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RESEARCH ARTICLE

Functional Outcome Of Laparoscopic Rectopexy With Or Without Resection In Cases Of Complete Rectal Prolapse

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Abstract

Background: Controversies regarding the management of rectal prolapse continue to stimulate interest in the study of its surgical treatment, as there is no single operation that is suitable for every patient with prolapse. With the evolution of laparoscopic surgery, both laparoscopic resection rectopexy and laparoscopic rectopexy with sutures or with mesh without resection has been described. **This study aimed for** evaluation of the functional outcome of both operations Laparoscopic rectopexy with or without sigmoid resection in patients with complete rectal prolapse.

Patients and methods: This is a retrospective study which included the functional results of forty patients with complete rectal prolapse. Patients were divided into two groups; Group (A); were operated by laparoscopic rectopexy without resection, 8 patients were operated by suture rectopexy, and 12 patients were operated by mesh rectopexy. Group (B) [20 patients]; were operated by laparoscopic sigmoidectomy and suture rectopexy for patients who have redundant sigmoid colon. Their functional results regarding constipation, fecal incontinence, sexual and urological functions and also regarding recurrence were evaluated.

Results: Constipation improved in 76% of patients and with more improvement in patient with resection rectopexy than with mesh or suture rectopexy. Fecal incontinence improved in 75% of patients regardless of which method was used. The effect on sexual and urologic functions were not found in any of our patients post-operatively during the period of follow up No recurrence was found in any of our patients post-operatively during the period of follow up.

Conclusions: From our data we conclude that Laparoscopic surgery for rectal prolapse is a technically feasible method which resulted in improved constipation and incontinence in the great majority of patients with a significant increase in continence grade in our patients and eliminate the prolapse with nearly no recurrence. Laparoscopic surgery for rectal prolapse has the advantages of minimally invasive surgery including the shorter hospital stay, early recovery and return to work.

Introduction

Rectal prolapse (procidentia) is a socially debilitating condition where the full thickness of the rectal wall protrudes from the anus. Patients with rectal prolapse may concomitantly also experience fecal incontinence and other defecatory difficulties[13]. Associated fecal incontinence is experienced by 50% to 70% of these patients, and 25% to 50% of them have significant constipation. The goals for the surgical management of complete rectal prolapse are to eradicate the external prolapse of the rectum and to reduce the risk of recurrence without causing an adverse impact on bowel function and continence[9]. A number of surgical procedures have been developed to treat rectal prolapse, but there is still no agreement on the operation of choice. Because recurrence is generally lower with the abdominal approach, it is considered by some surgeons as the treatment of choice for rectal prolapse and resection rectopexy seems to be the best procedure as regards functional outcome. However, the need for a laparotomy wound represents a potential source of significant mortality and morbidity, which minimizes the role of transabdominal approaches in older, debilitated patients[2]**.** Laparoscopic rectopexy represents the latest development in the evolution of surgical treatment for rectal prolapse . This technique aims to combine the good functional outcome of the open abdominal procedure with the low peri- and postoperative morbidity of minimally invasive surgery[14].

Patients and Methods

This study included 40 patients that had been subjected to the following: ***Clinical history:*** including symptoms of the prolapse (as prolapsed mass, mucous discharge, bleeding per rectum or anal pain), constipation or difficult evacuation and fecal incontinence using the scale described by Browning and Parks[1] four grades of anal continence were given to describe the severity of incontinence: **Grade I:** Continence to flatus, liquid and solid stool. **Grade II:** Incontinence is to flatus, but continent to liquid. **Grade III:** Incontinence is to flatus and liquid stool. **Grade IV:** Incontinence is to flatus, liquid and hard stool (continuous fecal leakage). Also any past history of anal operation or obstetric trauma in females was considered.

Clinical examination: including general examination to assess fitness for the operation and local examination **Fig (1)** which was including *Inspection* for prolapsed mass with or without straining, patulous anus, scar of a previous operation or mucous discharge or pruritis and *palpation* for resting tone (external sphincter integrity), squeeze tone (internal sphincter integrity), sphincter relaxation during straining, ano-rectal ring, pin prick touch for examination of perianal skin sensation, ano-cutaneous reflex, rectal mass or rectocele.

