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Indications, Types and Postoperative Outcomes of Colostomy in Adults at the Delta State University Teaching Hospital, Oghara. Nigeria

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Abstract

Introduction: In order to either decompress an obstructed colon or divert feces, colostomies are among the most frequently performed life-saving surgeries in the world. The indications are diverse ranging from trauma to malignancy. Associated with the procedure are peculiar complications that may occur.

Objectives: This study aimed to identify the common indications, types, and outcomes of colostomies carried out at the Delta State University Teaching Hospital.

Methodology: A three-year prospective cohort research study was conducted at the Delta State University Teaching Hospital in Oghara between January 2021 and December 2023.

Results: In the course of three years, 19 patients had colostomies. Fifteen (65.2%) of these were males. The age ranged from 26 – 70 years with a mean of 48±14.7 years. There were 13 males and 6 females giving a male:female ratio of 2.2:1. Majority of the colostomies were done to relieve obstruction or protect anastomosis from colorectal malignancies, 13 (68.4%). Devine colostomy was the most often performed type of colostomy, 17 (89.5%). The most common comorbid condition was hypertension. Six complications in total were observed, consisting of three surgical site infections including paracolostomy infections, 3(15.8%), and three stoma-related complications, 3(15.8%). The mortality rate was 6 (31.6%).

Conclusion: Colostomy is mainly done in our environment as a palliative procedure. The main indication is colorectal malignancy. Surgical site infection including paracolostomy infections are notable complications. The mortality rate from underlying disease is still high due to delay in patient presentation. Concomitant cardiovascular disease appears to increase the mortality rate.

Keywords: Colostomy, Indications, Types, Complications, Mortality

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Introduction

Colostomy is a colo-cutaneous fistula created by the surgeon to divert feces and flatus from a distal pathology in colon or anorectum. The procedure was introduced by Littre in 1710[1]. Since then, the original procedure has undergone modifications. It is now a common surgical procedure performed worldwide for congenital or acquired conditions of the anorectum and colon as an elective or emergency procedure with the sole aim of diverting feces and flatus or decompressing the colon[2]. The aim of the former is to reduce fecal contamination of distal large bowel segment in cases of anorectal surgeries or trauma while the latter is performed in cases of bowel obstruction by malignant left colonic tumor and sigmoid volvulus[2,3]. The annual rate of colostomy creation is over 100,000 (US), 80,000 (France) and 20,000 (UK)[4,5]. In Africa, reports are scanty. A report from Kenya indicate that the annual rates range from 6000 to 8000[6]. The incidence of colostomy formation has not been well documented in Nigeria[7].

The indications for colostomy vary between countries and within regions. The main indications include colorectal cancers, inflammatory bowel diseases (IBDs), a diverticular disease with obstruction, penetrating bowel injuries, ischemic colitis, radiation injury, and fecal incontinence[8]. Previously, in low-income countries, sigmoid volvulus and ileosigmoid knotting formed the main indications while colorectal cancers accounted for the majority of cases alongside ulcerative colitis and diverticulitis in high-income countries. However, recent evidence suggest that in both western and African countries, the most common indication is now colorectal cancer[5].

Depending on its indication, colostomies can be temporary or permanent[2]. A temporary colostomy is reversed when it has served its purpose and the patient's condition has improved[2]. The type and site of colostomy also depend on the location of the underlying pathology prompting the colostomy be it congenital or acquired.

Based on the method of colostomy formation, colostomy is classified into four groups: Loop, Hartman's, double barrel and Devine (spectacle). The factors which determine the type of colostomy created include the indication, the experience of the surgeon and the patient's general condition during surgery[2].

The complications that can arise from colostomy formation are grouped as early or late. Overall, complications occur in 10 – 70% of cases[4,9]. Occasionally, the complications overlap. The early complications occur within 30 days of surgery and include hemorrhage, ischemia/necrosis, stoma retraction, mucocutaneous separation, peristomal skin irritation, and parastomal abscess[10–12]. Late complications include stomal prolapse, dermatologic complications, parastomal hernia, and stenosis[11]. Late complications occur in 6% to 76% colostomies. Surgical technique plays a major role in subsequent attendant complications and patient's quality of life[13]. The risk factors which determine higher stoma complication rates include surgical technique, age ≥65 years, female gender, emergency surgery,

transverse colostomy, presence of heart disease, body mass index ≥25; diabetes mellitus; underlying colorectal malignancy; and failure to preoperatively mark the stoma site [2,13–16]. The surgical approach (open or laparoscopic) does not affect complication rates[15]. Re-hospitalization rates increase with time[17]. Re-admission rates are up to 15.3% within 30 days of emergency or elective colostomy creation and up to 41.6% are re-admitted within one week of discharge[17]. Factors that contribute to patient re-admission include chronic heart failure and postoperative stoma-specific complications[18].

Stomal retraction, defined as a stoma that is ≥ 0.5 cm below the skin surface within six weeks of construction results from tension on the stoma[19]. The incidence is 1 – 40%. Obesity is a risk factor because of the increased fat layer thickness and short mesentery[19]. The risk of stomal retraction is higher when stomal height at formation is < 10mm[13]. Women are more prone[13].

