How to Cite:
Farooque, M., Bhatt, L., & Desai, Z. (2022). Midline stoma via the umbilicus versus traditional diverting loop ileostomy: A retrospective comparative study. *International Journal of Health Sciences*, *6*(S5), 8765–8770. https://doi.org/10.53730/ijhs.v6nS5.10687

Midline stoma via the umbilicus versus traditional diverting loop ileostomy: A retrospective comparative study

Dr. Mohammad Farooque*
Assistant Professor, Department of General Surgery, Sumandeep Vidyapeeth, Piparia
*Corresponding author

Dr. Lauve Bhatt
Assistant Professor, Department of General Surgery, Sumandeep Vidyapeeth, Piparia

Dr. Zeel Desai
Post Intern, Sumandeep Vidyapeeth, Piparia

***Abstract*---**Diverting loop ileostomies have traditionally been fashioned in the right iliac fossa, but a novel technique of midline loop ileostomy at the umbilical port site during colorectal surgeries have been described. We aim to compare outcomes after creation and reversal of these two types of ileostomy. Using a retrospective study design, 10 consecutive patients who underwent a midline loop ileostomy were compared with 10 consecutive patients who underwent a traditional right iliac fossa stoma. Baseline characteristics, operating time, length of stay and complications for the initial operation as well as reversal of stoma operation were compared between the two groups. There was no significant difference in duration of operation or complication rate after the initial stoma formation, but length of hospital stay was longer in the traditional stoma group (10 vs 4.5 days, p = 0.04). After reversal of ileostomy, the traditional stoma group had a significantly higher perioperative complication rate compared to the midline stoma group (50 vs 0%, p = 0.03), but there was no difference in operation time or length of hospital stay. Midline diverting loop ileostomy is a safe technique with regard to formation, management and reversal when compared to a traditional right iliac fossa loop ileostomy.

***Keywords*---**Umbilical stoma, Ileostomy, Laparoscopic colorectal surgery, Diverting stoma, Faecal diversion.

Introduction

Temporary diverting loop ileostomy is a common technique utilised selectively for high-risk colorectal and colo-anal anastomoses, to reduce the perioperative morbidity from anastomotic leak [1, 2]. However, all stomas carry an inherent risk of complications, as well as reduced quality of life [3]. Diverting loop ileostomies have traditionally been fashioned through a right iliac fossa incision. Midline stomas placed at the umbilicus have been described in the paediatric population [4]. Many reports have shown this procedure to be safe [5]. There have also been two case series of patients undergoing midline colorectal 'umbilical' stomas [6, 7]. Objective comparison between the two types of stomas is lacking. This study aims to compare patients with temporary midline ileostomies and those with traditional stomas.

Methods

Design

This study included all patients requiring a temporary loop ileostomy by a single surgeon at Dhiraj Hospital, Sumandeep Vidyapeeth, Pipariya between March 2021 and December 2021. The indication for surgery in all patients was either colorectal cancer, inflammatory bowel or diverticular disease. Ten consecutive patients who underwent a midline loop ileostomy were compared with 10 consecutive patients who underwent a traditional right iliac fossa stoma. Baseline characteristics, operating time, length of stay and complications for the initial operation as well as reversal of stoma operation were compared between the two groups. Demographic and operative details were retrieved from patient records.

Statistical analysis

Statistical analysis using SPSS Version 22 (SPSS Inc., Chicago IL, USA) was used to assess the significance of differences between the groups. Fisher's exact test and the MannWhitney U test were used for categorical and continuous variables, respectively.

Surgical technique

All midline stomas were fashioned through the umbilical laparoscopic port site, which was created by extending the port site incision just inferior to the umbilicus. Traditional right iliac fossa stomas were fashioned through the rectus abdominus muscle. In both groups, the fascial defect was widened to accommodate two fingers and appropriate spouting of at least 2 cm for the proximal limb was achieved. No antiadhesion barriers were used around the stoma site . Reversal of stomas in both groups was performed in a similar fashion, utilising a peristomal incision and sharp dissection to mobilise the bowel from the fascia and peritoneum. The anastomosis was performed with a stapled functional end to-end anastomosis. The abdominal wall was closed with interrupted non-absorbable sutures. In the midline stoma group, the infra-umbilical skin was closed with interrupted subcuticular sutures and the umbilical part left open to drain. In the traditional stoma group, the skin was closed with a purse string subcuticular suture and the central portion of the wound left open to drain.

Table 1: Baseline Patient Characteristics

	Midline Stoma (n=10)	Traditional Stoma (n=10)	P value
Age(years)	55 (23-77)	69(36-80)	0.151
Gender ratio (M/F)	4/6	6/4	0.656
BMI (kg/m2)	27 (18-32)	25(19-45)	0.880
ASA (II / III)	8/2	5/5	0.350

Stoma Management

All patients in the study received a consultation from a dedicated stomal therapy nurse pre-operatively. Those with traditional right iliac fossa stomas received pre-operative stoma siting. Stoma nursing care was provided during their inpatient stay and in the early post-operative period at 1 and 2 weeks post discharge. Once patients were confident in managing their stoma, consultation with stoma nursing coincided with their colorectal outpatient appointments.

