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Clinical Prospective Study of Post-Operative Morbidity and Mortality After Low Anterior Resection with Preventive Diverting Loop Ileostomy in Patients of Rectal Cancer

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Abstract

Background: Rectal cancer continues to be devastating malignancy worldwide. Faecal diversion is an important tool in the surgical management of rectal cancer. The presence of stoma may also increase the risk of complications related to stoma itself (high stoma flow, retraction, prolapse, kidney failure, skin excoriation etc.).

Aims: To measure postoperative morbidity and mortality after low anterior resection with preventive diverting loop ileostomy in patients of rectal cancer

Material and methods: This is a prospective study and was carried out between december 2021 to November 2022. Total 28 patients who underwent LAR with Diversion stoma were included according to pre-defined inclusion and exclusion criteria.

Results: Male to female ratio was 1.8:1.Mean age was 57.92±15.85 years. 1 (3.57%) patient had anastomotic leak, 3 (10.71%) had wound infection, 6 patients (21.42%) had chest infection, 1 (3.57%) patients pelvic collection, 9(32.15%) patients had electrolyte imbalance, 2(7.14%) patients had ileus. Mean hospital duration during primary surgery of patients was 11.46±2.47. Mean Post stoma closure hospital stay was 5.84 (±1.57) days. Out of total 28 patients 1(3.57%) patient died, 25 (89.29%) patients underwent subsequent stoma closure. Rest 2(7.14%) patients had their ileostomy as a permanent stoma.

Conclusions: Decision to create or not to create diversion stoma should be on case to case basis upon operating surgeon's discretion with shared information to patient and his/her family with their involvement in decision making.

Keywords: Rectal cancer; Diversion stoma; LAR.

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INTRODUCTION

Rectal cancer continues to be devastating malignancy worldwide. The cumulative lifetime risk of developing colorectal cancer is about 6%. Sphincter preservation is the need of the hour.

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The standard potentially curative treatment option for rectal cancer is surgery, which is often combined with preoperative radiotherapy or chemoradiotherapy.[1] Low anterior resection (LAR) is generally performed for lesions in the upper third of the rectum, middle and occasionally for lesions in the lower third. In 1982 Heald introduced the total mesorectal excision (TME) that has become the standard technique to dissect in anatomical planes with the aim to obtain a complete removal of mesorectum with intact mesorectal fascia. The survival of rectal cancer patients undergoing LAR has been prolonged with the utilization of TME and NCRT (Neo-adjuvant chemo radio therapy). On the other hand, these modalities are often associated with a high frequency of anastomotic dehi scence.[2,3]

Despite improvements in surgical technique and development of modern equipment including laparoscopic surgery, TME with primary anastomosis is still associated with a significant risk of symptomatic anastomotic leakage (AL) ranging between 3% and 24%.[4,5]

The rate depends mainly on the tumor size and location, neo-adjuvant irradiation and patient's general status (male gender, malnutrition, steroid use, obesity and advanced age are all associated with increased risk). [6]

Faecal diversion is an important tool in the surgical armamentarium. A loop ileostomy is constructed to protect a distal colonic anastomosis. Stoma related complications can occur following both the construction and the closure of the stoma and adversely affect the primary surgery.

The presence of stoma may also increase the risk of complications related to stoma itself (high stoma flow, retraction, prolapse, kidney failure, skin excoriation etc.). A high body mass index (BMI), diabetes, use of steroids and immunosuppressive therapy, surgical technique and length of time between construction and closure are factors considered to pre-dispose to stoma related complications. Additionally, these patients require another surgery, which also involves the risk of complications and not all patients undergo surgical closure of the stoma. [7]

AIMS AND OBJECTIVES

Study was conducted to measure postoperative morbidity and mortality after low anterior resection with preventive diverting loop ileostomy in patients of rectal cancer

