

## Outcomes of Colostomy Reversal Procedures in Two Teaching Hospitals in Addis Ababa, Ethiopia

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**Background:** Colostomy creation and reversal procedures are common procedures, frequently performed by surgeons working in Ethiopia. Collected information is lacking concerning the outcome of colostomy reversal procedures in the country.

**Methods:** A hospital based retrospective analysis was undertaken to describe the patterns of patients who underwent colostomy reversal, the timing of colostomy reversal, the frequently witnessed complications and the postoperative outcomes of patients admitted to the Tikur Anbessa and Saint Paul hospitals in Ethiopia for colostomy reversal procedure. Data was collected from 87 patients.

**Results:** The majority of patients were males 70(82.8%). Seventy-six (87.4%) of the colostomies were situated in sigmoid colon and Hartmann's colostomy was the most common type in 64 (60.6%). Most colostomies, 69 (79.3%), were created for non-trauma related disease conditions. The interval from the colostomy creation to colostomy closure varied from 8 weeks (2 months) to 72 weeks (18 months) with a mean interval of 28.2 weeks (6.6 months). Most, 71(81.6%) of the procedures were performed by consultant surgeons and the frequently used method was the two layered hand-sewn method in 72 (82.8%) patients. The overall incidence of complication was 17 (19.5 %). The rate of anastomotic leakage is 4(4.6 %). One patient who underwent sigmoid colostomy reversal done initially for gangrenous sigmoid volvulus died after anastomotic leak, making the overall mortality rate 1.1%. More complications occurred during Hartmann's colostomy reversals. The morbidity rate for reversal performed within 16 weeks (4 months) of its creation was 3/28 (10.7%) for those within 16 to 24 weeks, 0/28 (0%); and for those after 24 weeks, 1/29 (3.4%).

**Conclusions and recommendations:** Colostomy reversal is a commonly performed procedure in our setting and should be well mastered by consultant surgeons and residents under training. The associated morbidity and mortality are found to be low. It appears that delayed reversal is more advantageous and safer than early reversal procedures.

### Introduction

Surgeons used to perform colostomies as life saving procedures since a long time. Majority of these procedures are performed in the settings of complicated sigmoid volvulus, colonic injuries and obstructing or perforated colonic cancers<sup>1,2</sup>. The classical Hartman's procedure described by Henri Hartmann more than 80 years ago was an operation for resection of a cancer in the distal sigmoid and upper rectum and the formation of a permanent sigmoid colostomy<sup>3</sup>. Subsequent surgeons have recognized the value of the procedure in acute left-sided colonic disease, such as a gangrenous sigmoid Volvulus, colonic trauma and complicated diverticular disease<sup>4,5</sup>, where the colostomy could be reversed at a later stage when the patient had recovered<sup>6</sup>.

Reversal of a Hartmann's procedure is often considered a major undertaking. Operative mortality rates as high as 10%, morbidity rates of 30%-40% and anastomotic leakage rates of 15% have been reported<sup>7</sup>. It is also reported that almost half of the patients who have undergone a Hartmann's procedure do not have their colostomy closed<sup>1</sup>. Though colostomy creations and reversals are frequently performed by Ethiopian surgeons, collected information is lacking concerning the timing of colostomy reversal, the complications of colostomy closure and final outcome of patients who underwent colostomy reversal procedure. Therefore, this review is intended to present the patterns of patients who underwent colostomy reversal, the timing of

reversal, the frequently witnessed complications and the postoperative outcomes of patients operated upon for colostomy reversal procedure at the Tikur Anbessa and Saint Paul's hospital in Addis Ababa, Ethiopia over a three year period.

## Patients and Methods

The study was a retrospective analysis of patients who underwent colostomy reversal procedure from September 2004- 2007 (Over a three year period) at the two teaching university hospitals in Addis Ababa Ethiopia, namely the Tikur Anbessa Hospital (TAH) and the Saint Paul's Hospital (SPH). Data was collected from the patients' case records by using structured questionnaires. The variables included were the Socio-demographic profiles of the patients, the types and indications of colostomy, timing of colostomy closure, suture techniques, the frequently seen complications during the reversal procedure and the outcome of patients. Statistical software EP-INFO-Ver. 2002 was utilized for data analysis.

