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Original Research Article

Comparison between laparoscopic and open abdominal rectopexy for full-thickness rectal prolapse: controlled clinical trial

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ABSTRACT

Background: Abdominal rectopexy is an appropriate treatment option for full-thickness rectal prolapse (FTRP). Our aim is to evaluate the effectiveness and surgical outcome of laparoscopic posterior mesh rectopexy in treatment of FTRP by comparing this procedure with the traditional open approach.
Methods: Thirty consecutive cases with FTRP were included and subjected to abdominal posterior mesh rectopexy from September 2013 to February 2016 at Sohag University Hospital. Thirteen patients were managed laparoscopically and 17 patients underwent open posterior mesh repair. Demographic data and surgical outcome were compared in both groups.
Results: Laparoscopic group showed an earlier tolerance to oral feeding (1.26±0.42 versus 2.16±1.36 days, p=0.03), and earlier hospital discharge and return to work (5.63±2.91 versus 8.24±4.64 days, p=0.016, 18.28±2.61 versus 28.64±3.82 days, p=0.032, respectively). The mean consumed postoperative analgesics per day was less among laparoscopic group (1.63±16.2 versus 2.68±34.21 ampoule/day, p=0.012). Incidence of wound infection, wound dehiscence, prolonged ileus and postoperative chest infection were more in open group. There were significant postoperative improvement of continence status, rectal bleeding and abdominal pain in each group. Incidence of postoperative constipation was slightly increased in both groups, but without significant difference. Recurrence occurred in one case only in open group. There were no mortalities in both groups.
Conclusions: Laparoscopic posterior mesh rectopexy for FTRP can be done safely even in elderly patients. It offers less postoperative pain, low incidence of postoperative morbidities, early hospital discharge and return to work, in addition to cosmetically better outcome. Laparoscopic rectopexy has the same functional outcome as open technique.

Keywords: Laparoscopy, Rectopexy, Transabdominal

INTRODUCTION

Full-thickness rectal prolapse (FTRP) describes a condition in which the entire layer of the rectal wall protrudes through the anal canal.[1] There are many procedures described for the treatment of rectal prolapse, which can be divided into abdominal or perineal approach.[2] Perineal procedures are considered less invasive and are thus used more frequently in high-risk patients. However, they are associated with higher rates of recurrence.[3,4] Abdominal approaches are associated with lower recurrence rates and improved functional and physiological outcomes.[5-7] However, the need of a laparotomy wound represents a potential source of significant mortality and morbidity, which minimizes the role of transabdominal approaches in elderly and debilitated patients.[8] An abdominal approach usually involves a rectopexy, with or without resection of the

sigmoid colon. Currently, laparoscopic surgery has emerged as a tool for the treatment of FTRP and in particular is well suited for by fixation rectopexy with or without resection.[9] Several larger comparative studies between open and laparoscopic rectopexy, have been published confirming the technical feasibility and demonstrating some of the established advantages of the laparoscopic approach.[2,9-12]

In our locality, this is the first clinical trial to employ the use of laparoscopy in treatment of FTRP by posterior mesh rectopexy. The aim in this study is to evaluate the effectiveness and surgical outcome of laparoscopic posterior mesh rectopexy in treatment of FTRP by comparing this procedure with the traditional open approach.

METHODS

This controlled non-randomized clinical study was carried out at Sohag University Hospital from September 2013 to Feb 2016. Only 30 patients with FTRP confirmed to the selection criteria and informed about pros and cons of each technique. All eligible cases were consented. All patients with FTRP were submitted to whether laparoscopic or open posterior mesh rectopexy.

All cases were subjected to preoperative diagnostic evaluation, including full history taking with special information about history of bowel function, rectal digital examination, routine investigations and rectosigmoidoscopy.

Comparative study was done between laparoscopic and open groups by assessing operative time, mean consumed postoperative analgesics per day during the first 3 days after surgery, early postoperative complications; time to tolerate normal diet and time to return to work, mortality rate, state of postoperative bowel function and recurrence rate.

Exclusion criteria in both groups included; patients with concomitant gynecological procedures, recurrent rectal prolapse after previous rectopexy, large irreducible prolapse as it would be better repaired by perineal rectosigmoidectomy, patients with obstructive defecation and concomitant rectocele or and mucosal prolapse as they were better operated by a Delorme's procedure and patients with previous lower abdominal surgery.

