HOSPITAL CHRONICLES 2022, 17(1): 12–15

ORIGINAL PAPER

Hartmann's Procedure for Left Side Large Bowel Emergencies

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ABSTRACT

BACKGROUND: Colonic emergency situations which need an intervention in emergency are quite common, especially in the left side of the abdomen. The aim of this study is to investigate the importance of Hartmann's procedure, which has been used for years in such cases.

METHOD: One hundred and fifty-six cases which underwent Hartmann's procedure due to a left side emergency, either malignant or benign, during over a 15-year period.

RESULTS: One hundred and fifty-six patients met the inclusion criteria in the final analysis. Fifty one point nine percent were operated due to malignancy, most of them at an advanced stage (65,4%). Half of them were treated for colonic perforation.

CONCLUSION: Left sided large bowel emergencies are mainly caused by complicated cancer and diverticulitis of the left colon. Hartmann's procedure remains a safe, simple and fast operation with an acceptable percentage of morbidity and mortality. Also, it continues to play a vital role in elderly and severely ill patients.

KEY WORDS: *large bowel, emergencies, Hartmann's procedure*

INTRODUCTION

Many diseases in the left colon, such as colonic perforation and/or obstruction, are associated with urgent abdominal conditions. The main causes are left colon cancer and diverticulitis. The treatment of these emergencies is accompanied by increased morbidity and mortality[1-4] and there is a disagreement among surgeons about which operation is most appropriate and effective.

Until 2006[5-7], Hartmann's procedure was the first-choice operation for left side emergency situations of the colon, as published by the Standards Committee of the American Society of Colon and Rectal Surgeons. Meanwhile, new alternatives have become popular in managing left side colon emergency situations, such as resection of the diseased or injured colon and primary anastomosis with or without protective ileostomy, emergency subtotal colectomy, intra-operative colonic lavage, use of transanal tube decompression and laparoscopic lavage and drainage of the abdomen[8-19]. Despite the positive outcomes presented by several researchers who used these techniques, Hartmann's procedure remains the most popular intervention in such situations[4,19-22].

We present our experience in the emergency treatment of the left colon with Hartmann's surgery, over the last 15 years in a District Hospital.

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Manuscript received December 19, 2021;
Revised manuscript received June 1, 2022;
Accepted June 2, 2022

MATERIALS AND METHODS

In the last 15 years (January 2004-December 2018), 156 patients with an emergency left-colon and sigmoid colon condition were treated with Hartmann's procedure (HP). During that time, a small number of other interventions were performed in selected patients, but the results could not be statistically comparable to those undergoing Hartmann's procedure. Specifically, 3 total colectomies were performed, in two cases with protective ileostomy, 2 three-stage operations (double-barrel colostomy, followed by resection of the damaged bowel and a colostomy closure) and one resection and primary anastomosis.

These 156 patients are analyzed in terms of sex, age, cause (perforation or obstruction), underlying disease, degree of peritoneal infection, stage of disease in cases of malignancy as well as comorbidities and hemodynamic stability during the surgery. We also studied the outcomes of the intervention (mortality, morbidity) in relation to these various factors. Descriptive statistical analysis was followed by chi-square tests to identify associations between categorical variables. All analysis were conducted with statistical package SPSS v.25.

RESULTS

Out of the 156 patients undergoing Hartmann's surgery, 81 were male and 75 were female. The patients' ages ranged from 27 to 97 years old (mean age of 68.72 years). The cause of the emergency was bowel perforation in 79 (50.6%) of the cases with generalized or localized peritonitis, while in 77 (49.4%) cases the cause of the emergency was the complete left side colonic or rectal obstruction (Table 1). In addition, the underlying disease was malignancy in 81 (51.9%) patients, perforation of diverticulum in 64 (41.0%) cases, while there were 11 (7.05%) even more rare causes (Table 2).

Out of a total of 156 surgeries, a 107 (68.6%) had a fecal intra-peritoneal infection. This involved all 79 (50.6%) intestinal perforation patients and 28 (17.9%) patients with left side colonic obstruction in which the distended colon circulated its fecal contents in the peritoneal cavity during surgical manipulations.

The AJCC classification of the 81 patients who had cancer, is shown in Table 3. Finally, 27 of the 156 (17.3%) patients had urgent surgery due to sepsis, hemodynamic instability and abnormal vital organ functions, especially those of the kidneys.