MATERIAL AND METHODS

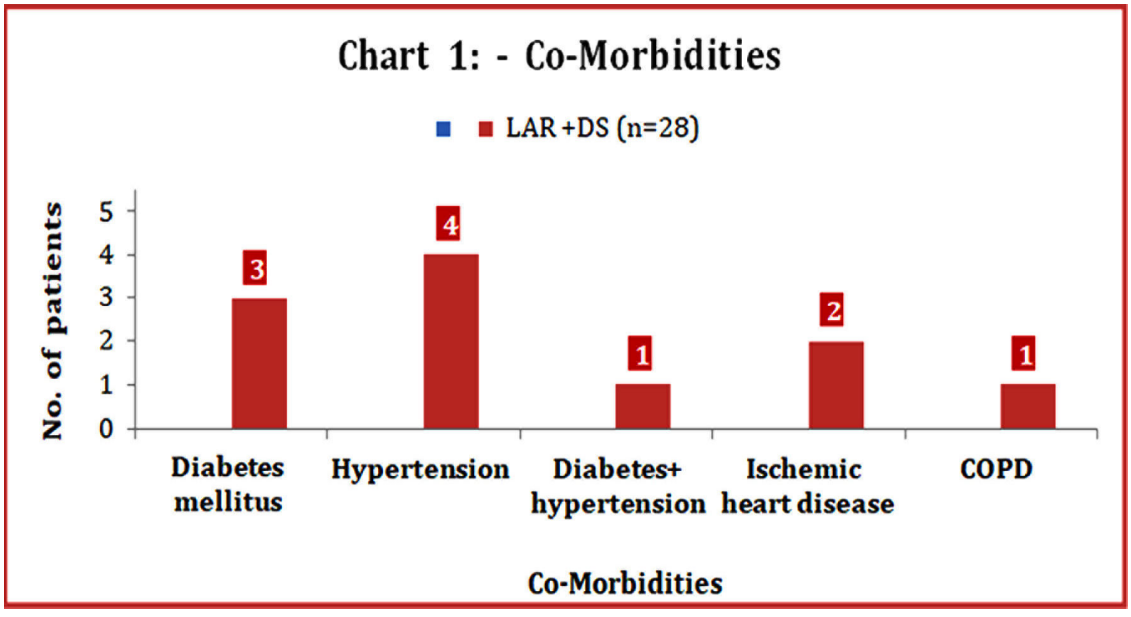
Study was carried out in the Department of Surgery, S.P. Medical College and P.B.M Hospital, Bikaner. This is a prospective descriptive study and was carried out between December 2021 to November 2022.

Inclusion Criteria

1. All operable rectal cancer eligible for low anterior resection.
2. Age =/ > 18 years irrespective of gender

Exclusion Criteria

1. Patients not willing to participate in study.
2. Patients planned for Abdomino - perineal resection (APR).
3. Patients planned for low anterior resection



but ended up having Abdomino-perineal resection (APR).

4. Patients not willing for diversion stoma.
5. Patients with psychiatric condition.

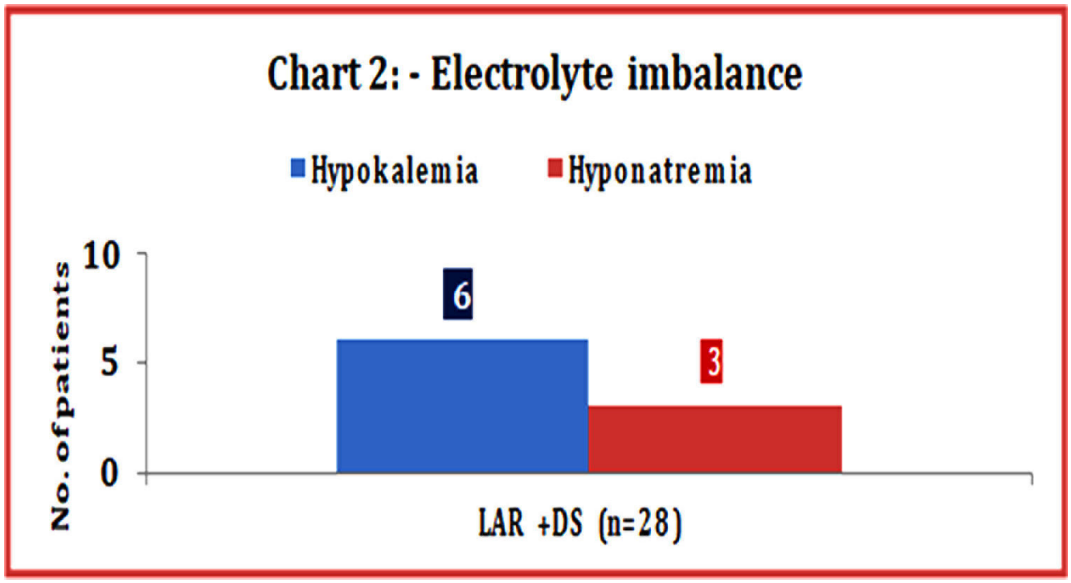
Total 28 consecutive rectal cancer were included who were eligible according to inclusion and exclusion criteria.