Pre-operative investigations: including routine investigations to assess the patients' fitness for general anesthesia, barium enema which was done for detection of redundant sigmoid colon or other associated lesions and sigmoidoscopy which was performed for detection of prolapsing mass especially during straining and exclusion of associated lesions.

Pre-operative preparations: All patients received standard bowel preparation and preoperative antibiotic prophylaxis. In our study patients was divided into two groups: **Group A;** patients operated by laparoscopic rectopexy alone using either suture or mesh rectopexy for those with normal sigmoid colon. **Group B;** patients with redundant sigmoid colon operated by laparoscopic sigmoidectomy and suture rectopexy.

Operative procedures: **Patients position:** Patients are placed in lithotomy position with the head down tilt. **Trocar placement:** Supra-umbilical incision is made for CO_2 insufflation by Veress needle. The main working port is 10mm trocar placed low and lateral in the right iliac fossa. A third 5mm trocar is placed in the mid-clavicular plane on the right side, few centimeters below the umbilicus; this is the second working trocar. A fourth 5mm trocar is placed in the anterior axillary line few centimeters below the umbilicus, used by the assistant for traction on the left side. An optional 5mm port can be placed in the midline suprapubic region if needed. **Laparoscopic rectopexy:** Fixation is now carried by either; *Suture rectopexy:* The rectum is held on light tension using the laparoscopic Babcock forceps and two or three 2-0 non absorbable (Polypropylene) sutures are placed anchoring the mesorectum to the fascia just below the sacral promontory **Fig (2)**. *Mesh rectopexy:* A strip of polypropylene mesh about 6×10 cm tightly rolled, introduced like a cigarette, is inserted into the abdomen in the presacral space and attached to the presacral fascia and sacral promontory periosteum using non absorbable 2-0 (Polypropylene) or delayed absorbable (polyglactin 910) stitches. After determing that the mesh was firmly attached to the sacrum, the rectum was held under tension and the mesh was fixed to the seromuscular lateral wall of the rectum using three non absorbable 2-0 (Polypropylene) or delayed absorbable (polyglactin 910) stitches. *Colopexy:* It is an additional step, which was performed by fixing the stretched pelvic colon to the peritoneum and other abdominal wall layers in the left iliac fossa through small 3-4cm incision in the left iliac fossa **Fig (3)**. **Laparoscopic assisted resection rectopexy:** The rectum is held stretched tight in a cephalad direction to choose the appropriate level of resection at the pelvic brim.

The peritoneum over the mesorectum is then divided at this level, and the avascular plane is developed between the rectum and mesorectum. The rectum is divided first, with a 30mm to 35mm endoscopic stapler (Endo GIA II Autosuture European Services staple length, 3.8mm). Usually two serial applications of the bowel stapler are required to traverse the rectum. The divided proximal end of the colon is now held with atraumatic grasper and delivered via a 40 to 50 mm muscle splitting incision in the left iliac fossa. The specimen of the colon is divided 50mm above the skin, and the anvil of a 33mm circular stapler (Premium Plus CEEA-Auto Suture Company) is secured with a 2-0 (Polypropylene) purse string suture. The shaft of the circular stapler is passed per rectum, and the spike was brought through the stapled rectal stump adjacent to the staple line. The anvil is then docked onto the spike, and the anastomosis is done under direct vision. With use of a two or three 2-0 non absorbable (Polypropylene) sutures are placed anchoring the mesorectum to the fascia just below the sacral promontory, just distal to the anastomosis. The anastomosis is checked with a rigid sigmoidoscope for homeostasis and integrity **Fig (4)**.

Post-operative care: Oral intake is started when there is good intestinal sounds, usually on the next morning starting with liquids in cases of rectopexy alone, while in cases of resection rectopexy patients are kept nil by mouth till the third post-operative day. During the next two weeks post operatively, non-stimulant laxatives are used along with instructions to avoid excessive straining at defecation, thereafter the use of laxatives is determined according to the degree of recovery of bowel function. Defecation is resumed in the normal sitting position.

