

Evaluation of the Protective Role of Proximal Diverting Stoma in Low Anterior Resection for Rectal Cancer

Ahmed Samy Fahmy, Hazem Mohamed Sobieh, Mohammad Samy Kharob, Abd Elghany Abd Elghaffar Abd Elkader

General Surgery Department, Faculty of Medicine, Benha University, Egypt
Dawdedo80@gmail.com

Abstract: Background:-Low anterior resection (LAR) with or without diverting stoma is a complete surgical removal with adequate safety margins, with the attempt of achieving a cure. This can either be done by laparotomy or laparoscopy plus importance of proximal diverting stoma to minimize rate of complications. **Purpose:**-Evaluation of protective role of proximal diverting stoma in low anterior resection against the anastomotic leakage in cases of rectal carcinoma. **Patients and methods:**-In this study, Fifty patients had are sectable, non- obstructed cancer rectum and not less than 6 cm from anal verge underwent low anterior resection. These patients subdivided into two groups -Group A, underwent low anterior resection (LAR) had proximal protective stoma. Group B, underwent (LAR) without proximal stoma. **Results:**-The study included 50 patients coming for LAR. They were 25 females and 25 males. The age of the patients ranged from 26 years to eighty years (average 53 years). The anastomotic leakage rate diminished in group A than group B because diverting stoma protect against leakage At group B there is 32 patients admitted to LAR without any stoma 3 patients complicated by leakage i.e.9.4% and P value was (0.180). Evaluation of the outcome in patients underwent (LAR) and follow up in the outpatient clinic for 3 months according this parameter: Hospital staying days-Post-operative anastomtic leakage - Surgical site infections and Functional complications-Stomal complications (regarding to the first group). **Conclusion:**-Proximal diverting stoma play an important role in reducing the incidence of anastomotic leak also low anterior resection (LAR) still the standard treatment of mid and high rectal carcinoma, despite of different modalities of treatment of cancer rectum, there are other important factors that influence the outcome of LAR as the surgeon's experience, general condition of the patient, pre-operative colonic preparation as well as the meticulous technique of anastomosis. All this factors have greater impact on the post-operative sequel after LAR.

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Keywords: Diverting stoma, Low anterior resection, early management of cancer rectum.

1. Introduction

Approximately 42,000 patients each year are diagnosed with rectal cancer in the United States. Approximately 8500 die of this disease. the current management of rectal cancer is now more variant and complex because multimodality therapy⁽⁴⁾.

Colorectal Cancer incidence rates have declined about 2 to 3 percent per year over the last 15 years in USA⁽²⁾. Incidence rates in most other western countries have been stable or increased slightly during this period⁽³⁾.

Mortality rates from CRC have declined progressively since the mid-1980s in the United States and in many other western countries⁽²⁾.

This improvement in outcome can be attributed, at least in part, to detection and removal of colonic polyps, detection of CRCs at an earlier stage, and more effective primary and adjuvant treatments⁽⁵⁾. Results of surgical treatment are better for cancer of the colon than that of the rectum and rectal cancer below the pelvic peritoneal reflection has a worse prognosis than cancer higher in the rectum. The stage

of disease is the most important determinant of survival rates after surgical resection⁽⁶⁾.

In LAR the sigmoid colon and entire rectum are removed. The descending colon is anastomosed to the anal canal, about 5-6 cm from the anal verge. This technique allows complete removal of the mesorectum, leaving a small amount of rectum sufficient to attain an end-to-end anastomosis, using a stapling device. Where possible the autonomic nerves are preserved to protect sexual function, providing that all evidence of tumor can be safely removed. The current management of rectal cancer is now more variant and complex because multimodality therapy⁽⁶⁾.

Protective stoma can support the patient undergoing LAR against complications depending on surgeon experiences and will not be helpful for all the patients and not recommend routinely. Beside this, male gender and low anastomosis, coronary artery disease, preoperative radiotherapy, and smoking are the major risk factor of anastomotic leakage while type of sutures does not seem to play a significant role in this regard⁽⁷⁾.

