International Journal of Scientific Reports
Teklewold B et al. Int J Sci Rep. 2021 Oct;7(10):484-488
http://www.sci-rep.com
pISSN 2454-2156 | eISSN 2454-2164
DOI: https://dx.doi.org/10.18203/issn.2454-2156.IntJSciRep20213696

Original Research Article

Retrospective analysis of factors associated with emergency colostomy: an institutional experience

Berhanetsehay Teklewold*, Ermias G. Meskel

Department of Surgery, Saint Paul Hospital Millennium Medical College, Addis Ababa, Ethiopia

Received: 01 August 2021
Revised: 05 September 2021
Accepted: 08 September 2021

***Correspondence:**
Dr. Berhanetsehay Teklewold,
E-mail: berhanetsehay.teklewold@sphmmc.edu.et

ABSTRACT

Background: Colostomy is one of the commonest lifesaving procedures done worldwide with an intention of either decompression of an obstructed colon or diversion of stool. This study tries to assess the pattern of emergency colostomy and factors associated with its complication in adult patients at St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia.
Methods: Retrospective reviews of charts were done of all adult patients who underwent colostomy procedure from December 1, 2016 to May 30, 2019.
Results: There were 149 adult patients that underwent colostomy procedure in the study period and the majorities were male (83.2%). Majority of the procedures were done for indication of LBO secondary gangrenous sigmoid volvulus (49%). The most common comorbidity identified were renal disease (5%) and diabetes mellitus (3%). All patients who presented with gangrenous sigmoid volvulus underwent end colostomy procedure and 16.8% of them died. Generally, 69 patients among 149 (46.3%) developed certain type of complication. Presence of complication was significantly associated with increased chance of death by eight times than those who had no complication after the procedure. End colostomy was significantly associated with development of complication when compared to loop colostomy. Among the study participants 87.9% of them were discharged improved. The main cause of death was multi organ failure secondary to septic shock, which accounted to 52.9% of all deaths.
Conclusions: Gangrenous sigmoid volvulus, colorectal cancer and trauma were leading indications for colostomy. Presence of complication and type of colostomy were factors significantly associated with outcome.

Keywords: Colostomy, Indication and complications, Ethiopia

INTRODUCTION

Colostomy is an artificial opening which is made for the passage of feces and flatus to the exterior, where it can be collected in an external appliance. It is most commonly performed for the purposes of decompression, drainage, diversion, exteriorization and protection of an anastomosis.[1-3] An emergency colostomy may be permanent or temporary, loop or end and sutured or suture less. The choice of the type of colostomy depends on the indication, the experience of the surgeon and the patient's general condition during surgery.[3]

In general, emergency surgical conditions make most of the reason for colostomy. The three most common reasons for colostomy construction were gangrenous sigmoid volvulus, left side colorectal cancers and trauma in that order. It was found that Gangrenous sigmoid volvulus was the most common indication necessitating colostomy.[2]

Factors affecting type and frequency of complications include surgical technique, surgeon experience, emergency creation, appropriate preoperative marking

and education, and patient issues such as age, obesity, diabetes and ability to care for stoma.[3]

Ever since it was first constructed successfully in 1710, colostomy has always been associated with significant complications at a rate of 21-70%. Complications include hernia, prolapse, retraction, necrosis, local sepsis, stenosis, bowel obstruction, and peristomal abscess. And the rates of these complications are higher in emergency operations.[4]

In spite of all the advances in the modern management of patients, colostomy still continues to be unavoidable emergency procedure in our setup. The colostomy made in emergency surgery is associated with multiple complications. Generally, the complication rates after stoma formation are considerable of 21-70%.[5]

Knowledge about disease burden for surgical emergencies is useful for both the surgical and public health communities in planning a more adequate response. Efforts to improve emergency colostomy creation should be based on reasonably accurate information about the causes of morbidity and mortality. Up to half of colostomies are "problematic," presenting management problems that require prolonged medical care and result in increased health care costs (prolonged length of stay and/or increased need for outpatient care). Postoperative management problems are exacerbated by poorly constructed or sited colostomies, complications following surgery, and inadequate perioperative care.[6] This study aims to assess the pattern and factors affecting complication of emergency colostomies in St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia. Knowing this will help us provide important information that is useful in the implementation of further interventions aimed at potential for quality improvement in pre- and post-operative management ensuring high-quality patient care.