Routinely before the procedure, all patients went through bowel preparation, which included colonic lavage through the colostomy and through the anus, laxatives, fluid diet for few days before the surgery and preoperative oral antibiotics. All surgeries were done under general anesthesia. For closure of Hartmann's and double barrel colostomies, the previous incision was re-opened, while loop colostomies were reversed by in-situ mobilization.

## Results

A total of 87 patients were studied. The majority of patients were males 70 (82.8%); the male to female ratio was 4.1:1 and in their 4<sup>th</sup> and 5<sup>th</sup> decades of life 37(42.5%). Most, 55(63.2%) came to the hospitals from a considerable distance from Addis Ababa (See Table 1).

During the study period, there were 155 patients who were operated on for the creation of colostomies. The three most common indications of colostomy creation were Gangrenous sigmoid Volvulus in 56 (36.1%), Colonic cancer in 45(29%) and Colonic trauma in 28 (18.1%). The classical Hartman's and loop colostomy were the most common types of colostomies performed in 94 (60.6%) and 39(25.2%) of the patients respectively. However, from these 155 patients, only 122 patients were discharged with a functioning colostomy, and only 87 (70.1%) of those discharged had their colostomy reversed. Table 2 shows the disease patterns that required colostomy creation and reversal. These included (from the 122 patients discharged with a functioning colostomy) 44/49 (89.7%) of the gangrenous sigmoid volvulus cases, 18/22(81.8%) of the colonic trauma cases and 9/32 (28.1%) of the colonic cancer patients.

Seventy-six (87.4%) of the colostomies were situated in the sigmoid colon, 10(11.4%) in the transverse colon and 1(1.1%) was right-sided. Hartmann's colostomy was the most common type in 64 (73.5%), followed by loop colostomy in 20 (23%) and double barrel 3(3.5%) The interval from the colostomy creation to colostomy closure varied from 8 weeks (2 months) to 72 weeks (18 months) with a mean interval of 28.2 weeks (6.6 months) and a SD of 3.5 months. The mean post-operative hospital stay was 11.9 days.

Most, 71(81.6%) of the procedures, were performed by consultant surgeons; 16(18.4%) were done by residents under training. Reversal of colostomy was frequently performed by using the two layered hand-sewn method in 72 (82.8%) patients and one-layer hand-sewn closure in 15 (17.2%). Primary closure of all colostomy site wounds after thorough lavage was the choice of colostomy site treatment (Table 3).

**Table 1.** Socio- demographic Characteristics of patients who underwent colostomy reversal in Addis Ababa, Ethiopia.

Characteristics	Frequency (N=87)	Percentage (100%)
<b>Age</b>		
10-20	15	17.2
21- 30	16	18.3
31- 40	13	14.9
41- 50	19	21.9
51- 60	15	17.2
61- 70	8	9.10
71- 80	1	1.10
<b>Sex</b>		
Male	72	82.8
Female	15	17.2
<b>Residence</b>		
Out side of Addis Ababa	55	63.2
Addis Ababa	32	36.8

**Table 2:** Indication, Location and type of colostomies during reversal procedures in Addis Ababa

Variables Indications of colostomy	Number (N=87)	Percentage (100%)
<b>Non-trauma</b>	<b>69</b>	<b>79.3</b>
Gangrenous sigmoid	44	50.5
Colonic cancer	9	10.3
High fistula-in-ano	4	4.5
Ileo-sigmoid knotting	5	5.7
Others	7	8.0
<b>Trauma</b>	<b>18</b>	<b>20.6</b>
<b>Sites of Colostomy</b>		
Sigmoid Colon	76	87.4
Transverse colon	10	11.4
Ascending colon	1	1.1
<b>Type of colostomy</b>		
Hartman's	64	60.6
Loop	20	25.2
Double barrel	3	2.6