Low anterior resection (LAR) with a total mesorectal excision (TME) is the current gold standard surgical technique that is generally used for the mid and some lower level rectal cancers⁽⁸⁾. Recent advances in surgical techniques and neoadjuvant therapy have reduced the tumor recurrence rate after resection and, at the same time, provided a better chance to preserve the sphincter in rectal cancer patients whose tumor is situated in the lower rectum⁽⁸⁾.

Patients and methods:-

All the patients who participated in this study had carcinoma of rectum.

The age of the patients ranged from 26 years to 80 years (average age 53 years). There were twenty five female patients and twenty five male patients.

Inclusion criteria:

The study included all patients presented by rectal carcinoma who were candidate for low anterior resection at Benha University Hospital and Tanta Cancer Center.

Exclusion criteria:

1. Patients with medical diseases who cannot tolerate anesthesia i.e. Surgically unfit.
2. Un-resectable rectal carcinoma.
3. Obstructed rectal carcinoma.
4. Rectal carcinoma less than 6cm from the anal verge.
5. Patients who refuse participating in this study.

Preoperative assessment

Clinical symptoms:

All my patients in this study underwent complete history taking and clinical examination. Total number of my patients is 50 presented by one or more of the following symptoms⁽¹⁾:-

1. Bleeding per rectum was about (44%).
2. Change bowel habits and constipation was about (43%).
3. Abdominal pain and mass was (40%).
4. General body weakness was about (20%).
5. Unexplained anemia was about (11%).
6. Loss of weight was about (6%).

Pre-operative investigations and diagnosis of CRC:-

All patients underwent the following pre-operative work up:-

1. Complete history taking.
2. Complete general and local examination of the whole body.
 - Full investigations including:-
 - Colonoscopy and Clonoscopy guided biopsy.
 - Biopsy and histo-pathological study & diagnosis.
3. Radiological investigations as:-
 - Contrast CT abdomen pelvis.

- Endorectal ultrasonography (ERU).
 - Chest X ray.
4. Routine laboratory investigations including:-
 - Complete blood picture.
 - Coagulation profile.
 - Liver and kidney function testes
 5. Tumors markers CEA, CA19.9 and Alkaline phosphatase.

*CT films of male patient aged 59 years old diagnosed as resectable rectal cancer & admitted to Tanta Cancer Center from this study as shown at Image (1).

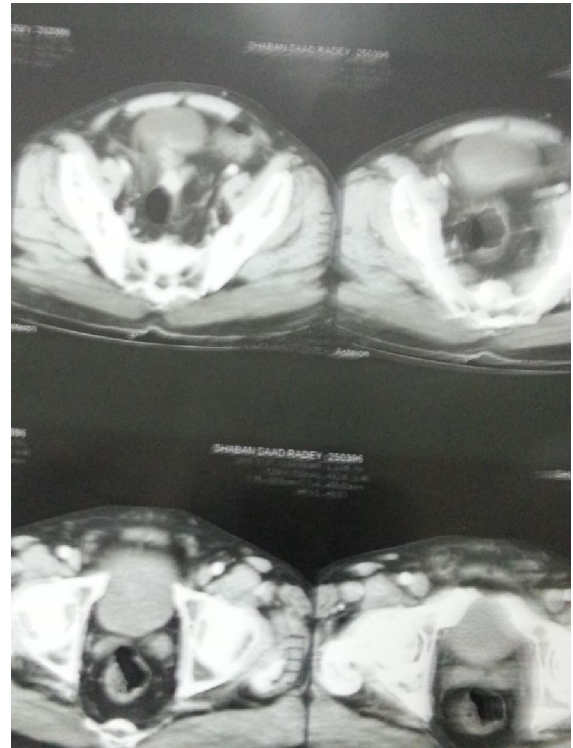


Image. (1): Contrast CT before operation showing rectal mass.

* Pre-operative preparation including:-

1. Markings sites of stoma for all patients underwent to LAR.
2. Ureteric stenting for patient with obstructive nephropathy.

3-Pre-operative colonic preparation⁽¹¹⁾.