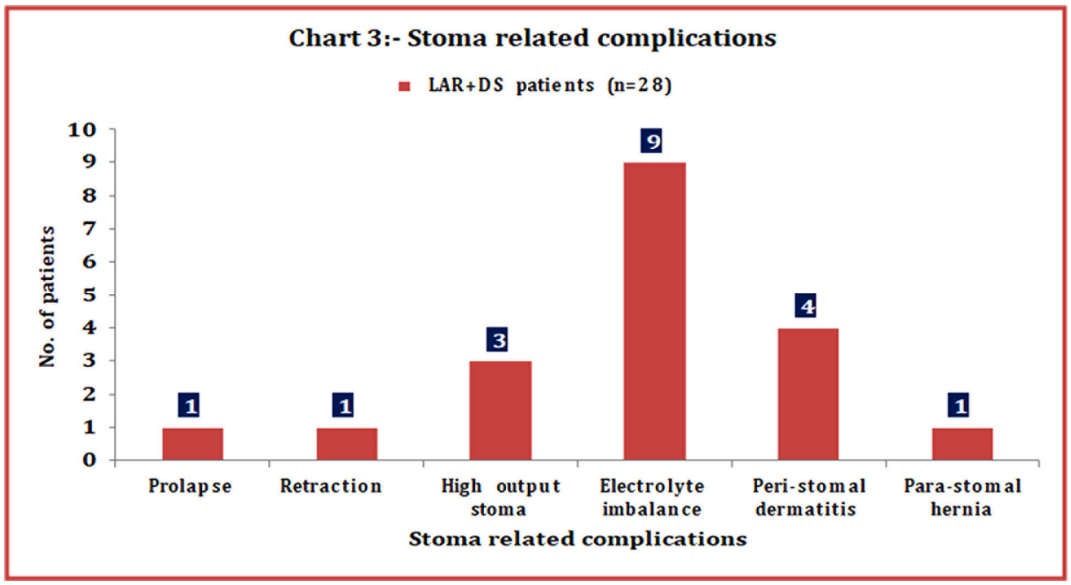
Data was collected from clinical examination and laboratory reports, radiological investigation, intra-operative finding and post-operative follow up findings.

Data were collected operative findings, course in hospital and complications including morbidity and mortality.

OBSERVATIONS AND RESULTS

Out of total 28 patients of LAR+DS there were total 18 males (64.29%) and 8 (35.71%) were females. Male to female ratio was 1.8:1. Mean age was 57.92±15.85 years. Mean BMI was 23.23±3.14.





3 (10.71%) had diabetes mellitus, 4 (14.28%) patients had hypertension, 1 (3.57%) patient had both diabetes mellitus and hypertension, 2 (7.14%) patients had ischemic heart disease and 1 (3.57%) patient had COPD. (Chart 1)

9 (32.14%) had stage 1, 13 (46.42%) patients had Stage 2 and 6 (21.42%) patient had stage 3 malignancy. There were no stage 4 patients.

6 (21.43%) patients received NACT and rest 22 patients (78.57%) had upfront surgical intervention

Out of total 28 patients 25 (85.71%) patients

Table 1: Characteristic of patients underwent Stoma closure (Second surgery)

S r. no.	Outcome	No. of patients (n=25)	Mean
1	Minimum time to stoma closure (weeks)	12	16.04 (±4.53)
2	Maximum time to stoma closure (weeks)	30	
3	Minimum Hospital duration stoma closure surgery (days)	05	5.84 (±1.57)
4	Maximum Hospital duration stoma closure surgery (days)	12	

had well differentiated malignancy and 3 patients (14.29%) had poorly differentiated malignancy on final histopathology report.

Post-operatively 1 (3.57%) patient had anastomotic leak, 3 (10.71%) had wound infection, 6 patients (21.42%) had chest infection, 1 (3.57%) patients pelvic collection, 9 (32.15%) patients had electrolyte imbalance, 2 (7.14%) patients had ileus.

The most common stoma related complication was electrolyte imbalance which was present in 9(32.15%) patients. Peristomal dermatitis was present in 4 (14.28%) patients. 3 (10.71%) patients had high stoma output. Stoma prolapse, retraction and peristomal hernia were present in 1 (3.57%) each. (Chart 2, 3)

Table 2: Comparison of anastomotic leak with various other studies.

