TYPE, INDICATION OF COLOSTOMY AND DETERMINANTES OF OUTCOME OF PATIENTS AFTER EMERGENCY ABDOMINAL SURGERY AT JUMC BETWEEN SEPTEMBER 11, 2016 TO SEPTEMBER 11, 2017.

BY; AZMERA KABETA(MD, SURGICAL RESIDENT)

RESEARCH THESIS FOR THE PREPARATION OF A SENIOR THESIS TO BE SUBMITTED TO THE DEPARTMENT OF SURGERY, COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENECES, JIMMA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE SPECIALITY CERTIFICATE IN GENERAL SURGERY

Dec, 2018
Jimma, Ethiopia

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ABSTRACT

Background

Intestinal stoma is a very commonly performed procedure with a highrate of complications. Colostomy may be done foremergency or elective surgical conditions for themanagement of wide ranges of congenital andacquired benign or malignant gastrointestinalconditions for two main purposes: diversion of thecolon or decompression of the colon (2,3).

Complications are divided into early andlate. Risk factors are the same as for most ofabdominal surgery: advanced age, obesity,poor wound healing secondary to diabetes,and poor nutrition.

Objective

To describe Types, indication of colostomy and determinates of outcome of patients after emergency abdominal surgery at JUMC between September 11, 2016 To September 11, 2017.

Method

A one-yearhospital based retrospective study, in JUMC, Jimma, Ethiopia from September 11, 2016 To September 11, 2017, which will be conducted using data from patient cards, admission records, operative log books and morbidity & mortality charts at JUMC.Data will be entered into and analyzed using SPSS windows program version 24. Odds ratio and 95% CI will be calculated and $P < 0.05$ will be considered statistically significant.

Results

Out of 50 cases, 20% of age at presentation is between 20-29 and 78% of them are male. 88% of the patients came from rural area and large number of patients, 64% works as a farmer. Hartmann's End colostomy accounts for 28% and 36% of colostomy cases are indicated for Gangrenous sigmoid Volvulus. 13 (26%) out of 50 patients developed complication after surgery. The most common complication is wound dehiscence which is 38% and Out of 13, 6 of them died after they developed complication. The most common causes of death is MOF which accounts for 50%.

Conclusion and Recommendation

Out of 80 cases, 50 of them is evaluated. The most common age and sex at presentation is between 20-29 and Male respectively. Hartmann's end colostomy is the most common type of colostomy and GSV is the most common indication. Wound dehiscence is the most common complication and MODS leaded to death. My recommendation is to give attention for complication which leads to death

Acknowledgement

First of all, I would like to express my deepest gratitude to my advisor Dr. Tilahun for his guidance in helping develop this final thesis.

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ABBREVIATIONS

ICU: Intensive Care Unit

JUMC: Jimma University Medical Center

OR: Odds Ratio

LMICs: Low- and Middle-Income Countries

WCRR: Wide Colorectal Resection

HAI: Hospital acquired infection

GSV: Gangrenous sigmoid volvulus

MOF: Multiple organ failure

CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND

Stoma is a Greek Word meaning ‘mouth’ or ‘opening’. In medicine the termstoma is used when the bowel is exteriorized for fecal or urinary diversion. **(1)**It is one of the mostcommon lifesaving emergency procedures doneworldwide (1,2). Colostomy may be done foremergency or elective surgical conditions for themanagement of wide ranges of congenital andacquired benign or malignant gastrointestinalconditions for two main purposes: diversion of thecolon or decompression of the colon (2,3).**(2)**

In the developing world, benign conditionpredominates, including sigmoid volvulus traumas and ileosigmoid knotting. Colorectal cancers alsotake a good share (6,7). Colostomy hascontributed significantly to reduction in abdominaltrauma related deaths (5). In the developed world,malignant colorectal cancers with or withoutobstruction are common indications. Diverticulitisand ulcerative colitis are also among the commonreasons (2,4,8).

Depending on the way constructedcolostomies are classified into four main types;Hartman’s, loop, double barrel and spectacle. Thechoice of the type of colostomy depends on theindication, the experience of the surgeon and thepatient’s general condition during surgery (2).Hartman’s end colostomy and loop colostomy areconstructed frequently (6).

Colostomies can be temporary or permanent. A temporary colostomy will allow the lower portion of the colon to rest or heal. It may have one or two openings (if two, one will discharge only mucus).A permanent colostomy usually involves the loss of part of the colon, most commonly therectum. The end of the remaining portion of the colon is brought out to the abdominal wall toform the stoma.**(3)**Although it is a lifesavingprocedure, both its construction and reversal havesignificant morbidity and mortality (2,4,11).Complications can be related to the colostomyitself or the indication for it. Common earlycomplications include surgical site infection,wound dehiscence, colostomy necrosis andretraction (6,12). (**2)**

1.2 STATEMENTS OF THE PROBLEM

Approximately 100,000 people in the united statesundergo operations that result in a colostomy or ileostomyeach year. Colostomies and ileostomies are created in themanagement of a variety of medical conditions, including **cancer, diverticulitis, and inflammatory bowel disease**.unfortunately, operations in which ostomies are createdhave high rates of surgical complications in comparisonwith other types of common surgical procedures.

