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Result Evaluation between Laparoscopic Anterior and Posterior Mesh Rectopexy in Complete Rectal Prolapse

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ABSTRACT

Background: The prospectively and retrospective collected databases for identifying outcome in patients of 20 or more years of age with full thickness external rectal prolapse (ERP) treated by laparoscopic ventral rectopexy. Primary end-points were age, and mortality, morbidity, length of hospital stay and recurrence.

Aim of the study: Evaluation of the comparative result between anterior and posterior mesh rectopexy and better method of rectopexy. **Patient and methods:** Twenty-four adult patients with complete rectal prolapse underwent operative treatment for the prolapse between January 2016 and December 2018. The diagnosis of rectal prolapse was made clinically and confirmed by defecation proctography. Patients underwent pre-operative colonoscopy or flexible sigmoidoscopy to exclude organic disease. Data on gender, age, mortality, morbidity, length of stay and recurrence were prospectively collected on an institutionally approved electronic database. Non-parametric data were described as median and range, while parametric data were presented as average and standard deviation.

Results: 24 patients of median age 38 (20-52 years old). Patients underwent laparoscopic ventral rectopexy. There was no mortality and 10 (13%) patients had complications. At a median follow up of 8 (2 – 12) months, two (3%) patients developed a recurrent full thickness prolapse.

Conclusions: Abdominal procedures are generally better for young fit patients. The results of all abdominal procedures are comparable. Suture and mesh rectopexy are still popular with many surgeons. The choice depends on the surgeon's experience and preference. Similarly, the procedure may be done through a laparoscope. Laparoscopic ventral or dorsal rectopexy is safe to treat full-thickness ERP. Morbidity, mortality and hospital stay are comparable with published rates with a tenfold lower recurrence.

Keyword: Rectal prolapse, Laparoscopic (anterior and posterior) rectopexy.

INTRODUCTION

Complete or full-thickness rectal prolapse is the protrusion of the entire rectal wall through the anal canal. If the rectal wall has prolapsed but does not protrude through the anus, it is called an occult (internal) rectal prolapse or a rectal intussusception [1, 2] (Figure 1).

Full-thickness rectal prolapse should be distinguished from mucosal prolapse in which there is protrusion of only the rectal or anal mucosa [3, 4]. Pre-requisites for the development of rectal prolapse are: (1) the presence of an abnormally deep pouch of Douglas [5], (2) The lax and atonic condition of the muscles of the pelvic floor and anal canal [6], (3) Weakness of both internal and external sphincters, often with evidence of pudendal nerve neuropathy [7], and (4) the lack of normal fixation of the rectum, with a mobile mesorectum and lax lateral ligaments [8].With this abnormality, the small intestine, which lies against the anterior wall of the rectum, may force the rectum out through the anal canal [9].

Complete rectal prolapse (procidentia) is the circumferential protrusion through the anus of all layers of the rectal wall. It is most common in young children and elderly adults. Rectal prolapse or procidentia is a disabling problem and controversies regarding its management continue to stimulate interest in the study of its aetiology, pathophysiology, functional aspects, and concepts of surgical management [10].

Etiology

The underlying cause of rectal prolapse remains unclear. It is thought to develop as the result of a series of functional disturbances in muscles of the anterior abdominal wall, pelvic floor, and anal sphincter complex [11].

These underlying abnormalities may be aggravated by certain conditions which appear to be associated with an increased incidence of rectal prolapse. These include connective tissue disorders, neurological illnesses, and high parity [12]. Rectal prolapse occurs at the extremes of age [13].

In the pediatric population, the condition is usually diagnosed by the age of 3 years, with an equal sex distribution. In the adult population, women are more commonly affected; the peak incidence is after the fifth decade and, representing 80% to 90% of patients with rectal prolapse [14, 15].

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 co-existing incontinence [16, 17].

Constipation is associated with prolapse in 15% to 65% of patients [18].

Straining may force the anterior wall of the upper rectum into the anal canal, perhaps causing a solitary rectal ulcer due to mucosal trauma [19].

The aim of treatment is to control the prolapse, restore continence, and prevent constipation or impaired evacuation. This goal can be achieved by: (1) resection or plication of the redundant bowel and/or (2) fixation of the rectum to the sacrum [20].

A strong and functional pelvic floor may be restored by placating the pubo-rectalis anterior to the rectum 5. The rationale for rectal fixation is to keep the

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rectum attached in the desired elevated position until it becomes fixed by scar tissue. In incontinent patients, the patulous sphincter begins to restore its tone approximately1month after the procedure, and full continence is generally restored within 2 to 3 months. Numerous procedures have been described for the

(Fig. 1) Male patient 29 y old with ERP

Treatment of rectal prolapses is generally categorized into perineal or abdominal approaches [21]. Numerous operations have been described, indicating an ongoing search for the ideal surgical approach [22]. The techniques used are divided into perineal and trans-abdominal procedures. The latter are known to have much lower long-term recurrences and better recovery of continence at the expense of higher morbidity [23, 24].