Results

Ten patients with reversal of midline stomas and 10 patients with reversal of traditional right iliac fossa stomas were identified. There were no significant differences in baseline characteristics between the two groups (Table 1). Clinical indication for the initial surgery for patients in both groups is shown in Table 2. The ulcerative colitis patients all eventually underwent completion proctectomy or proctocolectomy and ileal pouch anal anastomosis with a diverting loop ileostomy. Three of the patients in the midline stoma group had a previous midline end ileostomy as part of an initial subtotal colectomy. Comparison between the two groups with regard to outcomes for the initial surgery is shown in Table 3. All patients in the midline stoma group had laparoscopically assisted procedures, whilst 4 out of 12 procedures in the traditional group were laparoscopically assisted. There was no significant difference in operating time between the two groups ($p = 0.17$). The length of stay was significantly shorter in the midline stoma group ($p = 0.04$). The complications in the midline stoma cohort were the following: (1) stomal retraction and (2) presacral collection requiring percutaneous drainage. The complications in the traditional stoma group were the following: (1) wound sepsis and (2) post-operative bleed requiring readmission and endoscopy. Comparison between the two groups with regard to the reversal surgery is shown in Table 4. There was no significant difference in operating time or length of stay between the two groups ($p = 0.290$). There were no recorded complications in the midline stoma group, whereas there was a 50% complication rate in the traditional stoma group ($p = 0.033$). The complications included the following: (1) entero-cutaneous fistula, (2) post-operative ileus in two patients requiring extended length of stay, (3) small bowel obstruction, (4) incisional hernia and (5) ischaemic stroke.

Table 2: Indication for initial surgery

	Midline stoma(n=10)	Traditional Stoma(n=10)
Colorectal cancer	5	8
Ulcerative Colitis	4	1
Diverticular disease	1	1

Table 3: Initial surgery outcomes

	Midline stoma (n=10)	Traditional Stoma(n=10)	P value
Operative time (min)	310	262.5	0.174
Length of stay(days)	4.5	10	0.040
Complication (%)	2/10 (20%)	2/10 (20%)	1.000

Table 4: Reversal surgery outcomes

	Midline stoma(n=10)	Traditional stoma(n=10)	P value
Time to reversal(days)	172	187	0.290
Operation time(min)	74.5	87	0.290
Length of stay (days)	3	5	0.282
Complications	0/0 (0%)	5/10 (50%)	0.033

Discussion

Despite the potential benefits of a diverting loop ileostomy, creation of an ileostomy is associated with a complication rate as high as 43%, as well as impairment in quality of life [7, 8]. Furthermore, ileostomy reversal is associated with significant morbidity. A systematic review of ileostomy reversal demonstrated an overall morbidity of 17.3%, with complications including bowel obstruction in 7.2% and wound infection in 5% [9]. Prior to laparoscopic colorectal surgery, a midline stoma had been viewed as unfavourable due to the difficulties in spouting and management of a stoma placed at the centre of a long midline laparotomy wound [5]. However, a midline stoma through the umbilical laparoscopic port site poses multiple theoretical advantages. When the stoma is fashioned in the midline, a separate right iliac fossa incision, division of the rectus muscle and risk of inferior epigastric injury are avoided. From a functional perspective, stoma visualisation and care are potentially improved and patients could lie on both sides without discomfort. Upon reversal, adhesions to the rectus muscle are avoided and the cosmetic outcome is superior as symmetry is maintained and the wound is incorporated with the umbilicus . In this study, formation of a midline loop ileostomy did not result in increased morbidity when compared to a traditional right iliac fossa stoma. The midline stoma group had a significantly

shorter length of stay for their initial operation, but this is likely reflective of the presence of open colorectal procedures in the traditional stoma group rather than the type of stoma used. The only significant stoma-related complication in the midline stoma group was retraction and resultant skin excoriation in a single patient. This was addressed by refashioning of the stoma with increased length of proximal spouting and the patient's symptoms resolved. In this series, the bowel resection specimen at the index operation was extracted using a Pfannenstiel incision rather than the umbilical port site. However, in one case series, the specimen was routinely brought out from the umbilical fossa and despite requiring a larger incision, a midline stoma could still be successfully constructed [6]

