Laparoscopic Suture Rectopexy : An Effective Treatment for Complete Rectal Prolapse

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Abstract

Background: The study was undertaken to validate the efficacy of laparoscopic suture rectopexy as the treatment modality of choice for complete prolapse of rectum.

Methods: Data was prospectively collected and analyzed on 36 patients who underwent laparoscopic suture rectopexy for full thickness rectal prolapse between May 2006 to May 2008. There were 10 male and 26 female patients in this study with a mean age of 43.5 years. The pre and postoperative course of each patient was followed up with attention paid to ano-rectal manometry pressures, first bowel movement, hospital stay, duration of surgery, faecal incontinence, constipation, recurrence and morbidity. Mean follow up period was 12 months (range 1-24 months).

Result: One patient had conversion from laparoscopic to open surgery. while another had recurrence of prolapse in the follow up period. Mean duration of surgery was 115 (range 100-150) minutes. Postoperatively, the mean time for the first bowel movement was 40 (range 24-64) hours. Mean hospital stay was five (range 4-7) days. There was no significant postoperative complication except for one port site infection and one pelvic collection. Of the 20 patients who had varying degree of incontinence preoperatively, 16 (80%) showed improvement after surgery. Constipation was present in 15 (41%) patients preoperatively. Nine of these 15 patients (60%) improved as regards constipation after surgery.

Conclusion: Laparoscopic suture rectopexy is both safe and effective operation for the management of complete prolapse rectum. The procedure carries minimal morbidity and helps improve the problems of incontinence and constipation.

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Key Words : Laparoscopic; Suture rectopexy; Rectal prolapse

Introduction

Complete prolapse of rectum is a distressing clinical entity, symptoms including mucus discharge, rectal bleeding, tenesmus, constipation and incontinence in addition to the prolapse itself. Many surgical procedures have been described for complete rectal prolapse, which may either be via a perineal or transabdominal approach [1]. With the evolution of laparoscopic colo-rectal surgery, the benefits of laparoscopic rectopexy over open rectopexy are obvious, particularly when the results of both the procedures are comparable [2,3,4]. Both laparoscopic resection rectopexy and laparoscopic suture rectopexy without resection have been described, each with its own merits [5,6]. However, a colonic resection requires a colonic anastomosis and an abdominal incision to retrieve the specimen, making it technically demanding and time consuming [5]. Laparoscopic posterior mesh rectopexy without resection has the problems of increased constipation after surgery in addition to increased cost of the mesh [7]. On the other hand, suture rectopexy without resection may be regarded as an ideal laparoscopic

procedure in that it can be performed entirely intracorporeally and by avoiding the use of a mesh improve functional results such as constipation. The objective of this study is to see whether laparoscopic suture rectopexy can be used safely and effectively in patients with complete prolapse rectum, with comparable results of other laparoscopic procedures.

Material and Methods

A total of 36 patients with full-thickness rectal prolapse who underwent laparoscopic suture rectopexy between Apr 2006 to May 2008 at Armed Forces Medical College (AFMC) and Command Hospital Southern Command (CH (SC)), Pune, had data prospectively collected and analysed and formed the database of this study. The exclusion criteria were patients requiring concomitant gynaecological procedure, patients who had earlier undergone some surgery for prolapse rectum or patients with large irreducible prolapse. Constipation in conjunction with prolapse rectum was not an exclusion criteria nor was previous lower abdominal surgery. Before surgery all patients had undergone either a barium enema or colonoscopy at some stage of their investigation to exclude a proximal colonic lesion. Preoperative assessment of incontinence and constipation was done in all patients. For

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this study fecal incontinence was graded on a scale described by Browning et al [8]. Grade I is normal continence, Grade II is continence to liquids and solids but incontinent to flatus, Grade III is incontinence to liquids and flatus but continent to solids, Grade IV is incontinent to flatus, liquids and solids. Grade I and II are regarded as continent and Grade III and IV as incontinent. Constipation has been notoriously difficult to define but for the purpose of this study it has been defined as two or fewer bowel movements per week or straining for >25% of their defecation time [9]. Ano-rectal manometry was performed in all patients. Resting anal pressure (RAP) and maximal squeeze pressure (MSP) were assessed preoperatively and then three months and six months after surgery. Preoperative and postoperative course of the patients was recorded with attention paid to first bowel movement after surgery, fecal incontinence, constipation, recurrent prolapse, morbidity and mortality. Postoperative morbidity was defined as complication occurring within 30 days after surgery.