METHODS

The study was conducted at the surgical department of St. Paul's Hospital Millennium Medical College; Addis Ababa Ethiopia. Retrospective medical record review was conducted of patient's chart between Decembers to May 2019.

All adult patients who underwent emergency colostomy procedure at SPHMMC surgical department during the study period were included in the study and patients less than 15 years of age and those with incomplete charts were excluded.

Structured record review check list developed and was used to collect the secondary data from the operation theater logbook and variables include socio demographic, clinical and other relevant information. The collected data was cleaned, edited, and entered to Statistical Package for Social Sciences (SPSS) version 23.0 statistical software. Data will be analyzed with SPSS version 23. Statistical test (chi square at 0.05 level of significance were used to assess the significance of association between variables). The analyzed data was presented using charts, tables, and graphs and described using texts. A p value <0.05 was considered statistically significant. Reference ranges for each measurement were calculated using 95% confidence interval. Compiled results were presented using text, tables, and graphs.

Ethical consideration

Ethical clearance for the study was obtained from Saint Paul Hospital Millennium Medical College institutional review board (ref no. 23/348). Permission was obtained from medical services directorate office to access medical records. The data was kept confidential and used only for research purpose. Informed consent was not taken from patients as this is retrospective review on charts and there are no information's identifying individuals.

RESULTS

Socio-demographic characteristics of participants

There were total of 160 adult patients who underwent emergency colostomy out of which 149 were included in the study and most of them were male (83.2%) with approximately 5:1 of male to female ratio. Mean age of the participants was 45.59 years (14.4).

Clinical characteristics and outcome of study participants

The most common indication for colostomy creation was gangrenous sigmoid volvulus (49%) and colorectal carcinoma (15.4%). The most performed procedure was end colostomy (66.4%) followed by loop colostomy (30.9%). majority of the study patients had no co-morbidities (78.52%). The most common comorbidity identified among those with co-morbidity was renal disease (5%) and diabetes mellitus (3%). All patients who presented with gangrenous sigmoid volvulus underwent end colostomy procedure among which 12 (16.8%) died.

Post-operative complications developed in 46.3% of patients and the most common complication was hospital-acquired pneumonia (10%) and superficial surgical site infection (8%). Common ostomy specific complications were colostomy retraction and prolapse that accounted only for 3.3% and 2% respectively (Table 1).

About 100 (67%) of patients had generalized peritonitis upon presentation and 54% of them developed some form of post-operative complication ($p<0.03$) and 16 (16%) of them died post operatively ($p<0.05$).

Complication rate was 54.08% in those with end colostomy and 34% with loop colostomy and no patients

developed complication from double barrel colostomy (p<0.08) (Table 2). About 80% of patients who developed certain complication were discharged improved and only 2.5% patient died among those without complication (p<0.001) (Table 3). Overall post-operative mortality was 10.7%.

Factors associated to outcome of emergency colostomy

Socio and clinical factors were cross tabulated with post-operative complication and outcome of patients using univariable analysis and only type of procedure and presence generalized peritonitis had statistical significance but when regressed none of them had statistically significantly related with post-operative complication as the outcome variable.

Considering final postoperative outcome, which is post-operative mortality, all variables were analyzed using univariable analysis and only presence of generalized peritonitis upon presentation, gangrenous sigmoid as preoperative indication and presence of post-operative complications were statistically significantly related with mortality. All variables which were statistically significant at univariable analysis were checked for multiple logistic regressions and only presence of post-operative complication had statistical significance. Those patients who had some form of post-operative complications had about 8 times higher risk of death than those who does not have complication (Table 4).

Table 1: Common complications observed post operatively among patients (n=149).