Perineal procedures therefore are frequently performed in elderly patients who may not be considered fit enough for abdominal surgery. Higher recurrence rates (up to 16% with Altemeier's and up to 38 % with Delormes procedure) and poorer functional results with unpredictable recovery of continence are accepted as a compromise [25].

The use of laparoscopic surgery in treating prolapse has challenged the classical view of management of full thickness external prolapse. Since these have adaptations of classical open procedures, recurrence rates (<5%) and functional results are comparable to open trans-abdominal operations [26]. A laparoscopic approach is associated with lower cost through a reduction in hospital stay faster patient recovery [27] and is associated with a significant reduction in morbidity [28]. Many abdominal techniques have been described, differing only in the extent of rectal mobilization, the methods used for rectal fixation, and the inclusion or exclusion of resection [29].

Mesh Rectopexy

Insertion of a foreign material during rectopexy is commonly performed with the assumption that this material evokes more fibrous tissue formation than ordinary suture rectopexy5. Materials used include fascia lata, non-absorbable synthetic meshes such as nylon, polypropy-lene (Prolene), absorbable meshes such as polyglactin (Vicryl) and polyglycolic acid (Dexon). There are 2 types of mesh rectopexy: posterior mesh rectopexy and anterior sling rectopexy (Ripstein procedure) [30].

Anterior Sling Rectopexy (Ripstein Procedure)

This operation was first described by Ripstein in 1952 [31].

Posterior Mesh Rectopexy

After rectal mobilization, a prosthetic material or mesh is inserted between the sacrum and the rectum, sutured into the rectu, then sutured into the periosteum of the sacral promontory. Although fascia lata was used in the early description of the procedure in general, it is no longer used. The sponge rectopexy, first described by Well's in 1959, involves insertion of the polyvinyl alcohol sponge prosthesis in front of the sacrum, between the sacrum and the rectum [32]. (Figure 2)

PATIENT AND METHODS

Fourteen adult patients with complete rectal prolapse underwent operative treatment for the prolapse between January 2016 and December 2018, 40 patients with a full thickness external rectal prolapse of 20 years of age or older, were operated on in Deptment of Surgery, Al-azhar University Hospitals (Al Hussein University). **The study was approved by the Ethics Board of Al-Azhar University and an informed written consent was taken from each participant in the study.**

The diagnosis of full-thickness external rectal prolapse was made clinically or when suspected, confirmed by defaecation proctography, anorectal manometry ano-scop, and colonic transit test.

Patients underwent pre-operative colonoscopy or flexible sigmoidoscopy to exclude organic disease. Anorectal manometry was performed at rest, after voluntary contraction and during straining. At defecography, resting state, voluntary and maximum contraction of the sphincter and pelvic floor muscles and straining during defecation were recorded. Rectal emptying was also assessed. X-ray films were taken in each position and dynamic assessment of defecation was also obtained.

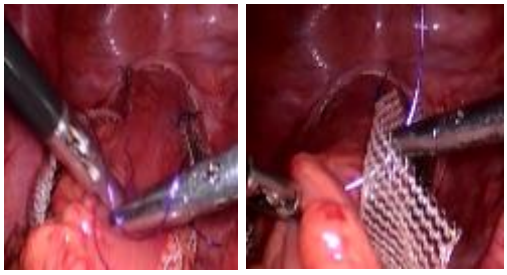

Figure (2): Lap posterior mesh rectopexy

All patients were operated on by multiple teams of surgery.

Written consent had been obtained from all the patients after a full explanation of the procedure. Approval of Department Ethical Committee was obtained. Regarding the surgical technique both (anterior or posterior mesh rectopexy) were used according to the clinical presentation and performance status of each patient. Patients were clinically assessed at the first follow up visit up to 7 days after surgery.

Subsequently they were followed up every 15 days for the first 2 months and then at 6 and 12

months. Demographic data, fecal continence and complications were recorded.

Two patients had previously undergone operations for anal problem and two patients had previously undergone two gynecological surgeries.

Surgical Technique

All patients treated by abdominal approach were given preoperatively an enema. Antibiotic prophylaxis was given before the operation.

Technique of abdominal anterior mesh rectopexy was as follows: The patient is positioned in Lloyd-Davies with hip flexion. A 30-degree laparoscope is placed in the umbilical tube. Right iliac fossa 10mm and 5mm operating ports are inserted (figure 3).