Sr. No.	Studies	Anastomotic leak present (%)
		LAR+DS
1.	Present study (n=28)	3.57%
2.	Niu et al 2020[8]	6.31%
3.	Liming wang et al 2019[9]	10.18%
4.	Peter Ihnát et al 2016[10]	2.5%
5.	Mrak et al 2016[11]	6.4%
6.	M thoker et al (n=78)[12]	5.88%
7.	Seo SI et al 2013[13]	0.4%
8.	Karahasanoglu T et al 2011[14]	0%
9.	Shiomi A et al 2010[15]	0.7%

Table 3: Comparison of anastomotic leak with various other studies

Sr. no.	Studies	Wound infection present (%)
		LAR+DS
1.	Present study (n=28)	10.71%
2.	Liming wang et al 2019[9]	2.4%
3.	Mrak et al 2016[11]	7.44%
4.	M thoker et al 2016[15]	18.8%
5.	Karahasanoglu T et al 2011[14]	9%

Mean hospital duration during primary surgery of patients was 11.46±2.47.

Post stoma closure hospital stay was minimum 5 days and maximum 12 days Mean Post stoma closure hospital stay was 5.84 (±1.57) days.

Out of total 28 patients 1 (3.57%) patient died, 25 (89.29%) patients underwent subsequent stoma closure. Rest 2 (7.14%) patients had their ileostomy as a permanent stoma.

25 patients underwent stoma closure. Minimum time to stoma closure was 12 weeks and maximum time was 30 weeks. Mean time to stoma closure in our patients was 16.04 (±4.53) weeks.

Table 4: Comparison of time of stoma related complications with other studies.

Sr. No.	Stoma related complication	Present study LAR+DS (n=28)	Peter Ihnát et al 2016[10]	M thoker et al[12]
1.	Prolapse	3.57%	-	5.9%
2.	Retraction	3.57%	1.28%	2.9%
3.	High output stoma	10.71%	10.25%	-
4.	Electrolyte imbalance	32.15%	-	11.83%
5.	Peri-stomal dermatitis	14.28%	19.23%	14.7%
6.	Para-stomal hernia	3.57%	2.56%	-

Table 5: Comparison of stoma closure rate with other studies.

Sr. no.	Studies	No. of patients with stoma	No. of patients with closure done	Stoma closure Percentage %
1.	Present study (n=28)	28	25	89.28%
2.	Niu et al 2020 [8]	78	74	94.8%
3.	M thoker et al [12]	34	31	91.17%

Table 6: Comparison of time of stoma closure and hospital stay (Second surgery)

Sr. no.	Outcome	Present study (n=25)	M thoker et al [12] (n=31)
1.	Minimum time to stoma closure (weeks)	12	12
2.	Maximum time to stoma closure (weeks)	30	30
3.	Mean time to stoma closure (weeks)	16.04 (±4.53)	16.8 (±4. 30)
4.	Minimum Hospital duration stoma closure surgery (days)	5	3
5.	Maximum Hospital duration stoma closure surgery (days)	12	6
6.	Mean Hospital duration stoma closure surgery (days)	5.84 (±1.57)	3.6 (±0.9)

DISCUSSION

We compared our study results with various previous studies. In our present study out of total 28 patients 1(3.57%) patient died, 25 (89.29%) patients underwent subsequent stoma closure. Rest 2 (7.14%) patients had their ileo-stoma as a permanent stoma. This confirms our study with Niu et al 2020[8] and M thoker et al.[12] with 94.8% and 91.17% rate of stoma closure.

Diversion stoma subjects patients to additional procedure which has its own risks and complications. It also increases additional cost of treatment and health care expenditure.

In our present study mean time to stoma closure was 16.04 (±4.53) weeks which is comparable with Study conducted by M thoker et al[12] where mean time to stoma closure was 16.80 (±4.30) weeks. Time taken from stoma creation to stoma closure affects the patient's quality of life significantly. Most patients; specially malignancy patients who are already debilitated are unable to go out or go to their work during this period due to social stigma, lack of awareness about proper stoma care.

Mean hospital duration after stoma closure surgery in our study was 5.84 (±1.57) days which is not comparable with Study conducted by M thoker et al[125] where mean hospital duration after stoma closure surgery was 3.6 days. Possible reason is that the hospital surgical hospital duration is highly dependent upon institutional criteria like time from surgery to starting oral intake, time from surgery to mobility and uses of pelvic drain.

CONCLUSION

Diversion stoma comes at a cost in terms of stoma related complications (dermatitis, para stomal hernia, stoma retraction, stoma prolapse and electrolyte in balance) which leads to increased hospital duration stay and prolonged time to get back to work, social stigma and affects quality of life of patients.

Stoma creation also subjects the patient to the risks associated with stoma closure surgery. The rate of complications associated with the diverting stoma was non-negligible, so strict criteria should be applied when deciding whether to use a diverting stoma.

Decision to create or not to create diversion stoma should be individualized on case to case basis upon operating surgeon's discretion with shared information to patient and his/her family with their active involvement in decision making.

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