Each patient underwent preoperative bowel preparation one day prior to surgery and was given antibiotics (cefotaxime 1g and metronidazole 500 mg) intravenously (IV) at induction of anaesthesia. All patients received full deep venous thrombosis (DVT) prophylaxis with low molecular-weight dextran and lower limb stockings in intraoperative and perioperative period. Patient was kept supine with a 15° Trendelenberg tilt. After urinary catheterization, pneumoperitoneum was created by using a Veress needle through supraumbilical stab incision. We used a four port technique using two 10 mm and two 5 mm port. The second 10 mm port which functioned as the right hand of the surgeon was purposely placed a little lower in the right iliac fossa so as to prevent the see-saw effect over the sacral promontory when dissecting deep down in the pelvis. After introducing the first 10 mm supraumbilical trocar, a zero degree telescope was used to guide the entry of the remaining three trochars. The assistant standing to the left of the patient used a 5 mm Endobabcock to lift the rectosigmoid junction and retract to the left. The sacral promontory was identified and so was the ureter on the right side. The dissection was started on the right side by incising the peritoneum to the right of the rectum from the promontory to the recto-vesical / vaginal pouch. Complete dissection was done using diathermy scissors only. The rectum was mobilized by developing the posterior plane through the loose areolar tissue between the mesorectum and the presacral plexes of veins. The ureters and the presacral nerves were identified and preserved during the course of the dissection. The anterior peritoneal fold in the recto-vesical pouch and the lateral fold to the left of the rectum were then cut, lifting the rectum completely of the sacral hollow. The lateral ligaments were not cut during the procedure. The rectum was then hitched by suturing the mesorectum to the sacral promontory with 2-0 silk, using one suture on either side. At this stage the right side 5 mm port was used for retraction and the suturing was done by the left 5 mm port and the right 10 mm port. This little change made the laparoscopic suturing very convenient by taking the two functioning hands on either side of the camera. After giving a saline wash the

abdomen was deflated, the 10 mm ports were closed with 2-0 vicryl suture and the skin wounds closed with skin stapler. No drain was left in the presacral space.

In the postoperative period patient was kept on intravenous fluids for one day but sips of water was started on the evening of surgery, oral fluids started on first postoperative day and solids on second postoperative day. All patients were given liquid paraffin 15 ml daily from second postoperative day for the next two weeks. All patients were given only three doses of antibiotics. All patients were admitted one day prior to surgery and length of hospital stay was calculated from the admission to the day when he was considered medically fit to be discharged. Passage of flatus and first stools after surgery were documented in hours after surgery.

Results

A total of 36 patients of complete prolapse rectum underwent laparoscopic suture rectopexy from Apr 2006 to May 2008 at Pune. There were 10 males and 26 females, age ranging from 25 years to 73 years (mean age 43.5 years). Varying degree of incontinence was seen in 20 (55%) of the 36 patients of complete prolapse rectum, operated in this series. Of the patients who had incontinence preoperatively, 10 had Grade II incontinence while 10 had Grade III / IV incontinence (Table 1). Postoperative evaluation of incontinence showed that 16 (80%) of the 20 incontinent patients showed improvement after surgery.

Constipation was noted in 15 (41%) of the 36 patients in preoperative evaluation. Of these 15 patients, 9 (60%) improved as regards constipation after surgery. The results of pre and postoperative anorectal manometry studies showed that both RAP and MSP improved in patients whose incontinence improved after surgery (Table 2).

All 36 patients were taken up for laparoscopic suture rectopexy. Of these 36 patients eight patients had earlier undergone some lower abdominal open surgery. The procedure was successfully completed in 35 patients. In one

Table 1
Pre and post operative status of incontinence

Grade of incontinence	Preoperative status (No of patients)	Postoperative status (No of patients)
I	16	32
II	10	2
III	7	2
IV	3	-

Table 2
Pre and postoperative manometry studies

	Preoperatively		Postoperative	
	Continent patients (n=16)	Incontinent patients (n=20)	Continent patients (n=28)	Incontinent patients (n=4)
Mean RAP (mm of Hg)	36	24	38	20
Mean MSP (mm of Hg)	80	50	83	45

patient, who had earlier undergone abdominal hysterectomy there were severe postoperative adhesions, making the exact anatomy in the pelvic region indiscernible. This case was converted to open procedure and the suture rectopexy was completed. There was no case in which there was injury to the bowel or rectum during surgery. All surgeries except the one that was converted to open surgery were successfully completed by the four port technique. The average total duration of surgery was 115 min (range 100-150 min). The patient who was converted to open surgery is not included in this.