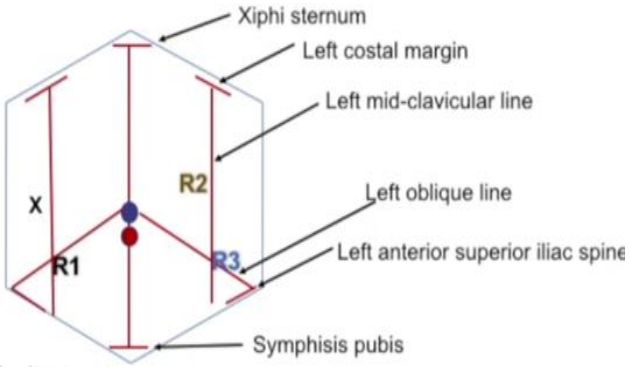

Fig. (3): Port Site in Laparoscopic Rectopexy [32].

A superficial peritoneal window is made to the right of the sacral promontory and extended caudally over the right outer border of the mesorectum down to the right side of the pouch of Douglas. This spares the right hypogastric nerve (deeper), ureter (more lateral) and avoids mobilisation of the mesorectum. The peritoneum posterior to the apex of the recto-vaginal septum is retracted postero-cranially and the vagina is retracted antero-caudally. This results in the opening of the recto-vaginal septum. A

Purely anterior rectal dissection is then undertaken down to the pelvic floor (figure 1), and its distal extent is confirmed by digital rectal and vaginal examination. A strip of polypropylene (3 x 20 cm) or polyester mesh is introduced and sutured as distally as possible on the anterior rectal wall/perineal body with interrupted non-absorbable sutures. The posterior wall of the vagina is fixed with the same sutures and to create a new recto-vaginal septum. The mesh is secured to the sacral Promontory using three Pro-tack staples.

If the vaginal wall is not fixed as described, the vaginal vault (or cervix) is fixed to the mesh without traction by two additional sutures. The mesh is then operationalized by suturing the free edges of the previously divided peritoneum over the mesh to provide additional ventral elevation and avoid small bowel adhesion to the mesh.

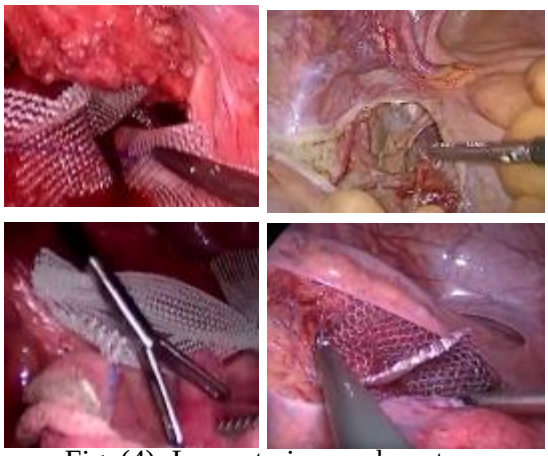

Fig. (4): Lap anterior mesh rectopexy

During follow up visits all patients were submitted to clinical examination of the perineum, rectum and vagina, digital exploration and anoscopy. The patients were followed up by clinical examination at a mean of 6–15 months after the operation for posterior mesh rectopexy and 4–12 months after the operation for anterior mesh rectopexy.

RESULTS

The surgical techniques used in treating rectal prolapse in 24 patients over a 36- month period are shown in Table 1. All procedures were performed by laparoscopic approach, and the most frequently used was rectopexy (anterior or posterior) with a mesh. 14 patients had preoperatively suffered some degree of anal incontinence. Of these incontinent patients, 9 regained continence post-operatively, leaving 2 patients with some degree of incontinence. Three patients had constipation pre-operatively as compared with 6 patients post-operatively. The proportion of patients with constipation was greater after the operation than pre-operatively (Table 1).

Table (1): Characteristics of the study groups

Point of difference	**Group I (anterior mesh rectopexy)**	**Group II (posterior mesh rectopexy)**	**P value**
Number	12	12	
Gender	M: 9 (75%); F: 3 (25%)	M: 11 (91.6%); F: 1 (8.3%)	
Approach	Laparoscopic: 12 (100%)	Laparoscopic: 12 (100%)	
Conversions to Open Approach	0	1 (12.5%)	
Operative time (minutes)	60 (32.9±40.4 min)	50 (40±45.7)	P=0.004
Estimated bleeding (mL)	14.7 (0 - 100)	14.7 (0 - 100)	P=0.1
Hospital stay (days)	3 (1 - 10)	3 (3 - 13)	P=0.08
Incidence of recurrence	0 (0%)	2 (12.5%)	

Sixteen patients (10 males 6 females, average age 42 years (range 28-49 years) underwent laparoscopic procedure with a mortality rate of 1.4%, morbidity of 0% and recurrence rate at 3 years of 12.5%. No constipation worsening was recorded. Continence improvement was recorded in 47% of patients. The follow up ranged between 6 and 12 months, there was no mortality (Table 2).