Preoperative preparation was done to all patients by mechanical bowel cleansing the day before surgery, prophylactic parental broad-spectrum antibiotic (Cefepime, 2 grams IV) at the time of induction of anaesthesia, low molecular weight heparin (0.4 ml/day) two hours before surgery and introduction of self-retaining urinary catheter.

The laparoscopic procedure started by irrigation of the rectum with 10% povidone iodine in 500 ml of 0.9% warm saline. The patient was set in lithotomy position with extreme tilting of the body towards the head to facilitate the use of gravity as a retractor for the small intestine. Pneumoperitoneum was induced by Veress needle and maintained with CO_2 pressure at 14 mmHg. Camera 10-mm port was placed below the umbilicus. Three additional working 10-mm ports were inserted, 2 of them were placed on the right side of the abdomen, lateral to the rectus muscle with a hand's width apart and around the umbilicus. The third working port was introduced in the left lower quadrant of the abdomen and lateral to the rectus muscle. The peritoneal reflexion of the rectum was grasped and opened until reaching the level of the sacral promontory (Figure 1 and 2).

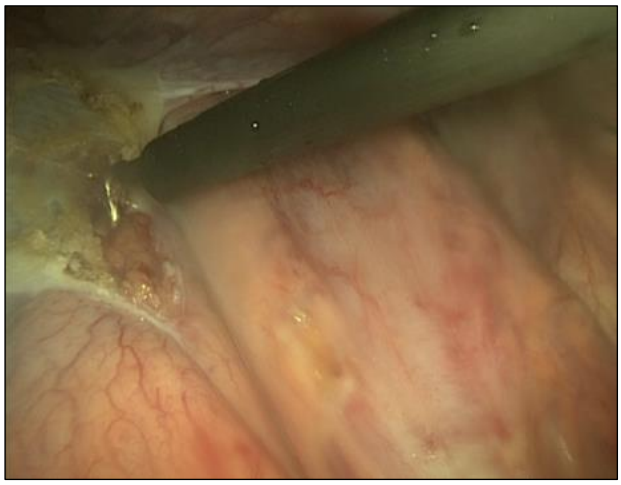

Figure 1: Grasping and opening of peritoneal reflexion of the rectum.

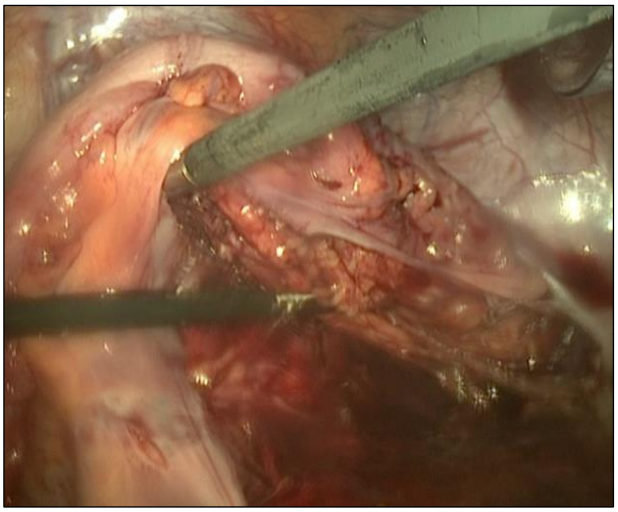

Figure 2: Dissection of the rectum from the peritoneal reflexion.

The avascular plane around the rectum was reached and dissected carefully down to the ano-rectal junction without dividing the lateral ligaments (Figure 3 and 4). The dissection was facilitated by the help of the ultrasonic device (Harmonic Scalpel).

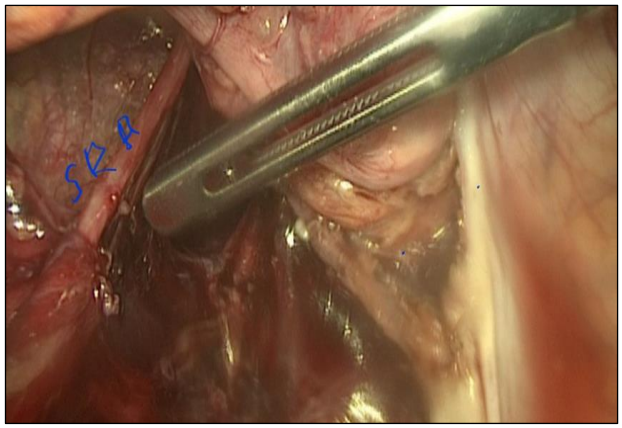

Figure 3: Dissection within the avascular plane around the rectum (SRA: Superior rectal artery).

