International Surgery Journal
Ahmed AE et al. Int Surg J. 2018 Aug;5(8):2708-2711
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20183189

Original Research Article

Laparoscopic versus open restoration of the gut continuity after Hartmann's procedure

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Received: 18 May 2018
Accepted: 27 June 2018

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ABSTRACT

Background: In 1921, Hartmann, a French surgeon described his operation for the resection of left-sided colonic carcinoma. The technique described a sigmoid colectomy without anastomosis; a left lower quadrant end colostomy and the rectal stump closure was performed. The aim of this study was to compare the outcome of the laparoscopic and open restoration of the gut continuity after Hartmann operation as regard operative and post-operative complication.
Methods: All patients who underwent restoration of the gut continuity after Hartmann's procedure either laparoscopic Hartmann's closure or open Hartmann's reversal between December 2013 and December 2016 were included.
Results: Between December 2013 and December 2016, 32 patients underwent restoration of the gut continuity after Hartmann's procedure in Sohag university hospitals, Egypt, were enrolled in this study.14 patients had a laparoscopic reversal of Hartmann's colostomy and 18 had an open reversal of Hartmann's colostomy. There was no significant difference between both groups as regard age, sex, body mass index, length of remaining rectal stump or time interval between primary operation and Hartmann reversal. The most common indication for Hartmann's colostomy was obstructed recto sigmoid cancer (13/32). The operative time was significantly shorter in LHR group (107 minutes versus 124 minutes p=0.031), time to pass flatus was significantly earlier in LHR (1.70 days versus 3.33 days p=0.000) , wound complications were significantly lower in LHR (1 case versus 8 cases p= 0.044), LHR had less post-operative pain 24 hours after procedure (VAS was 5.93 versus 8.72 p= 0.000).The length of hospital stay was significantly shorter in the LHR group (6.55 days versus 12.14 days P = 0.038), no significant difference between both group as regard intraoperative complications, leakage, reoperation or postoperative complications. Moreover, no mortality was detected in this study.
Conclusions: Laparoscopic reversal of Hartmann's operation is safe as open surgery, and had less postoperative pain, wound infection and shorter hospital stay. It should be the procedure of choice for reversal of Hartmann's operation.

Keywords: Colorectal surgery, Colostomy, Hartmann's procedure, Hartmann's colostomy, Laparoscopic reversal

INTRODUCTION

In 1921, Hartmann, a French surgeon described his operation for the resection of left-sided colonic carcinoma. The technique described a sigmoid colectomy without anastomosis; a left lower quadrant end colostomy and the rectal stump closure was performed.[1] The aim of Hartmann operation was to decrease the morbidity and mortality related to anastomotic leakage after primary left side intestinal anastomosis.[2] Nowadays the operation performed for other left colon pathologies, especially in the emergency situation, when perioperative conditions contraindicate the performance of a colorectal anastomosis.[3]

Open restoration of the gut continuity after Hartmann operation is a high-risk procedure. The rate of restoration of intestinal continuity after Hartmann procedure remains low at less than 50%.[2] It has a serious risk of surgical morbidity (up to 30% of cases), including a high rate of anastomotic leakage (up to 16%), and a considerable mortality risk (range: 4% to 10%).[4]

Anderson et al published the first report of a laparoscopically assisted Hartmann's reversal in 1993.[5]

The aim of this study was to compare the outcome of the laparoscopic and open restoration of the gut continuity after Hartmann operation as regard operative and post-operative complication.

METHODS

After the approval of the Institutional Review Board of the Sohag faculty of Medicine.

Surgical techniques

Mechanical and chemical bowel preparation was done for all patients approximately 24 hours before surgery. All patients received a single dose of perioperative broad-spectrum parenteral antibiotics and subcutaneous low-molecular-weight heparin. A nasogastric tube and urinary catheter were routinely inserted.

Figure 1: Position of the first trocar.

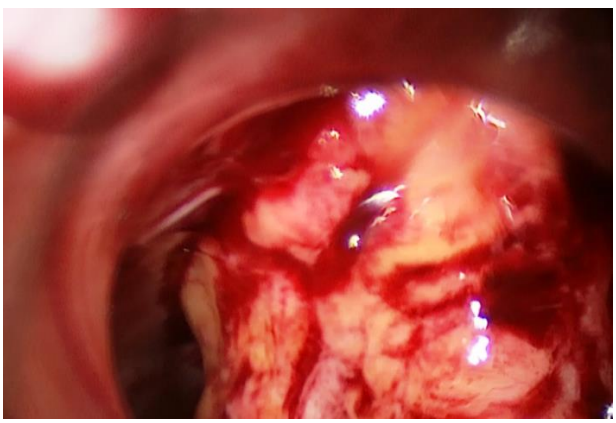

Figure 2: The colostomy as seen from inside.

Figure 3: Proximal and distal stump was ready for approximation with the anvil inside.

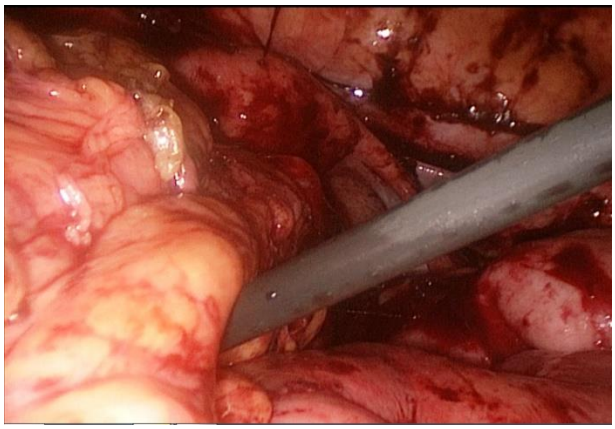

Figure 4 The anastomosis is completed by stapler.