Onerecent population-based study based on national surgical Quality Improvement Program data showed a 37%unadjusted complication rate for elective cases involvingan ostomy, and 55% for emergency operations. Furthermore, risk-adjusted morbidity rates varied significantly among hospitals, indicating the potential to improveoutcomes. However, the true morbidity of ostomy surgeryincludes significant negative effects on quality of life, pluslonger-term morbidity related to ostomy care. Up tohalf of ostomies are "problematic," presenting management problems including skin irritation and pouching difficulties that require prolonged medical care and result inincreased health care costs (prolonged length of stay and/or increased need for outpatient care). As with traditional complication rates, rates of problematic ostomieshave also been shown to vary by hospital unit, suggesting the potential for quality improvement.

Postoperative management problems are exacerbated by poorlyconstructed or sited ostomies, complications followingsurgery, and inadequate perioperative care. the purposeof this clinical practice guideline is to give guidance tosurgeons and other health care providers in an effort toimprove the quality of care and outcomes for patientsundergoing ostomy surgery.**(4)**

1.3 SIGNIFICANCE OF THE STUDY

The result of the study will help;

- ✓ For creating awareness of the commonin dications plus the types and the complications which may help in improving outcomes of patients.
- ✓ To learn more about issues of our patient population for whom colostomies were done
- ✓ Policy makers to gain insight on the role of health education for improvement of early presentation of patients to hospital when they got serious abdominal illness.
- ✓ This study result will give health professionals a better understanding of the patterns of types and indication & determinants of outcome of apatient with colostomy.
- ✓ The outcome of the study will also be of help as baseline for other future researchers.

CHAPTER TWO: LITRATURE REVIEW

A retrospective analysis of records of all patientswho underwent colostomy from January 2011 to

December 2013 at ***St. Paul's Hospital Millennium Medical College (SPHMMC)*** **was conducted in April 2014.**During the two years,253 colostomies were done. Thirty-four (34) cases were excluded for various reasons (17 in completerecordings, 13 missing and 4 pediatrics). Theremaining 219(86.6%) charts were used for analysis. Of these, 151(68.9%) were males with amale to female ratio of 2.2:1. Age ranged from 15to 85 years with a mean of 50.8. Most of the patients, 159(72.6%), came from outside AddisAbaba.In general,emergency surgical conditions make the majorityof the reason for colostomy, 196(89.5%). Thecommon indications for colostomy in decreasingorder were **gangrenous sigmoid volvulus,102(46.6%), colorectal cancers, 46(21.0%),abdominal injuries, 28(12.8%, ileosigmoidknotting, 17(7.8%) and advanced anorectalcancers, 6(2.7%).** Gangrenous colo-colicintussusceptions, intra operative bowel injury,perineal injury and anastomotic leak each accounted for 5(2.3%) of the cases.

The commonest type of colostomy done was **Hartman's end colostomy, 179(81.7%). Loopcolostomy made up 35(16%) of all the colostomies. Double barrel and spectacle** colostomiestogether accounted for only 4(2.3%). Complications were seen on **106(48.4%) patients: in 71(67.0%)males and 35(33.0%) females. There was nostatistically significant difference in the genderand age groups.** Overall, 157 complications were seen. The most common complications were **surgical site infection, 51(23.3%), hospital cquired pneumonia, (10.5%), wound dehiscence,17(7.8%), adhesion obstruction, 15(6.8%) andcolostomy retractions, 13(5.9%).** Rateof complication was higher in those who had loopcolostomy, 57.1% (20 of 35 patients), compared topatients who had Hartman's 46.4% (83 of 179patients).

The figures for colorectal cancer, penetrating abdominal injury, ileosigmoid knotting andanorectal cancer were 29(63.0%), 11(44%),4(66.7%), 5(29.4%) and 4(66.6%) respectively.The indication for colostomy was significant lyassociated with the occurrence of complication(P=0.024).Totally, 198 of the patients were discharged improved, while 21 died making a mortality rateof 9.6%. Multi-organ dysfunction syndrome wasthe most common cause

of death, 13(62.0%).Among patients who died of MODS, 6(46.2%)presented with gangrenous sigmoid volvulus,while 3(23.1%) presented with colorectal cancer.**(2)**

In developing countries, including **Pakistan, India,intestinal perforation resulting from typhoidfever and tuberculosis are common etiologies**andpose a threat because of their high morbidity and mortality. In these patients, most perforations occurin the terminal ileum and at times these perforationsare exteriorized as stomas. **Ulcerative Colitis, Bowel obstruction, Cancer of colon & rectum, Crohn's disease, Congenital Bowel defects, Uncontrolled bleeding from large intestine, Injury to the intestinal tract, IBD enteric perforations, Ischemic Bowel disease are common indications for intestinal stomas.** The surgical technique in stoma formation is important factor for complications and the ease in its reversal.

It is essential to observe sound surgical principles for good results. There are many types of ileostomy but those commonly made are Loop Ileostomy and EndIleostomy.Colostomy involves creating an opening in the abdomen and to bring a portion of large colontodrain and collect stools out of body in colostomy bag.There are many types of colostomy but mostlymade are Loop Colostomy and End Colostomy. **(5)**

This retrospective study was carried out in two neighboring departments of surgery of AustralAfrica: ***The University Teaching Hospital, Lusaka (UTH) and the University Clinics, Lubumbashi(CUL),*** practicing manual colostomy reversals, between 1st January 2007 and 31st December 2009. The study population included all colostomised patients in the two surgical departments. The data were collected from operating theatre lists, from in-wards and out-patient clinic records.Convenient sample size of all colostomies performed during the related period was taken. A total of **124 patients underwent colostomy** in the two departments of surgery during a period ofthree years.