In the postoperative period, the first passage of flatus was documented after 26 hours (range 18-30 hours) and passage of first stools after 40 hours (range 24-64 hours). The average length of hospital stay, excluding the patient who underwent open rectopexy, was five days (range 4-7 days). There was no significant postoperative complication except for one port site infection and one postoperative pelvic collection. The wound infection was handled by repeated dressings and the pelvic collection was managed by antibiotics and one needle aspiration trans-rectally. Culture of the aspirate was sterile.

All patients were followed up for recurrence. The average period of follow up was 12 months (range 1-24 months). There was only one case of recurrence of prolapse which occurred within three months of surgery. This patient had marked constipation preoperatively which persisted even after surgery. He was subsequently taken up for open surgery when resection of redundant recto-sigmoid and rectopexy was done. Thereafter both constipation and prolapse were treated.

Discussion

The problem of complete rectal prolapse is formidable, with no clear predominant treatment of choice. Surgical management is aimed at restoring physiology by correcting the prolapse and improving continence and constipation with acceptable mortality and recurrence rate. Laparoscopic procedures for complete prolapse rectum have become the operations of choice because of the benefits of minimal invasive surgery along with comparative rates of recurrence [10]. The advantages of laparoscopic rectopexy over open rectopexy are all short term but there is no evidence of any adverse effect on long-term outcomes, hence making it the approach of choice [4]. The indications for minimally invasive surgery do not differ from those of conventional surgery. The fact that prolapse repair procedures were an early indication in the field of minimally invasive surgery reflects the relative simplicity of translating the open surgical techniques to the laparoscopic modality [11]. A variety of open abdominal surgical procedures have been practiced for the treatment of complete prolapse of the rectum [12, 13]. Majority of them include mobilization of the rectum followed by fixation of the rectum to the sacrum either by sutures or by a mesh. A resection and

anastomosis of the recto-sigmoid is added to any of the above procedures to improve the results [13]. With the improvement in laparoscopic skills and equipment the same procedures can be done laparoscopically with equally good results with added advantages of minimally invasive surgery like shorter hospital stay, lesser postoperative pain and improved cosmetic outcomes [14]. Laparoscopic rectopexy involving any sort of mesh fixation increases the cost of surgery, duration of operation and the technical skills required to accomplish the operation when compared to laparoscopic suture rectopexy. The addition of recto-sigmoid resection and anastomosis to rectopexy, laparoscopically, further adds to the demand of both equipment and skills, when practiced for all cases of complete prolapse of rectum. There is a need to identify patients of complete prolapse of rectum who are likely to benefit from this procedure, rather than recommending it for all cases.

The higher percentage of male patients in this study and a lower mean age probably represents the type of population covered by us i.e. younger army personnel. In this study only one patient (3%) required conversion from laparoscopic to open surgery because of extensive intra abdominal adhesions. This compares well with 16% conversion rate for the same procedure in a study published by Heah et al [15]. In a large series of 150 patients undergoing laparoscopic rectopexy the conversion rate was 5.3% and the reasons for conversion being injury to bowel in two patients, poor visibility and adhesions in four patients, cardiac decompensation in one and failure of light source in one [16]. Our only conversion was due to adhesions.

Constipation and anal incontinence are two associated problems with complete prolapse of the rectum. Patients with complete rectal prolapse 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 [17]. In this study 20 of the 36 patients had varying degree of incontinence when assessed pre-operatively. Half these incontinent patients had Grade III/IV level of incontinence which can be quite disturbing to the patient. In this study, patients with anal incontinence were objectively assessed by manometry studies and both RAP and MSP were significantly lower than patients with anal continence. After suture rectopexy in this series, continence levels improved in 16 (80%) of the 20 patients. Of the four remaining incontinent patients only two had Grade III incontinence and none had Grade IV incontinence [18]. A series of 42 patients of complete rectal prolapse undergoing suture rectopexy found that 90% patients had improvement in the continence levels post operatively. An 80% improvement in continence

after open suture rectopexy has also been reported by Graf et al [18]. Posterior prosthetic and later mesh rectopexy has been associated with significantly lower rate of improvement in the continence levels after surgery, with most of the studies showing an improvement levels of around 40% [19]. In the same review, laparoscopic posterior mesh rectopexy, using both nonabsorbable and absorbable meshes showed a better result in terms of improvement in continence after surgery, though it was still less than after laparoscopic suture rectopexy. The slight edge, though not significant, in improvement in continence after laparoscopic suture rectopexy when compared to laparoscopic mesh rectopexy can be explained by the fact that a mesh does interfere in rectal distensibility as compared to sutures only [20]. Post operative anal manometry studies done in our series corroborated with the clinical improvement in continence, in that both RAP and MSP showed significant improvement.