Post-operative complication	Frequency (%)	Total
No complication	80	53.7
HAP	15	10
SSI	12	6.1
Post op collection	9	2.6
Colostomy retraction	5	3.3
GI onset sepsis	5	2.0
DVT	4	2.6
Wound dehiscence	4	2.0
Hypokalemia	4	2.0
Colostomy necrosis	3	2
PTE	3	2.0
Colostomy prolapse	3	2.0
Partial SBO sec post op adhesion	1	0.6
Diarrhea	1	0.6

Table 2: Comparison of colostomy type by presence of post-operative complication (n=149).

Type of colostomy	Presence of complication		
	Yes	No	Total
	N (%)	N (%)	N (%)
End	53 (54.08)	45 (45.9)	98 (100)
Loop	16 (34)	31 (66)	47 (100)
Double barrel	0	4 (100)	4 (100)
	69 (46.3)	80 (53.7)	149 (100)

P<0.08.

Table 3: Comparison of patient's outcome with presence of post-operative complication during the study period.

Complication	Discharged	Dead	Total
	N (%)	N (%)	N (%)
Yes	55 (79.7)	14 (20.3)	69 (100)
No	78 (97.5)	2 (2.5)	80 (100)
	133	16	

P<0.001.

Table 4: Bivariable and multivariable analysis of patient outcome against clinical variables.

Variables		Outcome		Univariable analysis		Multivariable logistic regression	
		Discharged	dead	P value	COR (CI)	P value	AOR (CI)
Gender	Female	113	11	0.10	0.38 (0.12-1.24)	0.15	2.74 (0.67-11.13)
	Male	20	5	1	1		1
Type of procedure	End	85	14	0.13	0.2 (0.19-0.21)	0.99	0.00
	Loop	44	2	1	1	1	1
	Double barrel	4	0	0.25	0.0	0.76	0.0
Indication	Gangrenous sigmoid	61	12	0.03	3.49 (1.07-11.38)	0.30	2.49 (0.43-14.34)
	Others	71	4	1	1	1	1
Preoperative condition	Generalized peritonitis	84	16	0.01	2.84	0.99	0.0
	No peritoneal sign	43	0	1	1	1	1
Comorbidity	Yes	26	6	0.11	2.46 (0.82-7.41)	0.23	2.18 (0.61-7.81)
	No	107	10	1	1	1	1
Presence of complication	Yes	55	14	0.01	9.90 (2-45.44)	0.01	8.39 (1.70-41.22)
	No	78	2	1		1	

DISCUSSION

The hospital where this study was conducted receives patients from all parts of the country and fairly represents the nation's overall picture. Like other literatures, males and old age groups in the 4th and 5th decades were more commonly affected with conditions that necessitate colostomy. This is because the conditions are the disease of the elderly although no age group is exempted. In this study, the mean age of the study population was 45.59. This is comparable with the report of studies done in UK where the mean ages were 42 years.[7] There was male predominance with a male to female ratio of 5:1, comparable to another study in Tikur Anbessa and Darul Sehat Hospital India.[3,8] This figure was lower than those seen at Gandhi Medical College India.[9]

The three most common reasons for colostomy constructions were gangrenous sigmoid volvulus, LBO secondary to colorectal cancer and penetrating abdominal injury respectively in this study. Similar findings were also reported in a study done in black lion hospital Addis Ababa and India.[7,10] It was found that Gangrenous sigmoid volvulus was the most common indication necessitating colostomy. In Ethiopia, the disease is the commonest cause of emergency admissions due to intestinal obstruction.[11] This is similar with the report of a retrospective analysis done at the same hospital and different hospitals in Addis Ababa.[2,8] In this study among traumatic case, penetrating abdominal injury (11.4%) was the most common which is slightly lower than the study done in Saveetha Medical College and Hospital where penetrating injuries accounted 22.9% of the cases. There were three styles of procedures performed during the period and most applied style was end colostomy (66.4%) followed by loop colostomy (30.9%). This is similar to study done in UK, Addis Ababa Black Lion hospital and India.[7,8,12] In contrary in Indian (Hamidia Hospital) study, the most common type of stoma during emergency was loop colostomy (28%) and end colostomy (6%).[13]

Emergency surgery resulted in significantly higher morbidity and mortality for patients. Among colostomy complication rate in our study, end colostomy style had the highest rate of complication compared to the other types of colostomy, similar with the studies done in India and Pakistan.[3,12] In the study done by Engida et al, loop colostomy has the highest rate of complication.[2] The difference could be attributed to difference in study population, which included only emergency patients unlike the other studies that also included elective stomas in their study.