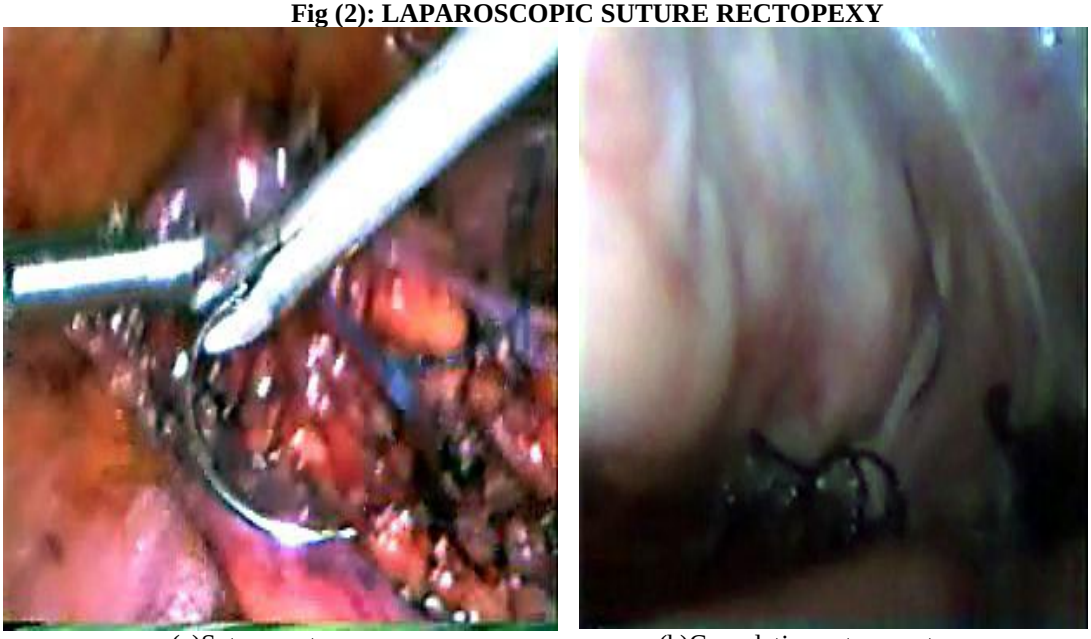
Surgical outcome: The operative technique is assessed, evaluating the following parameters: feasibility and easiness of the technique, operative time, time for passage of flatus, postoperative hospital stay and time to return to normal activity.

Follow Up: Patients are followed up postoperatively for a period of two years to evaluate the following parameters: improvement or persistence of symptoms of prolapse, recurrence and its type (complete or partial), changes in constipation and difficult evacuation, changes in anal incontinence if it was present pre-operatively and effect on sexual function by asking about; impotence and retrograde ejaculation in males. All of the above collected data are subjected to analysis to obtain the relevant results.

Results

Fig (1): Complete rectal prolapse (PRE-OPERATIVE)

Fig (2): LAPAROSCOPIC SUTURE RECTOPEXY



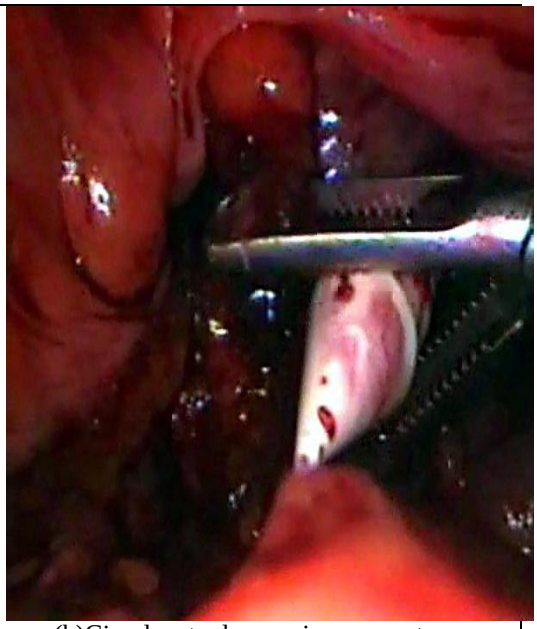
(a)Suture rectopexy (b)Completing suture rectopexy