Out of 124 colostomies, 98 were temporary colostomies, giving a proportion permanentcolostomy over temporary of 26/98. 36 of these 98 resections were wide giving 36 wide resectionsby 98 temporary colostomies. Among the 36 patients, there were 19 males (53%) and 17 females (47%). The youngest was 35 yearsold and the eldest 65 years old with a mean age of 50years. Causes of performed WCRR stood asfollows: **gangrenous sigmoid colon**

volvulus: 21(58%); colorectal cancer: 6 (17%); perforatedsigmoid colon diverticulitis 4: (11%), amoebic perforations of descending and sigmoid colon:3;Rectal cancer :2 (6%). All patients (100%) got discharged from hospitals after 2 to 3 weeksdepending of the preformed procedure.

A surgical abdominal site infection was observed in 3 patients (8%). Pelvic pain and discomfort were also observed in postoperative first decade after symphysiotomy and trans-sacral approaches).**(6)**

A retrospective analysis of records of all patients who underwent colostomy from January 2014 to December 2016 at *Krishna instate of medical science was conducted in April 2017*. KIMS is a referral tertiary level teaching hospital in Karad, Maharastra. **56 of the cases were males and 46 were females**. Mean age was found to be 64.8 (min25—max87).**Colonic obstruction and perforation of a tumor in the recto-sigmoid region were the leading causes of peritonitis, seen in 65 cases (65 %).** The remaining reasons were sigmoid volvulus in 9cases (9%), anastomotic leakage originating from previous colonic resections in 8 cases (8%), intestinal adhesions in 7 cases (7%), mesenteric ischemia in 5 cases (5 %), gynecological diseases in 3 cases (3 %), strangulated hernias in 3 (3%).Majority of the colostomies were done for emergency conditions The three most common reasons for colostomy construction were sigmoid volvulus, colorectal cancers and leakage of anastomosis and other reason are intestinal adhesions, mesenteric ischemia, gynecological disease, incarcerated hernia etc. The most common complications were **surgical site infection, hospital acquired pneumonia wound dehiscence, adhesion obstruction, sigmoid necrosis, Anastomotic leakage, necrosis of stoma and perforation peritonitis**. **(7)**

There is a prospective study was carried out in a surgical unit of Hamidia Hospital, Gandhi Medical College, Bhopal from January, 2012 to December,2012. Data was collected by meticulous history taking including age,gender, indication, type of stoma, type of surgery, careful clinical examination, appropriate operative findings andfollow up of the cases. The results were collected, analyzed and compared with other studies.A total of 100 patients were evaluated age ranged between 12- 85 years (50.5 ± 29.01 years) Male (70) to female (30)ratio was 7:3. Of the 100 patients 97 were admitted in emergency while 3 in out-patient department. The mostcommon type of stoma made was loop ileostomy (64%) followed by sigmoid

colostomy (11%) and transverse loopcolostomy (9%). Main indication for a stoma formation was enteric perforation (38%) followed by Koch's abdomen(18%). Of the various complications encountered with intestinal stoma, peristomal skin irritation (36%) was the mostconsistent complication followed by laparotomy wound infection (13%). **(8)**

This prospective study wascarried out in department of general surgery, *Al-Ameen medical college Bijapur from 2006 to 2016*. A total 118 patients of colostomiesdone either elective or emergency setting for any cause was included in this study.| Out of total 118 patients, Males (n=87 out of118) 74% were commonly affected then female (n=31 out of 118) 26%. Maximum number of cases were in 51 to 60 age group (n=35 outof 118) 30%. In the study, 105(89%) stomas are made in emergencysetting and in 13(11%) were made in elective. The most common indication for colostomy formation was carcinoma (n=55, 46.6%), followed by intestinal obstruction(n=28, 23.7%). The most commonly performed colostomy is the sigmoid colostomy 66%, followed by the loop colostomy 28% and least is end colostomy 6%.In colostomy patients total n=57 complications were observed in 54 patients that is 46.4% of patients. In our study the complication was reported as Local sepsis 25%, Prolapse 7%, Retraction 4%, Necrosis 4%, Parastomal hernia 1.6%, Stenosis 1.6%,Intestinal obstruction 1.6%, Bleeding 1.6%. Conclusion: The carcinoma of the colon and rectum is the most common indication for the colostomy. The local sepsis is the most common complication.**(9)**

A research was done to determine the prevalence of stoma formation during abdominal surgical procedures inemergency setting for all the indications in ***Allama Iqbal Memorial Teaching Hospital, Sialkot.*** The study Design was Prospective analytical in Department of Surgery, Allama Iqbal Memorial Teaching Hospital affiliatedKhawaja Muhammad Safdar Medical College, Sialkot; from December 2012 to January2016.All patients of abdominal surgeries operated within 24 hours/ same day of presentation in emergency department were included irrespective of age, presentation and co-morbid pathologies. Patients with known history of malignancies were also included. The surgeries were done by the experienced surgeons not below the rank of senior registrars. The patients without 3 months follow up were excluded from the study. Total of 2243 abdominal surgeries were carried out, 107 patients fulfilling the inclusion criteria, had a stoma either in small intestine or large intestine. **Infections and secondary perforations leading to 33(30.84%) ileostomies/ Exteriorization of perforation**

were the main pathology; while skinexcoriation 19(25.33%)and retraction 5(6.66%) were the complications in small bowel stomas andparastomal hernia 3(4.00%) encountered in colostomies. We had 3mortalities due to **septicemia and patients reporting in late stage**.**(5)**