The most common general complications observed in this study were hospital acquired pneumonia and surgical site infection. This is similar with study done by Engida et al.[2] In this study, older age and the presence of complication were significantly associated to increased chance of death ($p<0.05$). The same finding was found in the study conducted by Nishikant et al.[15]

In our study there was a mortality rate of 12% which is Almost comparable to the study done at Gandhi Medical College India with mortality rate of 9% and also similar to the study done by Engida et al with mortality rate of 9.5%.[2,13]

Limitation of this study is its small sample size and failure of inclusion of other elective causes of stoma to see difference in factors associated between emergency and elective colostomies.

CONCLUSION

In conclusion, gangrenous sigmoid volvulus, colorectal cancer and trauma were leading indications for colostomy. Presence of complication and type of colostomy were factors significantly associated with outcome. Avoiding delayed presentation through awareness among the public, aggressive resuscitation, early prompt operation and post-operative close follow-up should be given great emphasis. Optimal and aggressive management of complication might also help in reducing mortality.

ACKNOWLEDGEMENTS

We acknowledge Saint Paul hospital millennium medical college for all the cooperations.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

1. Krishnaswamy J, Kumar S, Mukesh K, Rahman K. A clinical study of intestinal stomas in emergency laparotomy: its complications. Int Surg J. 2017;5(1):273-6.
2. Engida A, Ayelign T, Mahteme B, Aida T, Abreham B. Types and indications of colostomy and determinants of outcomes of patients after surgery. Ethiopian J Health Sci. 2016;26(2):117-22.
3. Shabbir MN, Memon ZA, Nizami M, Khanzada RI. Colostomy related complications. Pakistan J Surg. 2014;24(2):102-4.
4. Ratan SK, Ratan J. Gastrointestinal Stoma-Ileostomy and Colostomy. EC Paediatrics SI. 2018;01:36-41.
5. Shabbir J, Britton DC. Stoma complications: a literature overview. Colorectal Dis. 2010;12(10):958-64.
6. Hendren S, Hammond K, Glasgow SC, Perry WB, Buie WD, Steele SR, Rafferty J. Clinical practice guidelines for ostomy surgery. Diseases of the Colon Rectum. 2015 Apr 1;58(4):375-87.
7. Qureshi A, Cunningham J, Hemandas A. Elective vs. Emergency Stoma Surgery Outcomes. World J Surg Surgical Res-General Surg. 2018;1:1-5.
8. Bekele A, Kotisso B, Tesfaye M. Patterns and indication of colostomies in Addis Ababa, Ethiopia. Ethiopian Med J. 2009;47(4):285-90.
9. Ahmad Z, Sharma A, Saxena P, Choudhary A, Ahmed M. A clinical study of intestinal stomas: its indications and complications.S R Kulkarni, Aditya Chawla. Colostomy done in acute abdomen pain cases: Our experience and review of the literature. MedPulse Int J Surg. March 2018;5(3):88-91.
10. Ali MK. Treatment of sigmoid volvulus: experience in Gondar, north-west Ethiopia. Ethiopian Med J. 1998;36(1):47-52.
11. Sumathi P, Raja A. A clinical study of intestinal stoma their complication and management. OSR J Dental Med Sci (IOSR-JDMS) 2016;15(12):PP39-42.
12. Zeeshanuddin A, Apoorv S. A clinical study of intestinal stomas: its indications and complications. Int J Res Med Sci. 2013;1(4):536-40.
13. Ullah S, Mumtaz N, Ullah MA, Ahmad S. Complications of intestinal stomas. Journal of postgraduate medical institute 2005;19(4):1.
14. Nishikant G, Vijay S. Study of Colostomy: Its Indication and Complication, Int J Sci Res. 2017;6:2.

Cite this article as: Teklewold B, Meskel EG. Retrospective analysis of factors associated with emergency colostomy: an institutional experience. Int J Sci Rep 2021;7(10):484-8.