Regarding the postoperative results from Hartmann's procedure, 11 out of 156 patients died within the first 30 post-operative days (7.05% mortality). Postoperative complications are presented in Table 4 (42.3% overall morbidity). The most common complication was wound infection (34 patients). Three patients, who developed intra-pelvic abscess after Hartmann's procedure were successfully treated with CT guided percutaneous drainage and broad-spectrum antibiotics. In terms of colostomy-related complications, these involved

TABLE 1. Patient material

	SEX		AGE (distribution)	
	male	female	N age (in years)	mean
Colon rupture	48	31	79	64,31
Colon obstruction	33	44	77	73,75
	81	75	156	68,72

TABLE 2. Underlying disease of the patients with emergency of the left colon

	N	Percentage (%)
Malignancy	81	51.9
Diverticulitis	64	41.0
Iatrogenic rupture of the colon	2	1.3
Rupture of the rectum from foreign body	1	0.6
Enterocystic fistula	1	0.6
Ischemic colitis	1	0.6
Inflammatory colitis	2	1.3
Sigmoid volvulus	4	2.7

TABLE 3. AJCC patient's classification

	N	Percentage (%)
Stage II	28	34.6
IIA	23	28.4
IIB	4	4.9
IIC	1	1.3
Stage III	37	45.6
IIIB	33	40.7
IIIC	4	4.9
Stage IV	16	19.8
IVA	10	12.4
IVB	4	4.9
IVC	2	2.5

TABLE 4. Postoperative complications

	N	Percentage (%)
A. Stoma related complications	16	24.2
Stoma necrosis	6	9.1
Stoma stenosis	4	6.1
Stoma retraction	3	4.5
Parastomal hernia	3	4.5
B. Septic complications	37	56.1
Pelvic abscess	3	4.5
Wound infection	29	43.9
Wound disruption	5	7.7
C. Other complications	13	19.7
Cardiopulmonary	8	12.1
Urinary	3	4.5
Venous thromboembolism	2	3.1

16 (10.3%) patients, specifically 6 with colostomy necrosis, 4 with stenosis, 3 with stoma retraction and 3 with a delayed parastomal hernia.

Out of the 145 (92.95%) patients who survived, colostomy was restored in 52 (35.9%) of them. The rest of the patients were left with a permanent colostomy for various reasons (Table 5) with the main one being the patient's refusal to undergo new surgery.

DISCUSSION

Perforation and obstruction of the left colon are urgent situations requiring immediate restoration and account for 47% of all gastrointestinal emergency situations[23]. The first goal is to control sepsis and to resuscitate the patient with intravenous administration of fluids, antibiotics and appropriate cardiopulmonary support. This is followed by immediate surgical intervention to localize the lesion and remove the affected part of the colon.

TABLE 5. Causes of no stoma reversal

	N	Percentage (%)
Death	22	21.1
Patients' refusal	36	34.6
Metastatic disease or local recurrence	7	6.7
Co-morbidity	21	20.2
Lost to follow up	18	17.3

Most of these patients were elderly and to a large extent with an advanced stage of malignancy, many comorbidities, taking anticoagulants and often septic, with hemodynamic instability and abnormal renal function.

Surgical treatment for these situations is usually done on an emergency basis, which often forms non-ideal conditions, especially in small district hospitals, like ours. These patients are often operated on off-hours, without substantial help and by non-experienced and certainly not specialized colon surgeons. All these conditions and the fear of a potential serious complication such as the leak of anastomosis discourage most surgeons to perform bowel resection and primary anastomosis, rendering Hartmann's procedure a more popular option. Resection of the injured colorectal part, closure of the distal stump and formation of an end colostomy is indeed an operation easier to perform by less experienced surgeons.

The advanced age of the patient, comorbidities, the general condition of the patient, the degree of abdominal inflammation and the spread of fecal content, the surgeon's experience, the hospital's capabilities and the available surgical help are the factors that affect the decision on the type of surgery to be used[4,24-26].

Particularly in the case of complicated diverticulitis and more specifically for stages III and IV in Hinchey's classification[27], Hartmann's procedure remains the elective option[16,28]. For patients with left side colon cancer, the classification of AJCC cancer indicates that our cases were at an advanced stage, which was justified[29] because of complete bowel obstruction and/or rupture and this could only be caused when there was filtration of all the layers of the wall.

The mortality rate in our patients (7.05%), is in line with that of the international literature (5 to 12.5%)[30,31]. Regarding morbidity, wound inflammation was the most common complication (21.79%), while stoma related complications (described 7-30% in literature)[11,26,32,33], in our hospital were 10,25%. Hartmann's low reversal rates (33.33%) were consistent with international literature data (30-70%)[31,34-38] with the main reason being the patient's refusal for reconstructing surgery.

CONCLUSION

As a conclusion, we believe that Hartmann's surgery continues to play an important role, especially in the elderly and severely ill patients who undergo urgent operation for perforation or obstruction of the left colon because it is a simple and quick operation with acceptable morbidity and mortality rate and there is a possibility of reversal colostomy in ideal surgical conditions.

FUNDING

This research did not receive any specific grant from funding agencies in the public, commercial or not-profit sectors.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

Author Contributions according to the following criteria for authorship:

- Vasilcios Kalliakmanis: conception and design; critical revision of the article for important intellectual content; final approval of the article.
- Christos Bartsokas: critical revision of the article for important intellectual content, final approval of the article.
- Panagiota Koukoutsidi: conception and design; critical revision of the article for important intellectual content; final approval of the article.
- Sotirios Voulgaris: critical revision of the article for important intellectual content, final approval of the article.

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