Once in situ, the midline stoma was generally well tolerated, although this aspect was not comparable with the traditional group due to the retrospective study design. Most patients with a midline stoma initially had a minor degree of peristomal skin irritation secondary to leakage once the postoperative stoma oedema had subsided. This issue was successfully corrected in all cases by use of convexity stoma appliances that raised the skin surrounding the stoma. Peristomal skin problems are encountered in up to 68% of patients with traditional stomas and can range from hyperaemic areas to ulcerative lesions and necrosis [10]. In this series of midline stomas, there were no cases of ulcerative lesions or necrosis. In our experience, the critical factors in ensuring success of a midline stoma include adequate spouting, early post-operative review and the assistance of an experienced stomal therapist. In this study group, there was no significant difference in operation time or length of stay between groups for their stoma reversal. The median operation time was shorter in the midline stoma group, but did not reach statistical significance. A significant determinant of operation time is the amount of adhesions at the stoma site, which is difficult to quantify. There is evidence that reversal of loop ileostomy following laparoscopic surgery is associated with shorter operating time, reduced length of stay and lower complication rate compared to open surgery [11, 12]. However, this was not borne out when we compared these variables in our traditional stoma cohort. There was a higher rate of overall complications encountered upon reversal of traditional stomas when compared to midline stomas. However, due to small sample size, meaningful comparisons between the two groups could not be determined. Certainly, in this study, midline stomas appear safe to reverse with a complication rate lower than described in the literature. Significantly, there were no post-reversal wound complications in the midline stoma group, despite the position of the stoma adjacent to the umbilicus. We believe this is partly accounted for by the method of closure where only the infra-umbilical skin is closed and the umbilicus is left open to drain.

Conclusion

In conclusion, the midline diverting loop ileostomy is a feasible option when performing laparoscopic colorectal surgery. When compared with traditional right iliac fossa ileostomies, this study has shown non-inferiority with respect to operation time, length of stay and complications both on stoma formation and reversal. Future directions include randomised studies involving a larger number of cases with emphasis on objective quality of life outcomes and validated stoma

assessment tools to determine whether the theoretical benefits from a functional and cosmetic perspective are realised [13, 14].

References

1. Beitz J et al (2010) Content validation of a standardized algorithm for ostomy care. Ostomy Wound Manage 56(10):22–38
2. Chow A, Tilney HS, Paraskeva P, Jeyarajah S, Zacharakis E, Purkayastha S (2009 Jun 1) The morbidity surrounding reversal of defunctioning ileostomies: a systematic review of 48 studies including 6,107 cases. Int J Color Dis 24(6):711
3. Eto K et al (2013) Transumbilical defunctioning ileostomy: a new approach for patients at risks of anastomotic leakage after laparoscopic low anterior resection. Anticancer Res 33(11):5011–5015
4. Fitzgerald PG, Lau GY, Cameron GS (1989) Use of the umbilical site for temporary ostomy: review of 47 cases. J Pediatr Surg 24(10):973
5. Gessler B, Haglind E, Angenete E (2012) Loop ileostomies in colorectal cancer patients–morbidity and risk factors for nonreversal. J Surg Res 178(2):708–714
6. Hiranyakas A et al (2013) Loop ileostomy closure after laparoscopic versus open surgery: is there a difference? Surg Endosc 27(1):90– 94
7. Kaidar-Person O, Person B, Wexner SD (2005) Complications of construction and closure of temporary loop ileostomy. J Am Coll Surg 201(5):759–773
8. Karanjia ND et al (1994) Leakage from stapled low anastomosis after total mesorectal excision for carcinoma of the rectum. Br J Surg 81(8):1224–1226
9. Matthiessen P et al (2007) Defunctioning stoma reduces symptomatic anastomotic leakage after low anterior resection of the rectum for cancer: a randomized multicenter trial. Ann Surg 246(2):207– 214
10. Mushaya CD et al (2015) Temporary diverting ileostomy via the umbilicus: a small case series. Int Surg 100:436–443
11. Redmond C, Cowin C, Parker T (2009) The experience of faecal leakage among ileostomists. Br J Nurs 18(17):S12–S17
12. Seow-En I, Daud MA, Seow-Choen F (2011) The umbilicus as a site for defunctioning ileostomies. Tech Coloproctol 15(2):213–214
13. Silva MA, Ratnayake G, Deen KI (2003) Quality of life of stoma patients: temporary ileostomy versus colostomy. World J Surg 27(4):421–424
14. Suryasa, I. W., Rodríguez-Gámez, M., & Koldoris, T. (2021). The COVID-19 pandemic. International Journal of Health Sciences, 5(2), vi-ix. https://doi.org/10.53730/ijhs.v5n2.2937
15. Tilyakov, H. A., Valiyev, E. Y., Tilyakov, A. B., & Tilyakov, A. B. (2021). A new approach to surgical treatment of victims with pelvic and femoral fracture injuries, taking into account the severity of the condition and the severity of the injury. International Journal of Health & Medical Sciences, 4(3), 338-346. https://doi.org/10.31295/ijhms.v4n3.1763
16. Williams J et al (2010) Evaluating skin care problems in people with stomas. Br J Nurs 19(17):S6–S15