The patients were admitted to the hospital three days before operation. The pre-operative preparation may be mechanical preparation there are several methods used to mechanically cleanse the large intestine. These include a diet of clear liquids 1–3 days before surgery combined with one of the following: laxatives, enemas, whole gut irrigation with saline via a naso-gastric tube, mannitol solutions, polyethylene

glycol (PEG) electrolyte lavage solutions, or PEG-based tablets

Operative technique

Anesthesia:

General anesthesia is the role sometimes combined with epidural anesthesia to relieve pain within limits post-operative About 15 patients from 50 taking combined, general anesthesia with epidural anesthesia aiming for decreasing anesthetic morbidity, to improve the post-operative pain control.

(POPC). A conformed oral endotracheal tube fixed on the chin in the midline. A low mean arterial pressure was maintained during surgery to maintain a dry surgical field.

*Step by step of operation low anterior resection (LAR) ⁽⁹⁾⁽¹⁰⁾.

Starting by midline laparotomy. Inspection abdomen, check for metastasis.

Mobilizes sigmoid and descending colon (incise along Toldt's white line).

Then identify and preserve left ureter- Transect sigmoid colon -Divide mesosigmoid.

Identify and ligate superior rectal artery (low tie strategy)-Excise mesorectum and preserve sacral plexus-Incise peritoneum 1 cm ventral to peritoneal fold.

Identify and preserve seminal vesicles / uterus and vagina.

Dissect at least 2 cm distal to tumor- Divide mesorectum towards rectum-Transect rectum-Create tension free side-to-end anastomosis-Perform leak test if desired-

Then put 3 Nelton catheter (drains) one at pelvis around anastomosis second at hepatic or splenic bed but the third drain at subcutaneously between anterior abdominal wall and fascia-Create deviation stoma (ileostomy or colostomy) in group A-

lastly Close the fascia and skin.

How to do stoma:-

a-An opening made at one side of incision of anterior abdominal wall at the site which was marked pre-operatively.

b-Mobilize ileum or colon to the anterior abdominal wall.

c- Fix serosa of ileum or colon to anterior abdominal wall.

d- Fix mucosa of intestine to skin surface of anterior abdominal wall

3. Results:-

The results will be studied in these points:

A-Patient distribution including:-

1- Age of patients.

2- Gender of patients.

B- Pathology of the resected rectal mass.

C- Post-operative follow up including:-

1- Duration of post-operative hospital stay.

2- Post-anastomotic leakage.

3- Post-operative complications as infection, recurrence and stenosis.

4- Functional complications.

5- Stomal complications in group (A).

*The study focus on post-operative complications and follow up.

Post-operative follow up:

1- Duration of post-operative hospital stay:

The duration of post-operative hospital stay was ranged from 10: 21 days. Group B showed statistically significant less duration of hospital stay in comparison with group A. The results are illustrated in table (1) fig. (1).

Tab (1): Comparison of group A & B outcome in relation to staying days at hospital.

Stayintag days	Group A	Group B
Range (days)	12 – 21	10 – 19
Mean±SD	16.61±2.59	14.97±1.96
T. test	6.395	
P. value	0.015*	



Fig. (1): Comparison of group A and group B outcome in relation duration of staying days at hospital.

2- Surgical site infection:

Out of the 50 patients, only one case was complicated by superficial surgical site infection, and this case belonged to group A. This case was managed by drainage of the wound and daily dressings, then left to heal with secondary intention (see fig (2) table (2)).

Tab (2) Comparison group A and group B outcome in relation to site of Infection

Complication		Group A	Group B	Total
Non infected	N	17	32	49
	%	94.5%	100.0%	98.0%
Infection	N	1	0	1
	%	5.6%	.0%	2.0%
Total	N	18	32	50
	%	100.0%	100.0%	100.0%
Chi-square	X ²	1.812		
	P-value	0.178		