Duration of surgery is taken as one of the many yard sticks to gauge the advantages of an operation. In our series the average duration of suture rectopexy was 115 minutes (range 100-150 minutes). This compares well with the average duration of surgery for laparoscopic suture rectopexy by Heah et al [15] as 96 minutes (range 50-150 minutes). These timings compare well to resection rectopexy, average duration of 258 minutes (range 150 – 380 minutes) [21]. As regards laparoscopic mesh rectopexy average operating time of 140 minutes (range 105- 240 minutes) has been reported by Siproudhis et al [17]. The longer operating time in mesh rectopexy is understandable because of the extra time taken in introducing the mesh and then adjusting its position. Length of post operative hospital stay is an indicator of the patient's recovery and post operative complications. In our study it was 5 days (range 4-7 days). A similar duration of stay after laparoscopic suture rectopexy has been reported by Graf et al [22]. As compared to this the average postoperative stay after laparoscopic ventral mesh rectopexy was 5.8 days, with a range of 2-10 days [17] and after laparoscopic resection rectopexy was 15 days, (range 6-47 days) [21]. Laparoscopic suture rectopexy is a relatively safe procedure with minimal morbidity and no mortality [15]. There was no significant intraoperative or postoperative complication in our study except for one case of port site infection and one case of pelvic collection which were successfully handled. Significant pelvic sepsis is a major contributor to the postoperative morbidity, having been reported in 2-16% of patients with prosthetic rectopexy [19]. Laparoscopic resection rectopexy carries a morbidity in the range of 7-10% [21]. The common complications of the procedure being haemorrhage and

anastomotic leak, in addition to port site infection and pelvic collection.

Constipation is associated with prolapse in 15-65% of patients [23]. In our study constipation was observed in 15 (41%) of 36 patients. In the postoperative period, 9 (60%) of these 16 patients improved as regards their constipation. Constipation is a common problem after rectopexy, particularly so after posterior mesh rectopexy [24]. Studies have demonstrated that constipation increased from 10-47% and suggested a link with denervating the left colon and rectum with possible kinking at the recto-sigmoid junction by a redundant, unresected sigmoid colon prolapsing into the pouch of Douglas [24]. This may be specially so because the lateral ligaments containing the parasympathetic inflow to the left colon may be cut during mobilization. At least two studies have demonstrated a higher incidence of constipation with significant changes in rectal sensation when lateral ligaments are divided as compared with when they are not [25,26]. Improvement in the degree of constipation in our study can be attributed to the surgical technique used when the lateral ligaments were not divided for rectal mobilization. The use of prosthetic mesh in posterior mesh rectopexy to induce fibrosis and promote fixation is associated with sepsis and a higher incidence of constipation [24,27]. Suture rectopexy has been shown to be equally effective as mesh rectopexy in preventing recurrence but avoids the problems of post operative sepsis and increased constipation [28]. Resection rectopexy has been shown to have a superior functional outcome as regards constipation compared with both suture and posterior mesh rectopexy although having a small but definite risk associated with colonic anastomosis [24,29].

One of the important parameters to gauge the success of rectal prolapse surgery is the incidence of recurrence. Recurrence after suture rectopexy has been reported as ranging from 0-3% [18]. Recurrence rates with posterior mesh rectopexy range from 0-6% and with anterior sling rectopexy from 0-3% [19]. Even with resection rectopexy the recurrence rate range from 0-5% [30]. The laparoscopic techniques have not made any significant difference on the recurrence rates which continue to range from 0-10% in a follow up of eight to 30 months [19]. In 2001, Benoist et al [31] published their results of laparoscopic rectopexy in 48 patients. They evaluated laparoscopic rectopexy using mesh, suture and resection and concluded that there was no difference among the three groups in terms of continence and recurrence and that mesh rectopexy conferred no advantage over suture rectopexy. Our experience is no different in that we had one recurrence in 36 patients (3%). Thus it becomes obvious that regardless

of the procedure, the recurrence rates do not show any significant difference.

We would like to conclude that laparoscopic suture rectopexy is a safe procedure and has comparable results as regards morbidity, bowel function and recurrence when compared to the data available on laparoscopic mesh and resection rectopexy.

Conflicts of Interest

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