An observational study was carried out in ***Services Hospital Lahore, over a period of two years from Feb. 2007 – 09***, to identify indications for commonly performed intestinal stomas and to study complicationsrelated to it. A total of 85 patients needing intestinal stomas, ileostomy or colostomy,were included in the study. Patients under 12 years, with enterocutaneous fistula and urinary conduitswere excluded from study. Indications, immediate and late complications of stomas were recorded.The result shows that**Majority (73%) of patients were males**. There were **36 ileostomies and 49 cases of colostomy making a total of 85 patients**. Main indications of Ileostomy were **intestinal tuberculosis (58%), enteric perforation (31%) and penetrating injuries (5.5%).** Colostomy was mostly required in **penetrating injuries (33%), blunt trauma (23%) and intestinal obstruction (28%).** In a total of 35 stomas local complicationsappeared in 54 (41.77%). General problems included anxiety, psychological and social isolation. Skin excoriation and ulceration were the most common (25%); they were worse in ileostomy than colostomy. Inlaparotomy wound infection (9.4%), stoma diarrhea (7%), stoma retraction (6%) and prolapse (6%) wereother notable complications. A mortality rate of 1.6% was found in cases of ileostomy.**(8)**

A study was undertaken in***Government Mohan Kumaramangalam Medical College Salem between December 2014 to December2015***, to study the various types of complication indifferent types of intestinal stomas and their management.Complication was studied in % patients undergoing intestinal stoma formation. Both elective and emergency procedures were included in the study. Data was collected byfollowing up the patient postoperatively and also review in outpatient department. The result was concluded as; **Maximum number of patients were in the group of 55-65 years.** (n= 32 out of 50). **Males (n=36 out of 50) are more commonly affected than females (n= 14).** Stomas constructed are more commonly emergency (n=27) than elective(n=23).Stoma formation is associated with high rate of complication. **Endcolostomy is associated with highest complications.** Complications are more during emergencyprocedure. Local sepsis is the most common and most difficult complication to treat. **(9)**

CHAPTER THREE: OBJECTIVES

General objective

- To study type, indication of colostomy and determinants of outcome of patients after emergency abdominal surgery at JUMC between September 11, 2016 To September 11, 2017.

Specific objectives

- To study the indication of colostomy after emergency abdominal surgery
- To study the various types of intestinal stomas and their indication
- To study the various complications encountered that occurred after construction of intestinal stoma
- To study the determinants of outcome

CHAPTER FOUR:

METHODOLOGY

4.1STUDY AREA AND PERIOD

The study will be conducted in Jimma University Medical Center (JUMC) fromSeptember 11, 2016 To September 11, 2017. JUMC is located 352kms Southwest of Addis Ababa in the city of Jimma. It is one of the oldest teaching hospitals in the country giving services to people living in Jimma zone and serving as a referral hospital in the South-West Ethiopia. It is also serving as a clinical post graduate specialty teaching hospital for Obstetrics and Gynecology, Internal Medicine, Pediatrics & Child Health, General Surgery,Ophthalmology and so on.

4.2STUDY DESIGN

Hospital based retrospective cross-sectional study design for one year will be used in JUMC from September 11, 2016 To September 11, 2017.

4.3Population

4.3.1 Source Population

All patients on whom colostomy was done for emergency surgery between September 11, 2016 To September 11, 2017.

4.3.2 Study Population

All patients who areadmitted to surgical wards with colostomy and undergoneemergency operation in JUMC from September 11, 2016 To September 11, 2017.

4.4SAMPLING TECHNIQUE

- None probability convenience sampling will be used.

4.5VARIABLES

4.5.1 Independent Variable

- Socio-demographic information (Age, Sex, Area of residence, occupation)

4.5.2 Dependent Variables

- Indication for colostomy
- Type of procedure done
- Outcome of the patient
- Types of complication

4.6 DATA COLLECTION TECHNIQUE

First, operation log book records will be reviewed to develop lists of operated cases(including card numbers) who has colostomy for surgical emergency during the study period (September 11, 2016 To September 11, 2017). Then, using patient's card number on the operation log book records, patient's card will be sought out from the hospital's card office. Finally, data will be collected from patient's cardsusing questioner developed for this purpose.

4.7DATA PROCESSING AND ANALYSIS

The collected data will be cleaned, stored and checked for completeness on daily basis. Data will be analyzed by description of major variables, and comparison of relationships among variables using SPSS version 20 software program. Final result will be presented with graphs, tables and narratives based on the nature of data.

4.8 ETHICAL CONSIDERATIONS

Formal letter will be delivered from ethical committee to admission officer, major Operation Room and record keeping unit of JUMC. Privacy of patients will be highly recognized by not exposing their names. Results of the study will be disseminated to concerned bodies only.

4.9 OPERATIONAL DEFINITION

- **Colostomy:** an intentional opening between skin of abdominal wall to colon
- **Ileostomy:** an intentional opening between skin of abdominal wall to ileum
- **Jejunostomy:** isexteriorization of jejunum to abdominal skin.

4.10 DATA QUALITY ASSURANCE

Cautious matching of information on operation notebook to patients' card will be done. The collected data will be checked for accuracy and completeness on daily basis. Any inconsistent data will be rechecked before data analysis.

4.11 LIMITATIONS OF THE STUDY

Since the study will be retrospective the recording might be incomplete or charts might be lost. The study will be conducted in a tertiary and teaching hospital so it may not be a representative of the general population.