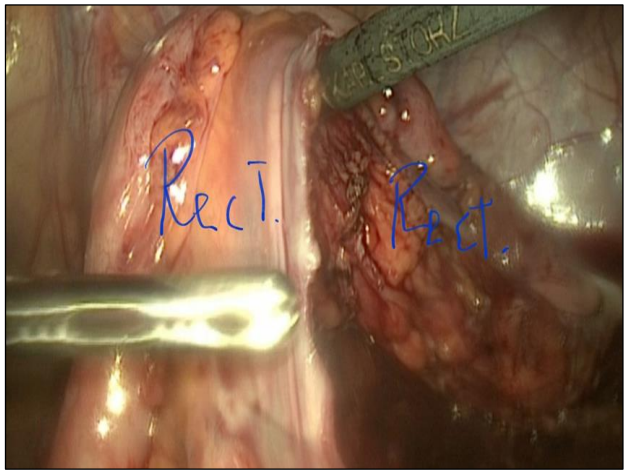

Figure 4: Full mobilization of the rectum.

Polypropylene mesh (Ethicon, UK) 6x11cm was introduced into the abdomen and was initially fixed posteriorly to the sacral promontory by endoscopic stapler (Figure 5). After fixation of the mesh, the 2 limbs of the mesh were fixed to the mobilized rectal wall by 2-4 sutures (2/0 polypropylene sutures, Ethicon, UK) on either side (Figure 6). A tubal drain was placed posteriorly to drain fluid and blood.

The open procedure was performed by the same team of surgeons and with same steps as laparoscopic technique but via open supra pubic midline incision.

Postoperative management included, intravenous fluids until tolerance to oral feeding, parenteral broad-spectrum antibiotics (Cefepime, 1gm/12 hours and metronidazole, 500mg/12 hours) and nasogastric aspiration. All patients received an intramuscular ampoule of Nalbuphine (20mg) after they regain consciousness as a standard use of postoperative analgesia; additional analgesic ampoules of Nalbuphine or non-steroidal analgesic ampoules were given to the patients according to their need for postoperative pain relief. Follow up was done to all patients every 3 months during the first year and each 6 months later on in a regular outpatient visits. The follow up included clinical evaluation with complete analyses to the functional outcome and recurrence. In the present study student's t- test was used to verify the comparative study between both groups and $P<0.05$ was considered to be statistically significant.

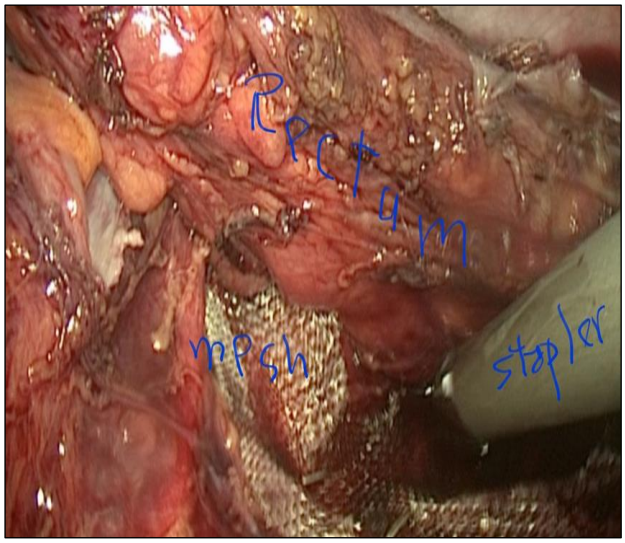

Figure 5: Posterior fixation of the mesh by endoscopic stapler.

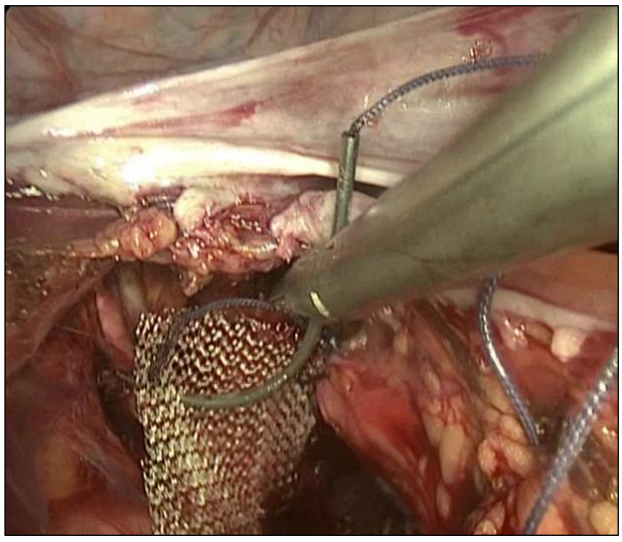

Figure 6: Fixation of the mesh to the mobilized rectum.