**Table 3.** Timing of colostomy reversal and suturing technique in relation to the risks of anastomotic leak and death

Characteristics	Frequency N (%)	Leak (%)	Death (%)
<b>Time of closure</b>			
8-16 weeks	28 (32.1%)	3 (3.4%)	<b>0 (0%)</b>
16-24 weeks	31(35.8%)	0 (0%)	<b>0 (0%)</b>
>24 weeks	28 (32.1%)	1 (1.1%)	<b>1 (1.1%)</b>
<b>Suturing technique</b>			
One layer (Vicryl 3/0)	22 (25.2%)	1 (1.1%)	0 (0%)
Two layers (Silk 3/0 and cut gut 3/0)	65 (74.8%)	3 (3.4%)	1 (1.1%)

**Table 4.** Complications observed during colostomy closure and condition during discharge in Addis Ababa

Variables	Frequency	Percentage (100%)
<b>Complications Seen (17/87): 19.5%</b>	<b>(N=17)</b>	
Anastomotic leak	4	23.5
Wound infection	4	23.5
Bleeding	2	11.7
Bladder injury	1	5.8
Anastomotic site stenosis	1	5.8
Adhesion	1	5.8
Wound dehiscence	1	5.8
Incisional hernia	1	5.8
Stricture	1	5.8
Pneumonia	1	5.8
<b>Final outcome</b>	<b>(N=87)</b>	
Improved	86	98.9
Died	1	1.1

The overall incidence of complication was 17(19.5 %). Complications seen in patients with trauma were 4/18(22.2%) and in patients without trauma, it was 13/69(18.8%). Wound infection developed in 4(4.6 %) and anastomotic leakage occurred in 4(4.6 %). One patient who underwent sigmoid colostomy reversal created initially for gangrenous sigmoid volvulus died after anastomotic leak, making the overall mortality rate 1.1% (Table 4). More complications occurred during Hartmann's colostomy reversals 13/17(76.5%), followed by 3/17(17.6 %) for loop colostomies and 1/17(5.8%) for double barrel colostomies. Whether the procedure was done by a consultant or a surgeon under training, there was no statistically significant difference.

The morbidity of left sided colostomy reversal was 15/82 (18.3%) and 1/5(20 %) for transverse colostomies. The morbidity rate for reversal within 16 weeks (4 months) of its creation was 3/28 (10.7%) for those within 16 to 24 weeks, 0/28(0%); and for those after 24 weeks, 1/29(3.4%).

## Discussion

In the study period, colostomy reversal procedures accounted for 87/7888(1.1 %) of all procedures done in the two hospitals. This review revealed male predominance over female and

almost similar distribution of age groups. More colostomy closures were performed for patients from outside of Addis Ababa probably from rural communities. Similar to some authors, this review revealed statistically significant proportion ( $P < 0.001$ ) of colostomy closures performed for pathologies on the sigmoid colon<sup>1,2</sup>. Gangrenous sigmoid Volvulus followed by Colonic cancer were most frequently performed indications for colostomy closure<sup>1,2</sup>.

Although up to half of patients who have undergone Hartmann's procedure might not have their colostomy closed<sup>1</sup>, the rate of colostomy closure (70%) in this series was similar to most authors including colostomy closure in children<sup>1,13</sup>. In our series, we have demonstrated that a significant proportion (71.9%) of patients with colonic carcinoma fail to have their colostomy reversed. These can be explained by the fact that the main indication of colostomy in these patients might be for permanent colostomy intended for simple fecal diversion in the setting of advanced diseases, or following abdomino-perineal resection or some of the potential candidate of closure might have died with their colostomy.

In agreement with some reports, most of the colostomies and colostomy closures were in the left colon<sup>8</sup>. Similarly, in accordance with J. Graham Williams, the classical Hartman's colostomy reversal was the most common type of procedure, followed by loop colostomy closure<sup>4</sup>. Long interval, 8 weeks to 72 weeks, with a mean interval of 28.2 weeks from the colostomy creation to closure was the out come of this study compared to mean interval of 12.2 weeks by some authors<sup>7</sup>. In general, our study and that of Wani SA revealed the optimal timing of closure varies from patient to patient, but report by Cha SH concluded that closure within 6 weeks of the initial operation significantly increased the morbidity<sup>9</sup>, which is in line with our observation of 10.7% morbidity in those who underwent early reversal.