4.12 DATA DISSIMINATION PLAN

The result will be commented by the advisors and will be presented to the surgery department and after final comment is corrected the result will be submitted to CBE office. Finally, after appraisal eroticization the article might be published and used as baseline reference

CHAPTER FIVE: RESULTS

5.1 Socio-demographic data

- There were 80 cases which was operated in emergency bases during this study period that is from September 11, 2016 to September 11, 2017. Out of 80 cases, 50 cases were analyzed and used for reporting.
- Out of 50 cases, the most common age of presentation is between 20-29 which accounts for 10(20%) of all cases with mean age of 36years. The least presentation is between 1-9 years.
- 39(78%) of cases who presented at emergency are males and the rest are females which is 22%.
- 88% of the patients came from rural area such as Gomma, Mancho, Lemmu seka etc. and 6% from urban like Jimma. The residence of the rest is not documented for unknow reason.
- Large number of patients works as a farmer which accounts for 64% followed by others like dependency specially for younger age.

Table 1: Age of study population

Age	Frequency	Percentage
< 1 (Infants)	3	6%
1-9	**2**	**4%**
10-19	7	14%
20-29	**10**	**20%**
30-39	8	16%
40-49	6	12%
50-59	8	16%
>60	6	12%
Total	**50**	**100%**

Table 2: sex of a study population

	Frequency	***Percent***	***Valid percent***
Male	***39***	***78.0***	***78.0***
Female	***11***	***22.0***	***22.0***
Total	***50***	***100.0***	***100.0***

Fig 1: Graphic presentation of sex of study population

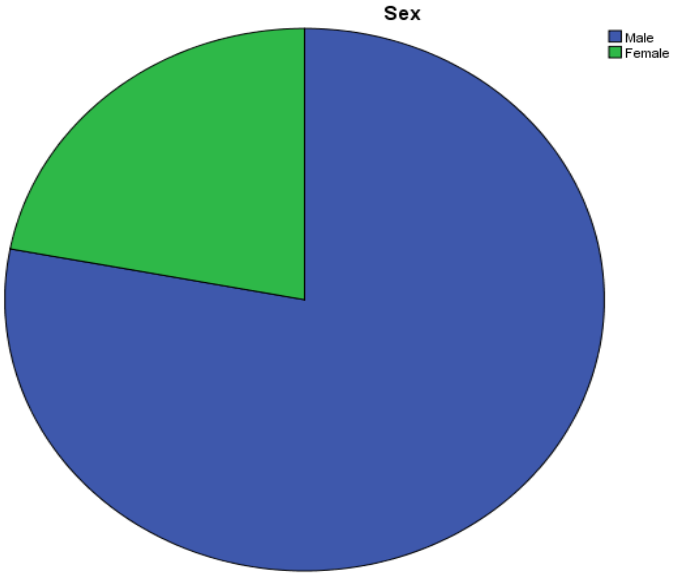

Table 3: Residence of study population

	Frequency	Percent	Valid Percent
Urban	3	6.0	6.0
Rural	**44**	**88.0**	**88.0**
Not Available	3	6.0	6.0
Total	50	100.0	100.0

Table 4: Occupation of study population

	Frequency	Percent	Valid Percent
Farmers	**32**	**64.0**	**64.0**
Governmental Employee	1	2.0	2.0
Others	**12**	**24.0**	**24.0**
Not Available	5	10.0	10.0
Total	50	100.0	100.0

5.2 Types of Stoma

- Out of 50 cases which present at emergency OPD during the study period 14 (28%) Hartmann's End colostomy is done followed by loop colostomy and end colostomy with the same frequency that is 24%. Relatively, Double Barrel is the least common from all and others accounts for 2 or 4% which is diversion colostomy.

Table 5: Types of stoma that was done after emergency abdominal surgery

	Frequency	Percent	Valid Percent
Hartmann's End Colostomy	**14**	**28.0**	**28.0**
Loop Colostomy	12	24.0	24.0
End Ileostomy	12	24.0	24.0
Double Barrel	**10**	**20.0**	**20.0**
others	**2**	**4.0**	**4.0**
Total	50	100.0	100.0

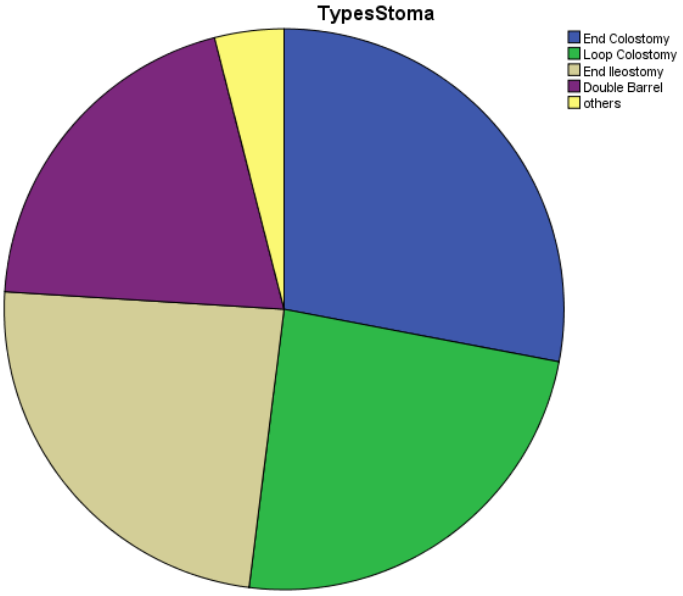

Fig 2: proportion of types of stoma

5.3 Indication for colostomy

- 36% of colostomy cases are indicated for Gangrenous sigmoid Volvulus which is followed by colorectal cancer and intussusception with the same percentage. Penetrating abdominal injury accounts for 10%
- Anorectal cancer and Intra-op bowel injury accounts for 2 %.