The most common complications were chest infection, port site hernia and urinary tract infection. There were no mesh related complications. There was one conversion (1%) for widespread abdominal and pelvic adhesions following a previous hysterectomy. The median length of stay was 3 (1-13) days. The median follow up was 23 (2-16) months. Six patients were lost to follow-up. Two demented patients were discharged from follow-up at 6 months. Two (12.5%) patients developed a recurrent full thickness prolapse and mucosal prolapse at 6 and 16 months. Both were re-operated by anal surgical procedures. Three patients developed symptomatic recurrent/persistent mucosal prolapse, treated with an ano-pexy.

Table (2): Complications and outcome of the study groups

Complication	Number of patients (%) (Anterior mesh rectopexy)	Number of patients (%) (Posterior mesh rectopexy)	P value
Wound infection	1 (1%)	0%	P=0.1
Urine tract infection	3 (4%)	3 (4%)	P=0.1
Chest infection	3 (4%)	1 (1%)	P=0.08
Stricture	0%	0%	
Port side hernia	3 (4%)	3 (4%)	
Sexual dysfunction	0%	3 (4%)	P = 0.852
Small bowel obstruction	1 (1%)	0%	P=0.1
Recurrence	0%	3%	P=0.1
Constipation	3%	4%	P=0.1
Persistent Incontinence	0%	3%	P=0.08
Mortality Rate	0%	0%	

Patients used medication for constipation after than before the operation, but the patients claimed less severe emptying problems after the operation. Two less severe complications following abdominal rectopexy were successfully managed conservatively small bowel obstruction and wound infection (Table 2). Our meta-analysis showed no significant difference in the recurrence rate between laparoscopic posterior rectopexy and laparoscopic anterior rectopexy (OR, 0.934; 95 percent CI, 0.457-1.910; Z value = -0.187; P = 0.852) using random effect model. Finally, our meta-analysis showed no statistical significance regarding constipation between laparoscopic anterior or posterior rectopexy (OR, 1.641; 95 percent CI, 0.547-4.926; Z value = 0.833; P = 0.377) using random effect modelling.

DISCUSSION

Scaglia et al. [32] compared 16 patients who underwent posterior mesh rectopexy with 12 who had Ripstein rectopexy. Neither procedure improved symptoms of constipation or evacuation problems. **Novell et al**. [33] compared the polyvinyl alcohol sponge technique in 31 patients with the sutured rectopexy in 32 patients. There was marginal improvement of incontinence and reduction of constipation with the suture technique. Those authors concluded that because of the small but definite risk of infection associated with the mesh procedure, it should be abandoned.

In 2001, **Benoist *et al.*** published their results of laparoscopic rectopexy in 48 patients. They evaluated laparoscopic rectopexy using mesh, suture, and resection and concluded that laparoscopic rectopexy was safe and effective. They also found that there was no difference among the 3 groups in terms of continence; mesh rectopexy conferred no advantage over suture rectopexy [34, 35].

Statistical significant difference regarding incontinence between open rectopexy and laparoscopic rectopexy (OR, 1.271; 95 percent CI, 0.607-2.659; Z value = 0.636; P = 0.525) using random effect modelling. Actually, different mechanisms of fecal incontinence in patients with rectal prolapse have been claimed: pudendal nerve neuropathy, direct sphincter trauma from the rectal intussusception, chronic stimulation of the recto-anal inhibitory reflex, and impaired rectal sensation.

Yakut *et al.* [36] evaluated their results in 94 patients in 1998. They looked at the results of the Delorme procedure and of abdominal resection with or without rectopexy. They noted that the most important complications were sexual problems in male patients who underwent posterior rectopexy procedures. They concluded that the Delorme procedure, posterior rectopexy, and resection procedures were effective surgical operations for the treatment of rectal prolapse but that extensive pelvic dissection during the posterior rectopexy might create serious sexual dysfunction in male patients.

Laparoscopic surgery has the advantages of less pain, shorter hospital stay, early recovery, and early return to work as compared with laparotomy. Apart from these advantages, the results are similar to those with the open procedures irrespective of the method used (posterior mesh). Therefore, where expertise is available, this approach may be preferred.

CONCLUSION

Laparoscopic rectopexy is preferable because it is simple and easy to perform (shorter hospital stay, quicker patient recovery, lower costs and less morbidity); the choice of an ideal operation for

complete rectal prolapse remains a per-plexing problem for the surgeon. At our institution we prefer posterior mesh rectopexy. One has to remember that success in the management of rectal prolapse is not simply the correction of the physical or mechanical abnormality; functional aspects are also important. The ideal surgical technique should, therefore, be based not only on the elements of simplicity, recurrence and complications, but should also take into account the treatment or at least alleviation of the functional disorder so commonly associated with rectal prolapse.

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