Fig (3): LAPAROSCOPIC MESH RECTOPEXY

(Presacral placement of the mesh)

Fig (4): LAPAROSCOPIC RESECTION RECTOPEXY

(a)Application of the endoscopic stapler



(b)Circular stapler passing per rectum

All patients underwent laparoscopic repair (rectopexy or resection rectopexy) and were followed up for a period of two years. The preoperative, operative and postoperative data were collected, analyzed and the following results were obtained. The mean age of patients in our study was 47.1 (range 17-66) years and male to female ratio was 11-9. The most common presenting symptoms were the prolapsing mass (100%) and anal pain (70%), while the incontinence represented the least incidence (30%). Two patients of all 18 female patients (11.1%) had multiple vaginal deliveries with a prolonged last labor, while one patient (5.5%) had multiple vaginal deliveries with a history of perineal tear **Fig (5)**.

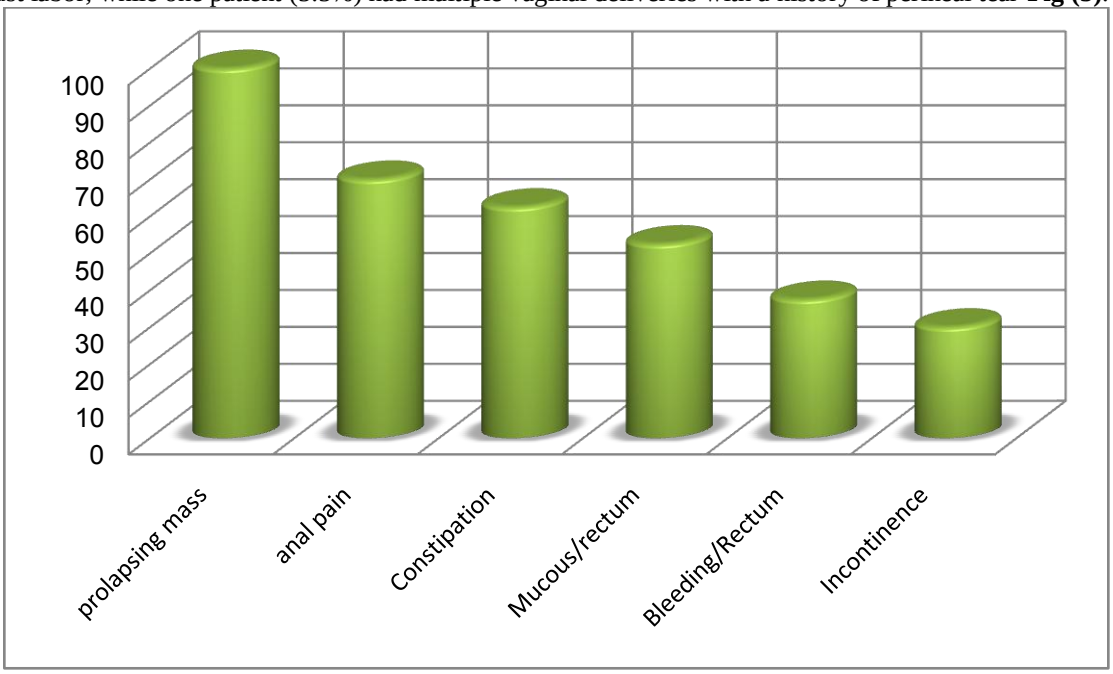


Fig (5): percentage of the presenting symptoms

One patient (2.5%) had a history of perineal repair for rectal prolapse 30 years ago (the nature of the operation was not specified) followed by recurrence two months later, while four patients (10%) had history of anal fistula operation 5years ago. The most common findings on patients examination was the prolapsing mass on straining (100%), with 14 patients (35%) have patulous anus, 12 patients (30%) have poor sphincter tone, while scar of fistula operation, 14 patients, represented the least incidence (10%). Both laparoscopic rectopexy and resection rectopexy were successfully performed and completed in all patients **Table (I)**. Group (A) patients [20 patients]; were operated by laparoscopic rectopexy without resection, 8 patients were operated by suture rectopexy, and 12 patients were operated by mesh rectopexy. Group (B) patients [20 patients]; were operated by laparoscopic sigmoidectomy and suture rectopexy for patients who have redundant sigmoid colon.