Table 6: Indication for colostomy

	Frequency	Percent	Valid Percent
Gangrenous sigmoid volvulus	**18**	**36.0**	**36.0**
Penetrating abdominal injury	5	10.0	10.0
Anorectal cancer	**1**	**2.0**	**2.0**
Perineal injury	4	8.0	8.0
Anastomotic leak	5	10.0	10.0
Colorectal cancer	**6**	**12.0**	**12.0**
Ileosigmoid Knotting	4	8.0	8.0
Intussusception	**6**	**12.0**	**12.0**
Intra-OP bowel Injury	1	2.0	2.0
Total	50	100.0	100.0

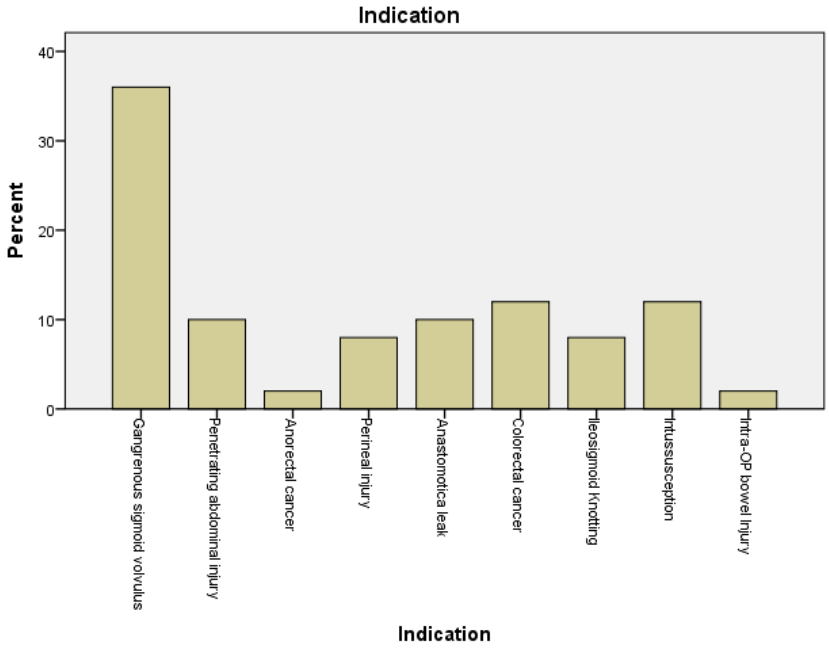

Fig 3: Graphic presentation of indication for colostomy

5.4 Determinants of outcome

5.4.1 Improved

- Out of 50 patients, 92% of them has improved from colostomy after they presented at emergency OPD and the rest has developed complications from the outset which leaded to death.

Table 7: Frequency of patients whom improved after colostomy

	Frequency	Percent	Valid Percent
Yes	**46**	**92.0**	**92.0**
No	4	8.0	8.0
Total	50	100.0	100.0

5.4.2 Complication

- 13 (26%) out of 50 patients developed complication after surgery.
- The most common complication is wound dehiscence which is 38% common followed by surgical site infection(SSI) and hospital acquired infection(HAI) with the same % (15.38%).

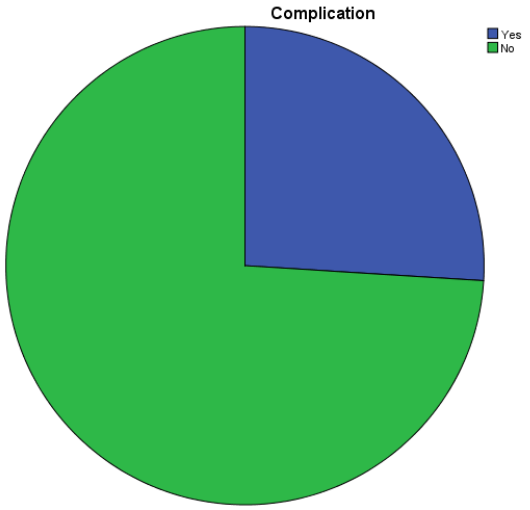

Fig 4: percentage of patients with complication after colostomy is done

Table 8: Types of complication after surgery

Types of complication	Frequency	Percentage
Surgical site infection	2	15.38%
Para colostomy infection	0	0%
Hospital acquired infection	2	15.38%
Wound dehiscence	5	38%
Adhesion Obstruction	2	15.38%
Colostomy retraction	0	0
Colostomy Necrosis	0	0
Colostomy Diarrhea	0	0
Colostomy prolapse	1	7.69%
GI-onset Sepsis	0	0
Para colostomy Hernia	0	0
ARF-Pre-renal Azotemia	0	0
Deep venous thrombosis	0	0
Stromal Stenosis	0	0
Others	1	7.69%
Total	13	100%

- Out of 13, 6 of them died after they developed complication and the rest discharged from the hospital improved.
- The most common causes of death is multiple organ failure which accounts for 50% and the rest is unknown.