Operative mortality rates as high as 10%, morbidity rates of 30%-40% and anastomotic leakage rates of 15% have been reported<sup>7</sup>. In our series, we have seen that the overall incidence of complication 17 (19.5 %) was lower than that of Cha SH who reported 25% morbidity rate. Anastomotic leakage occurred less frequently or similar to some authors<sup>7-9</sup>. The incidence of complications in our patients with trauma (22.2 %) was found to be significantly lower than those reported by Cha SH who reported 44.4%<sup>9</sup>. In our non-trauma patients, the incidence of complication of 18.8% is found comparable to 15.8% of Cha SH.

The higher rates of morbidity of Hartmann's colostomy reversal than for loop colostomy and for colostomy on left side than transverse colostomies was in agreement to other similar studies<sup>8,9</sup>. There was no statistically significant difference in the outcome or complication rates of colostomy reversal whether the surgery was done by a consultant surgeon or whether two layered or one layered suture technique was used. Therefore, in our setting one layered-interrupted closure method with absorbable suture such as 2/0 Vicryl can be practiced safely. The mean post-operative hospital stay was 13.9 days, which is significantly lower than the report by Wani SA (20 days).

Although, primary closure of all colostomy site wounds was the choice of wound management in our cases, there are few authors who are advocates of delayed primary or secondary skin closure, given the significant risk of wound infection<sup>10,11</sup>.

## Conclusion

We have found out that colostomy reversal is a low morbidity procedure in our setting and the optimal timing of closure varies from patient to patient. Since it is a relatively common procedure, all surgeons including surgeons under-training should be well versed with it. However, it appears that delayed reversal seems more advantageous and safer as compared to

early reversal procedures. Colostomies on the left side are associated with a higher morbidity rate than transverse colostomies or colostomies on the right side.

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### References

1. N.W Pearce, S.D. Scott and S.J Karren. Timing and methods of reversal of Hartmann's procedure, *Br J Surg* 79(1992), pp.839-841.
2. S.A, Albarren, C.Simoens, H.Takeh and P.Mendes da Costa, Restoration of digestive continuity after Hartmann's procedure, *Hepatogastroenterology* 51(2004), pp. 1045-1049.
3. Foster ME, Leaper DJ and Williamson RC. Changing patterns in colostomy closure: the Bristol experience 1975-1982. *Br. J Surg.* 1985 Feb; 142-45.
4. J. Graham Williams. Hartman's operation-Still relevant in the 21th century? *Dig Surg*2005/22:399-400
5. Longo WE et. Al. Risk factors for morbidity and mortality after colectomy for colon cancer. *Dis Colon Rectum.* 2000 Jan; 43(1):83-91.
6. Thomas M. et al. Reversal of Hartmann's procedure: A high-risk operation. *Surgery* Volume 142, issue 4 October 2007, 598-607
7. A.M. Roe, S.Prabhu, A.Ali, C.Brown and A.J. Brodribb, Reversal of Hartmann's procedure: Timing and operative technique, *Br J Surg* 78(1991), pp.1167-1170.
8. Wani SA; Peer GQ. Colostomy Closure in colon trauma *.JK-Practitioner.* 2001 Apr-Jun; 8(2): 92-3
9. Cha SH, Kim BS. Moon DJ, Park JS Closure of the Colostomy *J Korean Soc Coloproctol.* 2000 Dec;16(6):429-435
10. Timothy C. Fabian, MD, FACS; Gregory J. Jurkovich, MD, FACS Current Management of Colon Wounds *ACS Surgery.* 2005; ©2005 WebMD Inc. [<http://www.medscape.com/medscape/journals>]
11. N. Vermulst J. Vermeulen E.J. Hazebroek P.P.L.O. Coene E. van der Harst Primary Closure of the Skin after Stoma Closure *Dig Surg* 2006;23:255-258
12. S.O. Ekenze, N.E.N. Agugua-Obianyo, C.C. Amah Colostomy for large bowel anomalies in children: A case controlled study *International Journal of Surgery* Volume 5, Issue 4, Pages 273-277 (August 2007)
13. S.O. Ekenze N.E.N. Agugua-Obianyo, C.C. Amah Colostomy for large bowel anomalies in children: A case controlled study Volume 5, Issue 4, Pages 273-277 (August 2007)