All operations were performed under general anesthesia, patients were placed in either split-legged or modified lithotomy position the OHR was performed through an abdominal midline vertical incision. Adhesiolysis and dissection of the rectal stump were done by monopolar and/or bipolar electro surgery devices. Colorectal anastomosis was performed mechanically using the stapling device.

In the laparoscopic Hartmann's reversal group, the patients were placed in a modified lithotomy position with the lower limbs slightly flexed on stirrups. The surgeon and assistant standing on the right side of the patients, Video monitors were placed on the left side. Initial port insertion was accomplished by the open Hasson technique in the right lateral abdomen. A 3 to 5 trocars technique was used, depending on the level of operative difficulty encountered. Adhesiolysis was done using scissors, monopolar diathermy, or ultrasonically activated devices to release the colostomy and help identification of the rectal stump. A dilator, stapling device or sigmoidoscope was inserted into the rectum when necessary to identify the rectal stump. Mobilizations of the left colon, splenic flexure, were done. After freeing the colostomy from the anterior abdominal wall, the anvil of a circular stapling device was inserted into the lumen, A Transanal, end-to-end

anastomosis was performed using a circular stapling device.

Outcome measures

Operation time, estimated blood loss, time to flatus, time to resumption of diet, hospital stay, wound complications and other post-operative complication rates.

Statistical analysis

SPSS (IBM, SPSS) Statistics, Version 16 was used for Statistical analysis. The groups were compared using the Chi-squared or Fisher's Exact Test for the categorical variables and the T-test for the continuous variables. A p value <0.05 was considered significant.

RESULTS

Between December 2013 and December 2016, 32 patients were included in this study; 14 patients had LHR and 18 had OHR. Table 1 illustrates patient demographic data. There were no significant differences between both group as regard age sex and body mass index.

Table 1: Illustration of patient demographic data.

	LHR	OHR	P value
Total number	14	18	
Mean age	41.93	3.38	0.419
Sex			
Male	10	11	0.712
Female	4	7	
Body mass index			
Normal	12	15	0.919
Over-weight	1	2	
Obese	1	1	
Super-obese	0	0	
Time between primary operation and colostomy reversal	100.57 days	98.83 days	0.680
Length of rectal stump	9 cm	8.72cm	0.627

Table 2: Indication of Hartmann's operation

Indications					
The procedure	**Obstructed rectosigm. cancer**	**Sigmoid volvulus**	**Perf. Sigmoid divert.**	**Anorectal trauma**	**Total**
Procedures					
LHR	4	6	1	3	14
OHR	9	4	3	2	18
Total	13	10	4	5	32

Table 3: operative and postoperative outcomes.

	LHR	OHR	P value
Operative time	106.78 minutes	123.61 minutes	0.031
Inta-operative bowel injury	1	2	1
Time to pass flatus	1.70 days	3.33 days	0.000
Post-operative complications	2	6	0.412
leakage	0	2	0.492
Re-operation	0	2	0.492
Hospital stay	6.55 days	12.14 days	0.038
Wound	1	8	0.044
wound infection	1	7	
burst abdomen	0	1	
VAS 24	5.93	8.72	0.000

The time interval between primary operation and Hartman reversal for laparoscopic Hartmann's reversal and for open Hartmann's reversal was not significantly different between both groups.

The primary indication for Hartmann's colostomy operation was recorded and represented as seen in Table 2. The operative and post-operative outcomes are shown in Table 3.

The significant difference between both group were the operative time, hospital stay, time to pass flatus and 24 VAS pain score were significantly lower in laparoscopic Hartmann's reversal and wound related complication which was also significantly lower in LHR. Operative bowel injury occurred in one patient of LHR and in two patients of OHR (p=0.038). None of the patients of LHR had post-operative leakage, while two of the other group had leakage one of them respond to conservative treatment while the other need reoperation and refashioning of the anastomosis.

Two of the patient of OHR required reoperation one for leakage and the other for burst abdomen, while none of the patient of LHR re-operated. Two cases of LHR converted to open surgery due to difficult in rectal stump identification.

DISCUSSION

In this prospective comparative study, we present our experience with 32 patients that were divided to receive either LHR or OHR after primary Hartmann's procedure. We had no mortality in our series. Operative time, time to pass flatus, postoperative pain; wound infections and hospital stay were significantly shorter in LHR compared to OHR procedure. Up to our knowledge only few comparative studies between laparoscopic and open reversal of Hartmann's colostomy are present but there were no randomized studies compare the two procedures. In the literature few comparative studies were analyzed in a recent paper, the result showed that LHR was safe as open surgery and had a significant reduced complication rate; post-operative pain, wound infection and hospital stay.[6-8] Conversion of laparoscopic Hartmann's reversal was done in two cases (14.85%) due to failure of identification of rectal stump and extensive adhesion, this was comparable to other study which report conversion rate between 10-20%.[9,10]

No mortality was detected in this study in both groups, as it was detected by Rosen et al, in their published series that recorded no mortality.[11] The main study limitation was the small number of patient and it was non-randomized study.

CONCLUSION

Laparoscopic reversal of Hartmann's operation is safe as open surgery, and had less postoperative pain, wound infection and shorter hospital stay .it should be the procedure of choice for reversal of Hartmann's operation.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Ahmed AE, Ahmed WB, Redwan AA, Singh K. Laparoscopic versus open restoration of the gut continuity after Hartmann's procedure. Int Surg J 2018;5:2708-11.