic ventral rectopexy for total rectal prolapse: long-term outcome. Br J Surg 2004; 91:1500–5
9. Wong M, Meurette G, Abet E, Podevin J, Lehur PA. Safety and efficacy of Laparoscopic ventral mesh rectopexy for complex rectocele. Colorectal Dis 2011; 13: 1019–23
10. Ye GY, Wang Z, Matzel KE, Cui Z. Short-term outcomes of laparoscopic ventral rectopexy for obstructed defecation in patients with overt pelvic structural abnormalities-a Chinese pilot study. Int J Colorectal Dis. 2017; 32(9):1337-1340.
11. Horisberger K, Rickert A, Templin S, Post S, Kienle P. Laparoscopic ventral mesh rectopexy in complex pelvic floor disorder. Int J Colorectal Dis. 2016; 31(5):991-996.
12. Abdelnaby M, Fathy M, Abdallah E, Balata M, Arnous M, Mikhail HM, Emile SH. Laparoscopic Ventral Mesh Rectopexy Versus Transvaginal Posterior Colporrhaphy in Management of Anterior Rectocele. J Gastrointest Surg. 2021; 25(8):2035-2046.
13. Wong MT, Meurette G, Rigaud J, Regenet N, Lehur PA. Robotic versus laparoscopic rectopexy for complex rectocele: a prospective comparison of short-term outcomes. Dis Colon Rectum. 2011; 54(3):342-6.
14. Agachan F, Chen T, Pfeifer J, Reissman P, Wexner SD. A Constipation Scoring System to Simplify Evaluation and Management of Constipated Patients. Diseases of the Colon and Rectum. 1996; 39(6):681-685.
15. Rogers RG, Coates KW, Kammerer-Doak D, Khalsa S, Qualls C. A Short Questionnaire (PiSQ-12). International Urogynecology Journal and Pelvic Floor Dysfunction. 2003; 14(3): 164-16
16. Mercer-Jones MA, D'Hoore A, Dixon AR, Lehur P, Lindsey I, Mellgren A, Stevenson AR. Consensus on ventral rectopexy: report of a panel of experts. Colorectal Dis. 2014; 16(2):82-8.
17. Akira Tsunoda 1, Tomoyuki Ohta, Yoshiyuki Kiyasu, Hiroshi Kusanagi Laparoscopic ventral rectopexy for rectoanal intussusception: postoperative evaluation with proctography Dis Colon Rectum. 2015; 58(4):449-56.
18. Jan J van Iersel, Tim J C Paulides, Paul M Verheijen, John W Lumley, Ivo A M J Broeders, and Esther C J Consten. Current status of laparoscopic and robotic ventral mesh rectopexy for external and internal rectal prolapse. World J Gastroenterol. 2016; 22(21): 4977–4987.
19. Stanford E, Moen M. Patient safety communication from the Food and Drug Administration regarding transvaginal mesh for pelvic organ prolapse surgery. J. Minim. Invasive Gynaecol. 2011; 18: 689–91
20. Badrek-Al Amoudi AH, Greenslade GL, Dixon AR. How to deal with complications after laparoscopic ventral mesh rectopexy: lessons learnt from a tertiary referral center. Colorectal Dis 2015: 707–712.
21. Consten EC, van Iersel JJ, Verheijen PM, Broeders IA, Wolthuis AM, D'Hoore A. Long-term outcome after laparoscopic ventral mesh rectopexy: an observational study of 919 consecutive patients. Ann Surg 2015; 262(5):742–747.

22. Evans C, Stevenson AR, Sileri P, Mercer-Jones MA, Dixon AR, Cunningham C, Jones OM, Lindsey I. A Multicenter Collaboration to Assess the Safety of Laparoscopic Ventral Rectopexy. Dis Colon Rectum. 2015; 58(8):799-807.
23. Andrea Balla, Silvia Quaresima1, Sebastian Smolarek2, Mostafa Shalaby1, Giulia Missori1, Pierpaolo Sileri. Synthetic versus Biological Mesh-Related Erosion After Laparoscopic Ventral Mesh Rectopexy: A Systematic Review Ann Coloproctol 2017; 33(2):46-51.
24. Lundby L, Laurberg S. Laparoscopic ventral mesh rectopexy for ODS—time for a critical appraisal. Colorectal Dis. 2015; 17(2):102-103.
25. Buvat J, Glasser D, Neves RC, Duarte FG, Gingell C, Moreira ED Jr. Sexual problems and associated help-seeking behavior patterns: results of a population-based survey in France. Int J Urol 2009; 16: 632–8