Table 9: Frequency and percentage of patients who died after surgery

Death	Frequency	Percent	Valid Percent
Yes	**6**	**12.0**	**12.0**
No	43	86.0	86.0
Not Available	1	2.0	2.0
Total	50	100.0	100.0

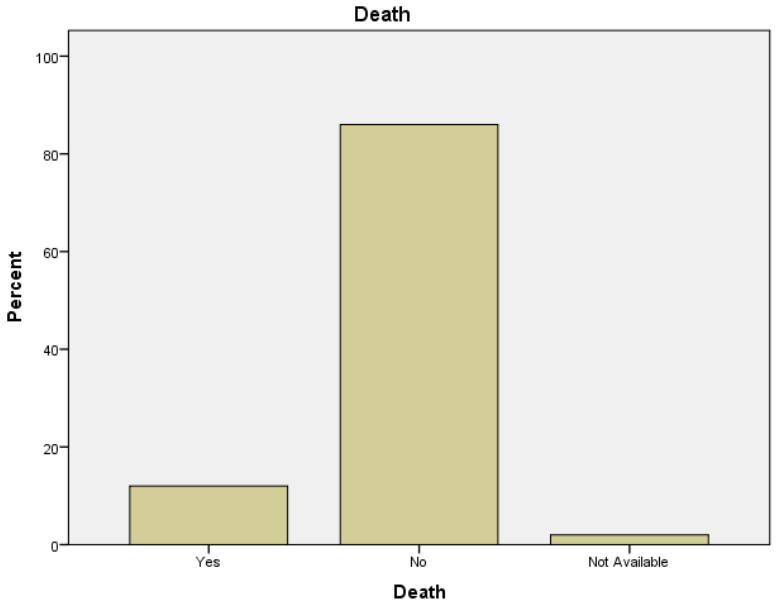

Fig 5: Graphic presentation of frequency of death

Table 10: Cause of death related to types and indication for stoma

Cause of death	Frequency	Types of stoma	Indication for stoma
MODS	**3**	Hartmann procedure	GSV
		Double barrel	GSV
		Loop colostomy	Anastomotic leak
Myocardial Infraction	0	----------	----------
Respiratory Failure	0	----------	----------
Unknown	**3**	Loop colostomy	GSV
		End Ileostomy	Anastomotic leak
		End Ileostomy	Anastomotic leak
Total	6	---------	----------

Table 11. Association of Age, Sex, Indication, Types and Outcome to each other

No	Age	Sex	Types	Indication	Complication	Death
1	50	M	End Ileostomy	GSV	Yes	No
2	**65**	**M**	**End Ileostomy**	**Anastomotic leak**	**Yes**	**Yes**
3	40	F	Double barrel colostomy	Intra-op bowel injury	Yes	No
4	65	F	Loop colostomy	Colorectal CA	Yes	No
5	40	M	Loop colostomy	Penetration Abdominal Injury	Yes	No
6	45	M	Loop colostomy	GSV	Yes	No
7	**1M**	**M**	**Loop colostomy**	**Anastomotic leak**	**Yes**	**Yes**
8	30	M	Double barrel colostomy	Colorectal CA	Yes	No
9	**20**	**M**	**Loop colostomy**	**GSV**	**Yes**	**Yes**
10	**16**	**F**	**End Ileostomy**	**Anastomotic leak**	**Yes**	**Yes**
11	18	M	Double barrel colostomy	Perineal Injury	Yes	No
12	**36**	**M**	**Double barrel colostomy**	**GSV**	**Yes**	**Yes**
13	**45**	**M**	**End Colostomy**	**GSV**	**Yes**	**Yes**

- There is significant association between indication and types of stoma with p-value of **0.009.**
- There is significant association of complication and death with p-Value of **0.001.**
- There is no significant association between types of stoma and complication.

CHAPTER SIX: DISCUSSION

Intestinal Stomas is a common surgical procedure being faced by surgeons both in emergency and elective situations. Stoma formation and its management is known for early and late complications. (5). In our study,out of 50 cases, the most common age of presentation is between 20-29 which accounts for 10(20%) of all cases with mean age of 36.9 years and 78% of all cases are male. Also, 84% of the patients came from rural area and 64% of them works as a farmer. When we compare with the research that is done in *St. Paul millennium Hospital Medical collage* the mean age group is 50.8 and 73% **(2)**of them are male which is comparable to our result.An observational study was carried out in *Services Hospital Lahore, over a period of two years from Feb. 2007 – 09,* and the result shows that Majority (73%) of patients were males.

Out of 50 cases which present at emergency OPD during the study period 14 (28%) Hartman's End colostomy is done followed by loop colostomy and end colostomy with the same frequency that is 24%. Relatively, Double Barrel is the least common from all and others accounts for 2 or 4% which is diversion colostomy. In *St. Paul millennium Hospital Medical college***, the commonest type of colostomy done wasHartman's end colostomy, 179(81.7%). Loopcolostomy made up 35(16%) of all thecolostomies. Double barrel and spectacle** colostomiestogether accounted for only 4(2.3%). **(2)** Prospective study wascarried out in department of general surgery, *Al-Ameen medical college Bijapur from 2006 to 2016*. A total 118 patients of colostomiesThe most commonly performed colostomy is the sigmoid colostomy 66%, followed by the loop colostomy 28% and least is end colostomy 6%.

The indication for different types of stoma found to be 36%for Gangrenous sigmoid Volvulus which is followed by colorectal cancer and intussusception with the same percentage(12%). Penetrating abdominal injury accounts for 10%. Anorectal cancer and Intra-op bowel injury accounts for 2 %. As retrospective study was carried out in two neighboring departments of surgery of AustralAfrica: *The University Teaching Hospital, Lusaka (UTH) and the University Clinics, Lubumbashi(CUL),* a total of 124 patients underwent colostomy in the two departments of surgery during a period ofthree years. Causes of performed WCRR stood asfollows: **gangrenous sigmoid colon volvulus: 21(58%); colorectal cancer: 6 (17%); perforatedsigmoid colon diverticulitis 4: (11%), amoebic perforations of descending and**

sigmoid colon:3;Rectal cancer :2 (6%). In addition to this, a study is done in *St. Paul Millennium Hospital Medical Collage,* Thecommon indications for colostomy in decreasingorder were gangrenous sigmoid volvulus,102(46.6%), colorectal cancers, 46(21.0%),abdominal injuries, 28(12.8%, Ileo-sigmoidknotting, 17(7.8%) and advanced anorectalcancers, 6(2.7%). Gangrenous Colo-colicintussusceptions, intra operative bowel injury,perineal injury and anastomotic leak eachaccounted for 5(2.3%) of the cases.