Table (I): Surgical parameters

SURGICAL PARAMETERS ITEMS	RECTOPEXY		RESECTION RECTOPEXY	
	Range	Mean	Range	Mean
Operative time in minutes	90-210	149	180-330	256
Time for passage of flatus in days	1-3	1.9	2-4	2.5
Postoperative hospital stay in days	2-5	2.6	5-9	7
Return to normal activity in days	10-15	12.8	14-21	17.65

All the 40 patients (100%) who were complaining of prolapsed mass improved postoperatively, 2 patients (7.14%) of the 28 patients (100%) who were complaining of anal pain pre-operatively persisted post-operatively and 3 patients (20%) of the 15 patients (100%) who were complaining of bleeding per rectum pre-operatively persisted post-operatively **Table (II)**.

Table (II): Post-Operative Symptomatic Outcome

Symptoms	Total Number and percentage of patients complaining	Number and percentage of patients persisted post-operatively	Number and percentage of patients improved post-operatively
Prolapsed mass	40 (100%)	0 (0%)	40 (100%)
Anal pain	28 (70%)	2 (7.14%)	26 (92.86%)
Bleeding/ rectum	15(37.5%)	3 (20%)	12 (80%)

Totally 25 patients (62.5%) were complaining from constipation or difficult evacuation pre-operatively; 11 patients [out of the 25 patients *(i.e.; 44%)*] were in group (A) and operated by laparoscopic rectopexy alone and 14 patients [out of the 25 patients *(i.e.; 56%)*] were in group (B) and operated by laparoscopic resection rectopexy. Constipation improved in 19 patients **(76%)**; 7 patients [out of the 11 patients *(i.e.; 63.6%)*] were operated by laparoscopic rectopexy alone (group A) and 12 patients [out of the 14 patents *(i.e.; 85.7%)*] were operated by laparoscopic resection rectopexy (group B); and persisted in 6 patients **(24%)**. New onset constipation developed in 2 patients from group (A) who were improved by fiber enriched diet and mild laxative **Table (III)**.

Table (III): Constipation and symptoms of difficult evacuation

Constipation	Number of patients	Percentage of patients (%)
Total patients complaining pre-operatively	25	100%
Patients improved post-operatively	19	76%
Patients persisted post-operatively	6	24%
Newly complaining patients post-operatively	2 (out of 40 patients)	5%

12 patients (30%) were complaining from incontinence pre-operatively. Fecal incontinence improved in 9 patients [out of the 12 patients *(i.e.; 75%)*], and persisted in 3 patients [out of the 12 patients *(i.e.; 25%)*]. One patient showed only a mild improvement, while there was a marked increase in continence in eight of the nine patients who suffered from either grade IV or grade III incontinence before operation. The other 28 patients were continent before surgery and remained so afterward during the period of follow up **Fig (6)**. The effect on sexual and urologic functions was not found in any of our patients post-operatively during the period of follow up. There was no recurrence found in any of our patients post-operatively during the period of follow up.