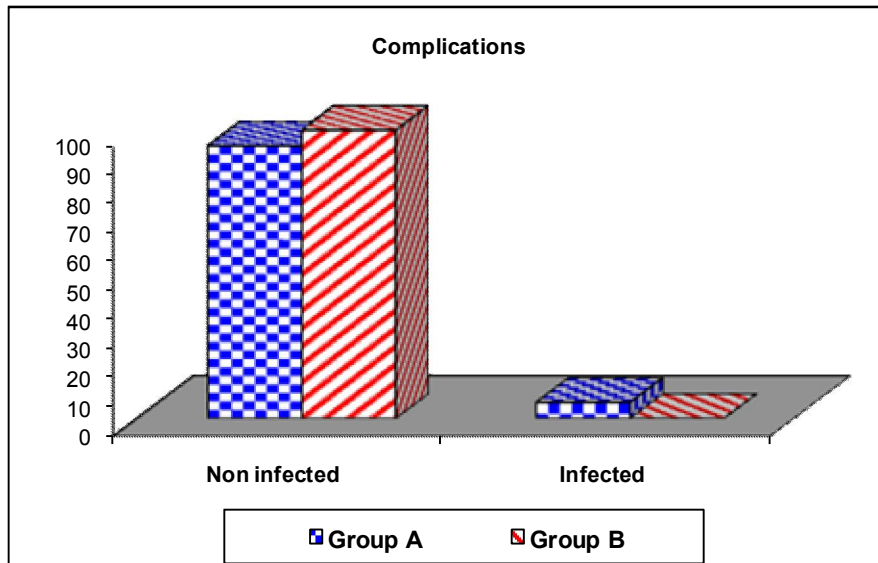


Fig. (2): Comparison group A and group B outcome in relation to Infection.

3- Functional complications:

There were no sexual nor urinary functional complications in the 50 included patients. However, there were 2 cases in group B were complicated by temporary fecal incontinence, those 2 cases showed complete improvement within the period of post-operative follow up. The functional complications are listed in table (3) Fig. (3).

Tab (3): Study relation between functional complication and both groups A and B.

Functional complications	Group A	Group B	Total	
Continent	N	18	30	48
	%	100.0%	93.75%	96.0%
Incontinent	N	0	2	2
	%	.0%	6.25%	4.0%
Total	N	18	32	50
	%	100.0%	100.0%	100.0%
Chi-square	X ²	3.704		
	P-value	0.054		

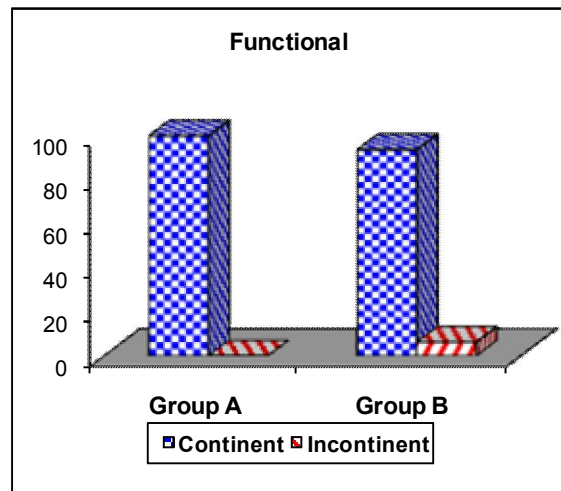


Fig. (3): Study relation between functional complication and both groups A and B.

4- Anastomotic leakage:

Although there were 3 cases in group B complicated by anastomotic leakage, yet, there is no

statistically significant value in the rate of anastomotic leakage of the two studied groups. The 3 complicated cases were managed as two of them pass conservatively there were low output and totally drained via the pelvic drains. But the third patient only was indicated for re-exploration (re-operation) the indication of abdominal re-entry was development of peritonitis abdominal exploration was done the anastomosis was found to be disrupted peritoneal toilet

done, terminal ileostomy. & closure of distal rectal stump also were done, While the other 2 complicated patients were not indicated for intervention, as the fistulae were low out put, totally drained via pelvic drains & respond well to conservative measures At group B there is 32 patients admitted to LAR without any stoma 3 patients complicated by leakage i.e.9.4% and P value was (0.180). (see table (4) and fig (4)).

Tab (4) Leakage relation between group A & second group B.