RESULTS

Laparoscopic posterior mesh rectopexy was performed to 13 patients (Laparoscopic group); during the same period, open posterior mesh repair was done to17 patients with FTRP (open group). Demographic data and preoperative clinical findings were recorded in both groups as shown in Table 1.

Table 1: Demographic data of both laparoscopic and open group.

Demographic findings	Laparoscopic group	Open group
Number of patients	13	17
Age in years (Mean±SD)	(2672) (48±12.4)	(2475) (52±16.8)
Sex (M/F)	5/8	7/10
Duration of prolapse in years (Mean±SD)	5.5 (±1.7)	6.4 (±2.2)
Length of the prolapse (cm) (mean, range)	10 (6-14)	11 (8-14)

The operative findings and postoperative observations were detected and compared in both groups as shown in Table 2. The operative time was more in Laparoscopic technique, but without statistical difference in comparison with the open procedure. There was significant statistical difference between laparoscopic and open groups as regards; start to oral feeding, mean consumed analgesic ampules during the first three postoperative days, hospital stay and return to work. All patients in laparoscopic group completed the procedure successfully without conversion to open surgery

The surgical outcome was recorded and compared in both groups in Table 3. The incidence of intraoperative sacral venous bleeding, wound infection, wound dehiscence, atelectasis, chest infection and prolonged ileus were more in the open group.

Assessment of constipation was detected in the present series according to Drossman et al, who verified constipated patients if they had two or fewer bowel actions per week or required the need of stimulant laxatives or enemas to act two or more bowel movements a week.[13]

Table 2: Operative findings and postoperative care.

Operative and postoperative findings	Laparoscopic group	Open group	Value
Number of patients	13	17	
Operative time	116.24±32.42	108.12±46.24	0.45
Conversion to open surgery	-	-	
Start to oral feeding (mean days)	1.26±0.42	2.16±1.36	0.03*
Mean consumed analgesic ampoules during first 3 days (Ampoules/day)	1.63±16.2	2.68±34.21	0.012*
Hospital stays (mean days)	5.63±2.91	8.24±4.64	0.016*
Return to work (mean days)	18.28±2.61	28.64±3.82	0.032*

Table 3: Postoperative complications and mortality.

Surgical outcome	Laparoscopic group	Open group
Intraoperative sacral venous bleeding	0 (0%)	1 (5.9%)
Wound infection	1(7.7%)	3 (17.6%)
Wound dehiscenc	0 (0%)	2 (11.8%)
Atelectasis	0 (0%)	1 (5.9%)
Chest infection	1 (7.7%)	2 (11.8%)
Prolonged ileus	0 (0%)	2 (11.8%)
Recurrence rate	0 (0%)	1 (5.9%)
Mortality	0 (0%)	0 (0%)

In the present study, the number of constipated patients was slightly increased in both groups, but without significant statistical difference in comparison with the preoperative constipation, (preoperative constipation was 69% and 65% in both groups and after surgery, it increased to 77% and 76% respectively) Table 4.

Assessment of faecal incontinence in our patients was done by using Browning and Parks continence scale: incontinence for solid stool (grade 4), incontinence for liquid and flatus (grade 3), incontinence for flatus only (grade2), and normal (grade 1).[14] In this literature, there were significant postoperative improvement of continence status, rectal bleeding and abdominal pain in each group, but this improvement showed no statistical significant difference between both groups, Table 4. During the follow up period that was ranged from 11 to 25 months with a mean 14.2 months, recurrence occurred in one case only among open group (Table 3). Recurrence was due to sever constipation that appeared 6 months after operation and managed by transperineal Delorme's procedure. No detectable mortalities during the follow up period.

Table 4: Assessment of functional outcomes of both groups.

