

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

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family with their involvement in decision making.

Keywords: Rectal cancer; Diversion stoma; LAR.

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.

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 dehiscence.^{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

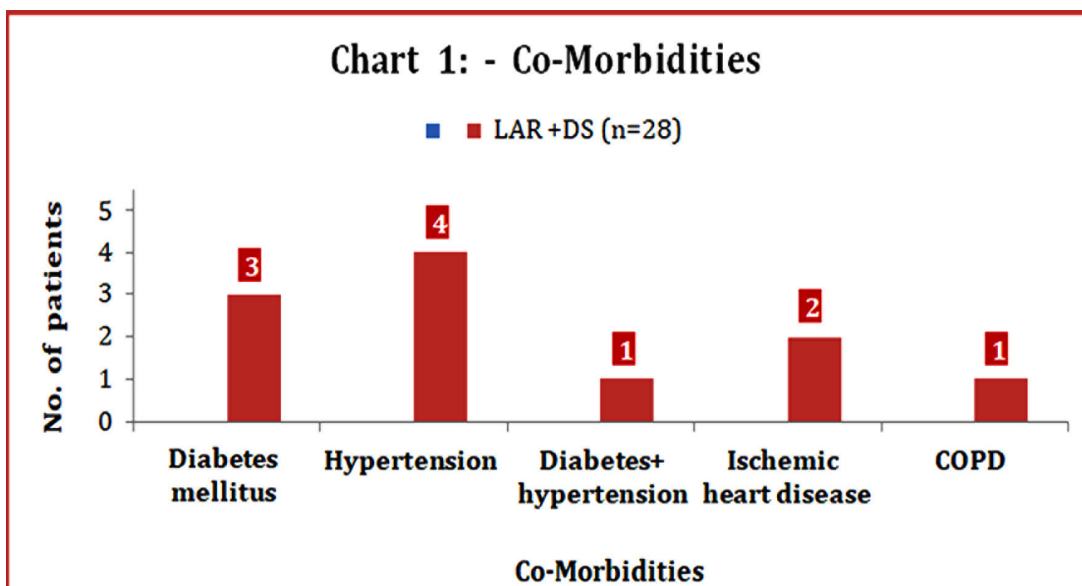
Study was carried out in the Department of Surgery, S.P. Medical College and P.B.M Hospital, Bikaner. This is a prospective descriptive study and was carried out between December 2021 to November 2022.

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.

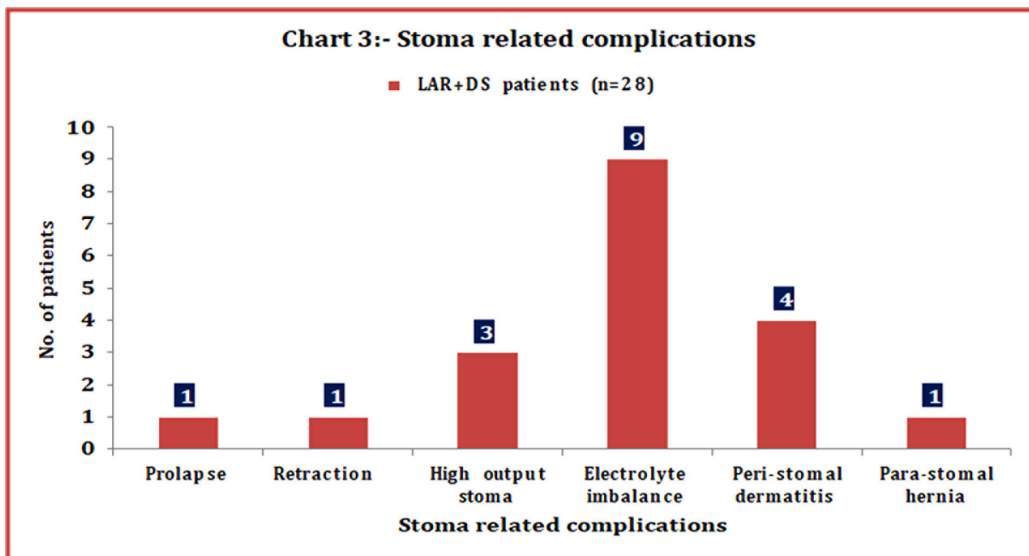
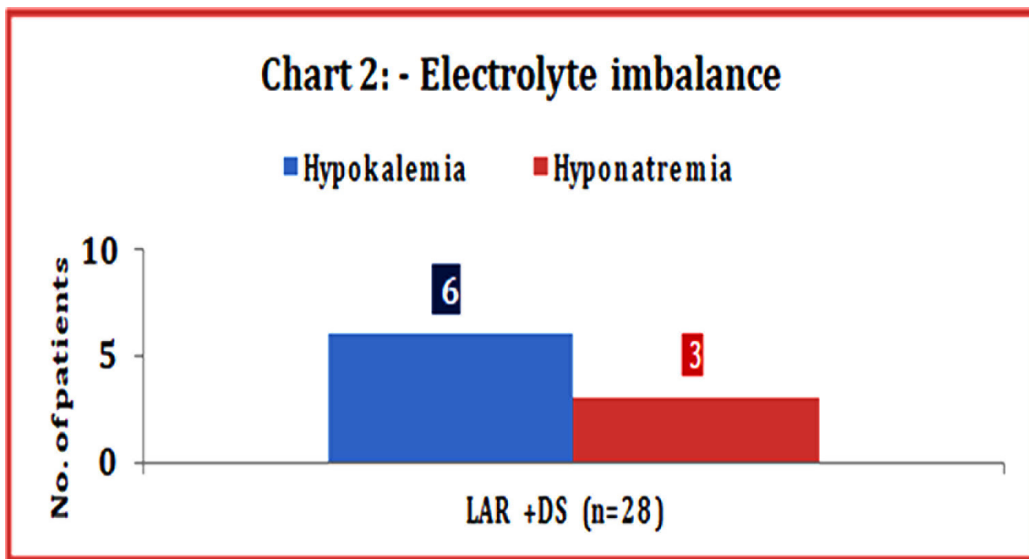
Data was collected from clinical examination and laboratory reports, radiological investigation, intra-operative finding and post-operative follow