Leakage		Group A	Group B	Total
Yes	N	0	3	3
	%	0.0%	9.4%	6.0%
No	N	18	29	47
	%	100.0%	90.6%	94.0%
Total	N	18	32	50
	%	100.0%	100.0%	100.0%
Chi-square	X ²	1.795		
	P-value	0.180		

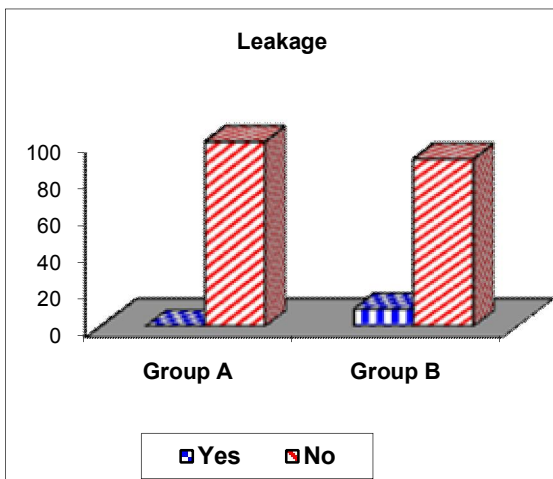


Fig (4): Leakage relation between group A & second group B.

Tab (5): Study relation between different types of stomal complications in group A.

Stomal complications	N	%
Normal stoma	14	78
Retracted	1	5.5
Prolapsed	2	11
Ischemic & Gangrene	1	5.5
Total	18	100

5-Stomal complications:

There were 4 cases in group A complicated by stomal complications in the form of prolapsed stoma (2 cases), retracted stoma (1 case) and gangrenous stoma (1 case). All of those 4 patients were managed

via surgical refashioning of the stoma (see table (5) fig. (5)).

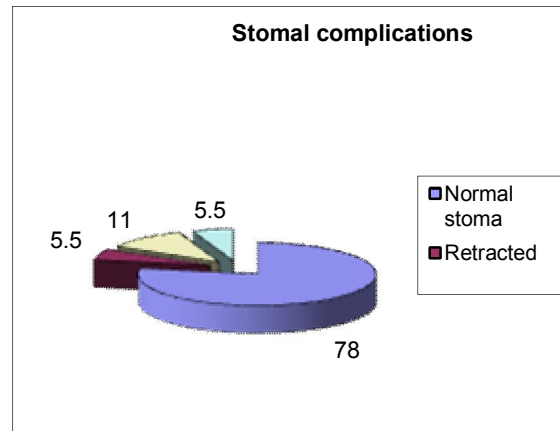


Fig (5) study relation between different types of stomal complications (retraction-prolapse-ischemia) in group A.

The results of this study showed that:

1- Proximal stoma in LAR failed to achieve any protective role regarding post-operative hospital stay, surgical site infection or recurrence rate furthermore, LAR without proximal stoma was associated with less hospital stay.

2- The average stomal complications rate was about 22% in the form of stomal prolapse, retraction and ischemia.

3- Proximal stoma had a role in diminishing anastomotic leakage however; it had no statistically significant value.

4- Protective stoma in LAR also had important impact in decreasing the rate of re-exploration.

Conclusions:

Low anterior resection is the standard treatment of mid and high rectal carcinoma. The creation of proximal diverting stoma is still a matter of debate & controversy although proximal diverting stoma is still having a role in minimizing the rate of anastomotic leak, however it failed to achieve statistically significant value neither in preventing this complications nor in diminishing rate of re-exploration.

Proximal diverting stoma has no statistical significance in improvement of hospital stay, surgical site infection, functional complications and incidence of recurrence.

Despite of the role of proximal diverting stoma in reducing the incidence of anastomotic leak, there are other important factors that influence the outcome of LAR as the surgeon's experience, general condition of the patient, pre-operative colonic preparation as well as the meticulous technique of anastomosis. All this factors have greater impact on the post-operative sequel after LAR.

The study conclude that:-

a) Proximal diverting stoma has no statistical significance in improvement of hospital stay, surgical site infection, functional complications and incidence of recurrence.

b) Despite of the role of proximal diverting stoma in reducing the incidence of anastomotic leak, there are other important factors that influence the outcome of LAR as the surgeon's experience, general condition of the patient, pre-operative colonic preparation as well as the meticulous technique of anastomosis. All this factors have greater impact on the post-operative sequel after LAR.

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