No.	Laparoscopic group (A)			Open group (B)			P. value A and B
	Preoperative	Postoperative	P. value	Preoperative	Postoperativ	P. value	
No. of constipated patients	9/13 (69%)	10/13 (77%)	N.S	11/17 (65%)	13/17 (76%)	N.S	**N.S**
Continence score (Mean±SD)	2.2±1.62	1.38±0.42	0.038*	2.32±3.82	1.41±1.46	0.036	**N.S**
Rectal bleeding	9	1	0.001*	11	2	0.001*	**N.S**
Abdomen pain	10	5	0.002*	12	8	0.004*	**N.S**

NS: non-significant

DISCUSSION

Variety of approaches to the repair of FTRP have been advocated over the past several decades.[15] Transabdominal rectopexy is one of the accepted treatment options for FTRP.[8] However the need of laparotomy wound represents a potential source of significant mortality and morbidity, which minimizes the role of transabdominal approaches in older and debilitated patients.[8,16] Consequently, transabdominal rectopexy have been performed laparoscopically with good surgical outcome even in debilitated patients.[9]

In this work, the demographic data of both laparoscopic and open groups showed that most of our patients were female with the mean age 48 and 52 years respectively, this was consistent with other similar studies.[8,15-18] During the laparoscopic procedure, we used four port sites to perform the laparoscopic posterior mesh repair for FTRP, this is in agreement with other many studies.[8-10]

Also, in this study, the operative time in laparoscopic group is more than open group, but without significant statistical difference (P value 0.45). This is parallel with other many studies.[10,15,19,20]

However, Laparoscopic group of our patients showed significant statistical difference in comparison with the open group as regards; start to oral feeding, the mean consumption of postoperative analgesic ampules, hospital stay and return to work. These results agree with many related comparative studies.[1,2,9-12,15,21]

Furthermore, our postoperative surgical outcome showed that the reported incidence of wound infection, wound dehiscence, atelectasis, chest infection and prolonged ileus, were less among the laparoscopic group series in comparison with open group. Many other current studies have similar reported results.[8,11,12,21]

Denervation by full rectal mobilization causing dysmotility of the rectum, the redundant sigmoid colon filling the space of Douglas and prosthetic mesh fixing the rectum on the presacral fascia are some of the reasons why patients with FTRP experience postoperative constipation.[12,22,23] In addition to division of the lateral ligaments, resulting in impaired motility of the rectum which acting as a functional obstructing segment.[24] This theory was supported by Speakman and others who stated that full mobilization of the rectum with division of its lateral ligaments made the rectum a functionally obstructing segment.[25]

In this literature Dissection and mobilization of the rectum was done without dividing the lateral ligaments. This is consistent with other many current studies which stated that preservation of the lateral ligaments is more beneficial for defecation function. On the other hand, some authors prefer to divide the lateral ligaments before mesh fixation to prevent prolapse recurrence.[9,26] Benoist et al, preferred to divide the lateral ligaments before mesh rectopexy in addition with resection of the redundant sigmoid colon to reduce the risk of postoperative constipation.[8]

Inspite of preservation of the lateral ligaments during mobilization of the rectum, the incidence of postoperative constipation in our series was not improved and the number of constipated patients was slightly increased in both (laparoscopic and open) groups but without significant statistical differences in comparison with the preoperative constipation. These results are consistent with other similar studies.[9,11,12,26]

During the follow up period, results showed that recurrence occurred in one patient only among the open group (6%), while no detectable recurrence in laparoscopic group. These recorded results were close to the incidence of other similar studies that was ranged from 0-13% after abdominal posterior mesh rectopexy.[1,17,26]

Patients with FTRP have markedly impaired rectal adaptation to distention, which may contribute to anal incontinence, and consequently more than half of the patients with rectal prolapse have coexisting incontinence.[22] Improvement of fecal incontinence is 3-40% after abdominal posterior mesh rectopexy.[1,26]

In the present study, there were significant postoperative improvement of incontinence status in both laparoscopic and open groups (P = 0.038 and 0.036 respectively) but this improvement had no significant differences in comparison between the two groups. It seems to be similar to other reported studies.[8,9,12,22,24,26,27]

No mortalities were detected in the laparoscopic and open groups. This is within the range of the recorded incidence of postoperative mortality which is 0-6.5%.[1]

CONCLUSION

The study concluded that Laparoscopic posterior mesh rectopexy for FTRP can be done safely even in elderly patients. It offers less postoperative pain, low incidence of postoperative morbidities, early hospital discharge and return to work, in addition to cosmetically better outcome. Moreover, laparoscopic rectopexy has the same functional outcome as open technique

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