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
2	Maximum time to stoma closure (weeks)	30	(±4.53)
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

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%

had high stoma output. Stoma prolapse, retraction and peristomal hernia were present in 1 (3.57%) each. (Chart 2, 3)

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 2020⁸ 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 al¹² 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 al¹² 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.

REFERENCES

1. Van de Velde CJ, Boelens PG, Borras JM, Coebergh JW, Cervantes A, Blomqvist L, Beets-Tan RG, van den Broek CB, Brown G, Van Cutsem E, Espin E. EURECCA colorectal: multi disciplinary management: European consensus conference colon & rectum. *European journal of cancer*. 2014 Jan 1;50(1):1-e1.
2. Hyman N, Manchester TL, Osler T, Burns B, Cataldo PA. Anastomotic leaks after intestinal anastomosis: it's later than you think. *Annals of surgery*. 2007 Feb;245 (2) : 254.
3. Tsunoda A, Tsunoda Y, Narita K, Watanabe M, Nakao K, Kusano M. Quality of life after low anterior resection and temporary loop ileostomy. *Diseases of the colon & rectum*. 2008 Feb; 51(2): 218-22.
4. Tuson JR, Everett WG. A retrospective study of colostomies, leaks and strictures after colorectal anastomosis. *International journal of colorectal disease*. 1990 Mar;5(1):44-8.
5. Pędziwiatr M, Pisarska M, Kisielewski M, Major P, Mydlowska A, Rubinkiewicz M, Winiarski M, Budzyński A. ERAS protocol in laparoscopic surgery for colonic versus rectal carcinoma: are there differences in short-term outcomes?. *Medical Oncology*. 2016 Jun;33(6):1-9.
6. Mäkelä JT, Kiviniemi H, Laitinen S. Risk factors for anastomotic leakage after left-sided colorectal resection with rectal anastomosis. *Diseases of the colon & rectum*. 2003 May;46(5):653-60.
7. Pokorny H, Herkner H, Jakesz R, Herbst F. Predictors for complications after loop stoma closure in patients with rectal cancer. *World journal of surgery*. 2006 Aug;30(8):1488-93.
8. Niu L, Wang J, Zhang P, Zhao X. Protective ileostomy does not prevent anastomotic leakage after anterior resection of rectal cancer. *J Int Med Res*. 2020 Aug;48(8):300060520946520. doi: 10.1177/0300060520946520. PMID: 32862745; PMCID: PMC7457655.
9. Wang L, Hirano Y, Ishii T, Kondo H, Hara K, Obara N, Tan P, Yamaguchi S. Diverting Stoma Versus No Diversion in Laparoscopic Low Anterior Resection: A Single-center Retrospective Study in Japan. *In Vivo*. 2019 Nov-Dec;33(6):2125-2131. doi: 10.21873/invivo.11713. PMID: 31662547; PMCID: PMC6899151.
10. Ihnát P, Vávra P, Guňková P, Zatloukal A, Czudek S, Zonča P. Laparoskopická protektivní ileostomie v chirurgii karcinomu rekta [Laparoscopic diverting ileostomy in rectal cancer surgery]. *Rozhl Chir*. 2017 Spring; 96 (3):120-124. Czech. PMID: 28433044.
11. Mrak K, Uranitsch S, Pedross F, Heuberger A, Klingler A, Jagoditsch M, Weihs D, Eberl T, Tschmelitsch J. Diverting ileostomy versus no diversion after low anterior resection for rectal cancer: A prospective, randomized, multicenter trial. *Surgery*. 2016 Apr;159 (4):1129-39. doi: 10.1016/j.surg.2015.11.006. Epub 2015 Dec 17. PMID: 26706610.
12. Thoker M, Wani I, Parray FQ, Khan N, Mir SA, Thoker P. Role of diversion ileostomy in low rectal cancer: a randomized controlled trial. *Int J Surg*. 2014;12(9):945-51. doi: 10.1016/j.ijssu.2014.07.012. Epub 2014 16. PMID: 25038542.
13. Seo SI, Yu CS, Kim GS, Lee JL, Yoon YS, Kim CW, Lim SB, Kim JC. The Role of Diverting Stoma After an Ultra-low Anterior Resection for Rectal Cancer. *Ann Coloproctol*. 2013 Apr;29(2):66-71. doi: 10.3393/ac.2013.29.2.66. Epub 2013 Apr 30. PMID: 23700573; PMCID: PMC3659245.
14. Karahasanoglu T, Hamzaoglu I, Baca B, Aytac E, Erenler I, Erdamar S. Evaluation of diverting ileostomy in laparoscopic low anterior resection for rectal cancer. *Asian J Surg*. 2011 Apr;34(2):63-8. doi: 10.1016/S1015-9584(11)60021-3. PMID: 21723468.
15. Shiomi, A., Ito, M., Saito, N. et al. Diverting stoma in rectal cancer surgery. A retrospective study of 329 patients from Japanese cancer centers. *Int J Colorectal Dis* 26, 79–87 (2011).