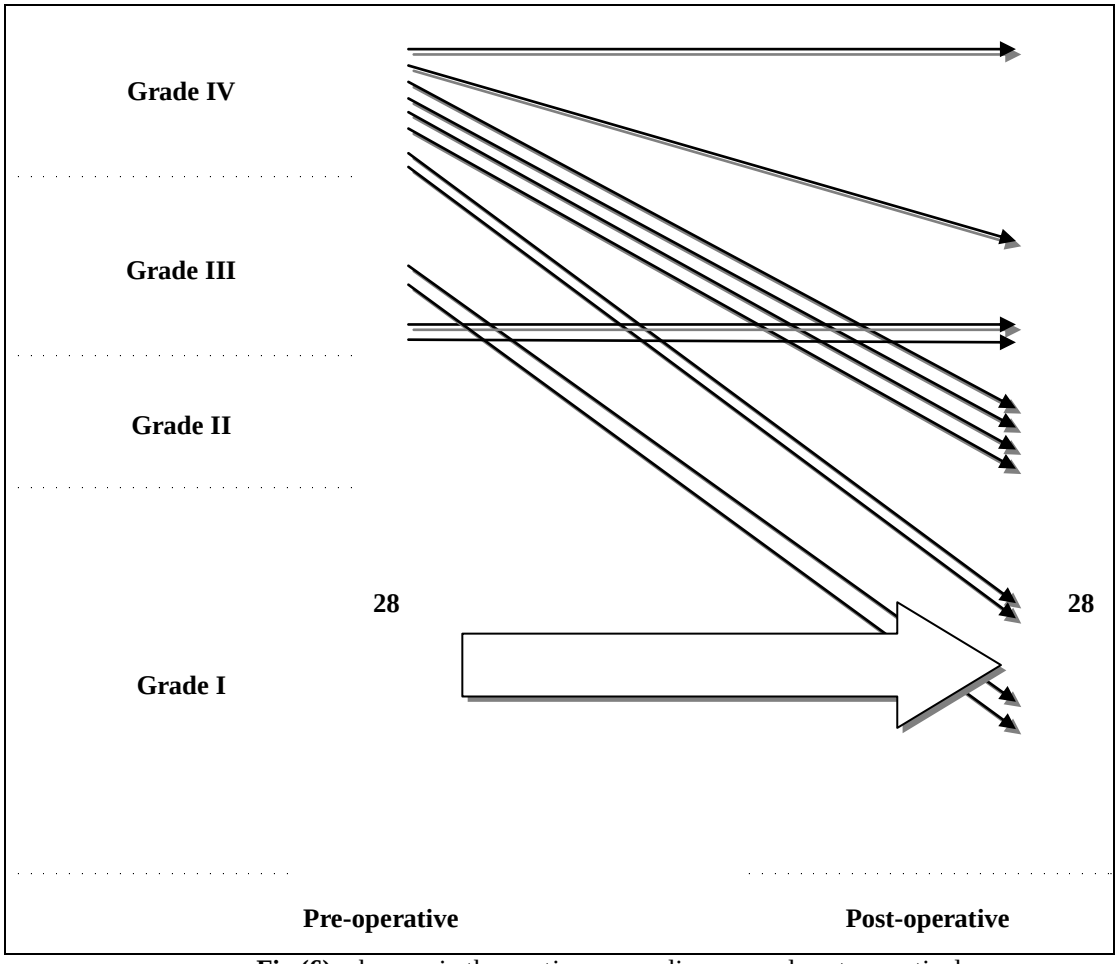


Fig (6): changes in the continence grading pre and post-operatively

Discussion

Although considerably in excess of 100 different surgical techniques have been reported for the treatment of rectal prolapse, there is a common consensus that transabdominal fixation procedures, with or without resection, offer better functional results and lower recurrence rates. Despite this, perineal procedures, which can be performed under spinal or epidural anesthesia, are often given preference in very old and high-risk patients. The development of minimally invasive surgery has changed the scene as laparoscopic rectopexy or resection rectopexy can be accomplished safely[4]. Rectal prolapse tends to occur most commonly in elderly, as the mean age of patients in most studies varies from 61 years (range 24-94 years) [16], 62 years (range 23-88 years) [3], 72 years (range 37-89 years) [6], to 73 years (range 57-86 years) [15]. However, in our study it tends to occur in younger group as the mean age was 47.1 years (range 17-66 years), and this is in correspondence to some authors, 45.8 years (range 25-82 years) [8], and 51.5 years (range 20-87 years) [11]. Also, rectal prolapse has been reported to occur more commonly in females with a female to male ratio varying from 4:1 [8], to 17:1 [3] and 29:1 [16]. However, in our thesis rectal prolapse tends to occur more slightly in male patients with a female to male ratio of 1:1.22. The associated functional disorders in this thesis were mainly constipation or symptoms of pelvic outlet obstruction (62.5%) and incontinence represented only (30%), and this is in correspondence to some authors; (50%) with constipation and (20.8%) with incontinence[12], and (52.5%) with constipation and (45%) with incontinence[5]. However, other authors reported higher association of complete rectal prolapse with incontinence rather than with constipation; as it was (66.7%) with incontinence and (46.7%) with constipation[16], and (53.7%) with incontinence and (37%) with constipation and outlet obstruction[1]. Laparoscopic rectopexy (suture or mesh) and laparoscopic assisted resection rectopexy are successfully feasible with the following surgical parameters in this study: The mean operative time was 149 (range 90-210) minutes in rectopexy and 256 (range 180- 330) minutes in resection rectopexy, however a reduction in operating time is noticed with increasing our experience. These results were similar to other series; as the mean operative time was 258 (range 150-380) minutes in resection rectopexy[3], 143 (range 90-300) minutes in suture rectopexy and 215 (range 180-260) minutes for resection rectopexy[11]. Moreover, it was 126 (range 92-175) minutes in rectopexy and 222.8 (range 145-330) minutes in resection rectopexy[5], and 150 (range 90-295) minutes for rectopexy and 255 (range 180-360) for