Out of 50 patients, 92% of them has improved from colostomy after they presented at emergency OPD and the rest has developed complications from the outset which leaded to death. But 13 (26%) out of 50 patients developed complication after surgery. 38% of them developed wound dehiscence followed by surgical site infection(SSI) and hospital acquired infection(HAI) with the same percetage (15.38%). From those who developed complication, 6 of them died and the rest discharged from the hospital improved.The most common causes of death is multiple organ failure(MOD) which accounts for 50% and the rest is unknown.A prospective study wascarried out in department of general surgery, *Al-Ameen medical college Bijapur from 2006 to 2016*.In 57 patients who has colostomy,54 patients developed complications that is 46.4% of patients. In our study thecomplication was reported as Local sepsis 25%, Prolapse 7%, Retraction 4%, Necrosis 4%, Parastomal hernia 1.6%, Stenosis 1.6%,Intestinal obstruction 1.6%, Bleeding 1.6%. Conclusion: The carcinoma of the colon and rectum is the most common indication for thecolostomy. The local sepsis is the most common complication.**(9).**

A study is done in *St. Paul Millennium Hospital Medical Collage,* Complicationswere seen on 106(48.4%) patients: in 71(67.0%)males and 35(33.0%) females. There was nostatistically significant difference in the genderand age groups. Overall, 157 complications wereseen. The most common complications weresurgical site infection, 51(23.3%), hospitalacquired pneumonia, (10.5%), wound dehiscence,17(7.8%), adhesion obstruction, 15(6.8%) andcolostomy retractions, 13(5.9%) (Table 4). Rateof complication was higher in those who had loopcolostomy, 57.1% (20 of 35 patients), compared topatients who had Hartman's 46.4% (83 of 179patients).Totally, 198 of the patients were dischargedimproved, while 21 died making a mortality rateof 9.6%. Multi-organ dysfunction syndrome wasthe most common cause of death, 13(62.0%).Among patients who died of MODS, 6(46.2%)presented with gangrenous sigmoid

volvulus,while 3(23.1%) presented with colorectal cancer(Table 5). Two of the three patients who died ofMyocardial infarction presented with gangrenous sigmoid volvulus and one with foreigner'sgangrene extending to the bowel**(2).**

CHAPTER SEVEN:
CONCLUSION AND RECOMMENDATION

There were 80 cases which stoma was done during September 11, 2016 to September 11, 2017 after they presented at emergency department. Out of 80 cases, 50 cases were analyzed and used for reporting. The most common age and sex at presentation is between 20-29 which is 20% and Male which is 78% respectively. Most of them came from rural area and work as a farmer. Hartmann's end colostomy is the common type of colostomy which is 28% and the indication is GSV which accounts for 36%. 92% patients improved but 13 of them developed complication at some point and 6 of them died from those who developed complication. The most common complication is wound dehiscence. Most of them died because of Multiple Organ Failure. There is significant assocaiton with types of stoma and indication for surgery. In addition, complication is also significantly associated with death. Our research result is mostly related to the research that is done in Addis Ababa and India. My recommendation is to give attention for the most common complication that is leaded to death such as Anastomotic leak.

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QUESTIONNAIRE

Jimma university department of surgery questionnaire for retrospective study to assess the type, indication of colostomy and determinates of outcome of patients after emergency surgery at JUMC between September 11. 2016- September 11, 2017.

Part one: Socio-demographic data

1. Age_____
2. Sex. 1) Male_____ 2) Female_____
3. Residence. 1) Urban _____ 2) Rural _____
4. Occupation 1) Farmers_____ 2) Governmental employee_____
   3) Self-Employed 4) Others_____

Part Two; Types of Stoma (Circle)

1. EndColostomy(Hartmann Procedure) 4) EndIleostomy(loop,double, spectacle)
2. Loop Colostomy 5) Double Barrel colostomy
3. Spectacle
   6) Other _____ Specify_____

Part Three: Indication for bowel stoma(Circle)

5. Gangrenous sigmoid Volvulus
6. Penetrating abdominal injury
7. Anorectal Cancer
10. Colorectal ca
11. Ileosigmoid Knotting
12. Intussusception

8. Perineal injury
9. Anastomotic leak injury
13. Intra-op bowel injury
14. Blunt abdominal

Part four: Outcome

1) Improved 1) Yes_____ 2) No_____
2) Complication 1) Yes_____ 2) No_____
3) If yes to Q2 what kind

A) SSI B) Para-colostomy infection C) HAP

D) Wound dehiscence E) Adhesion obstruction F) Colostomy retraction

G) Colostomy necrosis H) Colostomy diarrhea I) Colostomy prolapse

J) GI onset sepsis K) Paracolostomy hernia L) ARF- prerenal azotemia

M) DVT N) Stomal stenosis

O) Other, Specify_____

4) Death 1) Yes _____ 2) No_____
5) If yes to Q no 4, what Is the cause of death

a) MODS
b) Myocardial infraction
c) Respiratory failure
d) Unknown

----------Thank you----------