resection rectopexy[10]**.** The mean postoperative hospital stay in our study, it was 2.6 days (range 2-5 days) in rectopexy and 7 days (range 5-9 days) in resection rectopexy. This was in accordance with the results of other studies; 3 days (range 1-5 days) in rectopexy and 6.1 days (range 3-13 days) in resection rectopexy[5], 4 days (range 2-10 days) in rectopexy[8]**.** The mean time to return to normal activity in our study it was 12.8 days (range 10-15 days) in rectopexy and 17.65 days (range 14-21 days) in resection rectopexy, and this was similar to other study; 14 days (range 12-21 days) following both rectopexy and resection rectopexy[10]**.** In this study; totally 25 patients (62.5%) were complaining from constipation or difficult evacuation pre-operatively; 11 patients [out of the 25 patients *(i.e.; 44%)*] were in group (A) and operated by laparoscopic rectopexy alone and 14 patients [out of the 25 patients *(i.e.; 56%)*] were in group (B) and operated by laparoscopic resection rectopexy. Constipation improved in 19 patients **(76%)**; 7 patients [out of the 11 patents *(i.e.; 63.6%)*] were operated by laparoscopic rectopexy alone (group A) and 12 patients [out of the 14 patents *(i.e.; 85.7%)*] were operated by laparoscopic resection rectopexy (group B); and persisted in 6 patients **(24%)**. This was in accordance with the results of other studies; constipation was improved in 64.3% of patients operated by laparoscopic rectopexy while it was improved in 85.7% of patients operated by laparoscopic resection rectopexy[5], 90.9% of constipating patients improved by laparoscopic resection rectopexy[12]**.** Moreover, **Benoist et al (2001)** stated that post-operative constipation was significantly less after laparoscopic resection rectopexy than after either laparoscopic mesh or suture rectopexy[2]. As regarding incontinence in our study 12 patients (30%) were complaining from incontinence pre-operatively. Fecal incontinence improved in 9 patients [out of the 12 patients *(i.e.; 75%)*], and persisted in 3 patients [out of the 12 patients *(i.e.; 25%)*]. This was in accordance with the results of other studies; 75% of patients presenting with fecal incontinence were improved by laparoscopic rectopexy whatever the procedure used[2], incontinence was improved or completely removed in 64% of patients[3]**.** Moreover, incontinence was improved in 77.8% of patients[15], in 70 % of patients[16], and improved in 83.3% of patients regardless of which procedure used[5]**.** As regarding recurrence in our study no recurrence was found in any of our patients post-operatively during the period of follow up. This was in correspondence to many authors; there have been no recurrences following laparoscopic rectopexy without resection[8], no recurrence was detected for laparoscopic suture rectopexy without resection[6], no recurrence was recognized regarding laparoscopic surgery for complete rectal prolapse whatever the procedure used[5]**.**

Conclusion

Laparoscopic surgery for rectal prolapse is a technically feasible method which resulted in improved constipation and incontinence in the great majority of patients and eliminate the prolapse with nearly no recurrence. The addition of laparoscopic colopexy helps to decrease the recurrence rate. Laparoscopic surgery for rectal prolapse has the advantages of minimally invasive surgery including the shorter hospital stay, early recovery and return to work.

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