Peristomal skin irritation occurs in up to 13% to 73.4% of patients with colostomy formation[8,20]. Peristomal skin complications increase length of hospital stay and re-admission rates[8].

Stomal prolapse, defined as intussusception and outward protrusion of bowel segment through the stoma, occurs in up to 17% of colostomies[9,20]. The risk factors include obesity, factors that increase abdominal pressure, or a poor surgical technique[9].

Parastomal hernia, defined as incisional hernias associated with an abdominal wall stoma, has an incidence of 3 – 50%[9]. The risk factors include age ≥ 65 years, female gender, smoking, steroids, chronic obstructive pulmonary disease, malnutrition, obesity with a body mass index ≥ 25 kg/m^2, diabetes, ascites and Clavien–Dindo Grade III and IV[9,21].

Stomal stenosis and obstruction occurs in 2-15% and the risk factors include ischemia, necrosis, retraction, or fistula formation[9,22].

In-hospital survival rates are up to 92.3% with higher mortality rates in patients who undergo emergency colostomy formation[17]. Mortality rates depend on patient's age, urgency of surgery and underlying diagnosis[23].

Awareness of the types, indications, complications and mortality rates will help in improving outcomes. The purpose of this study was to determine the indications, types, complications and outcomes of colostomies among our patient population.

Setting

Delta State University Teaching, Oghara (5°57′34″N 5°42′09″E), a 250-bed referral hospital, is the foremost teaching hospital in Delta State, Nigeria. The institution serves a population of over 4 million people in the state and receives patients from surrounding states.

Patients and Methods

We conducted a three-year prospective cohort study at the Delta State University Teaching Hospital in Oghara, Nigeria between January 2021 and December 2023. Patients were followed up for 30 days to determine early complications. All consecutive patients older than 18 years of age who had colostomy and consented were

included. Children and adolescents were excluded. All colostomies were performed by either a consultant or senior registrar.

Irrespective of the indication and site, while general anaesthesia, colostomies were formed in the standard fashion. Following skin incision appropriately positioned, anterior abdominal wall layers were incised in turn using scalpel including the peritoneum. The colon was exteriorized. Irrespective of the type of colostomy performed (Hartman's, loop, double barrel, or Devine), the loop was anchored to the fascia using interrupted Vycril 1 sutures after ensuring projection (elevation) of the exteriorized bowel loop 2 cm above the skin level. The subcutaneous fat was anchored to the colon. The exteriorized bowel loop was evaginated on itself and its edges sutured to the wound edges using Vycril 2/0. The stoma was dressed over a colostomy bag. All wounds were inspected daily for 5 days or until discharge. Stoma were subsequently inspected at two-weekly interval for one month.

Early complications looked for were hemorrhage, ischemia/necrosis, stoma retraction, mucocutaneous separation, peristomal skin irritation, and parastomal abscess.

All patients' information were entered into a google form from where an excel sheet containing the patients' data was generated, imported into and analyzed using SPSS version 23.

Results

Socio-demographic Data: There were 19 patients who had colostomy during the study period. The age ranged from 26 – 70 years with a mean of 48±14.7 years. There were 13 males and 6 females giving a male:female ratio of 2.2:1. Most of the patients 5(26.6%) were of the Urhobo ethnic group. The demographic distribution is given in table 1. The highest number of colostomies were done in patients within the ages of 40 – 49 years 6(31.6%).

Table 1: Socio-demographic characteristics of patients who had colostomy between January 2021 and December 2023 at Delta State University Teaching Hospital, Oghara. Nigeria

Characteristic	Number	Percentage (%)
Age (years)		
18 - 29	3	15.9
30 – 39	2	10.5
40 - 49	6	31.6
50 - 59	3	15.9
60 - 69	3	15.9
≥ 70	2	10.5
Gender		
Male	13	68.4
Female	6	31.6
Occupation		
Self-employed	11	57.9
Government employed	8	42.1
Tribe		
Bini	1	53.
Esan	1	5.3
Etsako	1	5.3
Igbo	2	10.5
Ijaw	3	15.8
Isoko	3	15.8
Itsekiri	1	5.3
Okpe	2	10.5
Urhobo	5	26.3

Indications and Type of Colostomy: Most colostomies in this study were done on emergency basis, 16 (84.2%). The indications for colostomy were colorectal malignancy 13 (68.4%), trauma, 5 (26.3%), and intra-abdominal sepsis from anastomotic leak, 1 (5.3%) (Table 2). Among patients who had colostomy done due to abdominal trauma, penetrating injury was the reason in three patients (15.7%). Of these, bullet injuries were 2 (10.5) while stab injury, 1(5.3%). The commonest type of colostomy formed was Devine colostomy, 17(89.5%) followed by loop colostomy (Figure 1).

Table 2: Indication for colostomy in patients who had colostomy between January 2021 and December 2023 at Delta State University Teaching Hospital, Oghara. Nigeria

Indication for Colostomy	Number	Percentage (%)
Intra-abdominal Sepsis (? anastomotic leak)	1	5.3
Trauma	5	26.3
Penetrating abdominal injury	3	15.7
Third degree perineal tear	1	5.3
Traumatic right hip disarticulation	1	5.3
Malignancy	13	68.4
Colonic cancer	6	31.6
Anorectal cancer	7	36.8

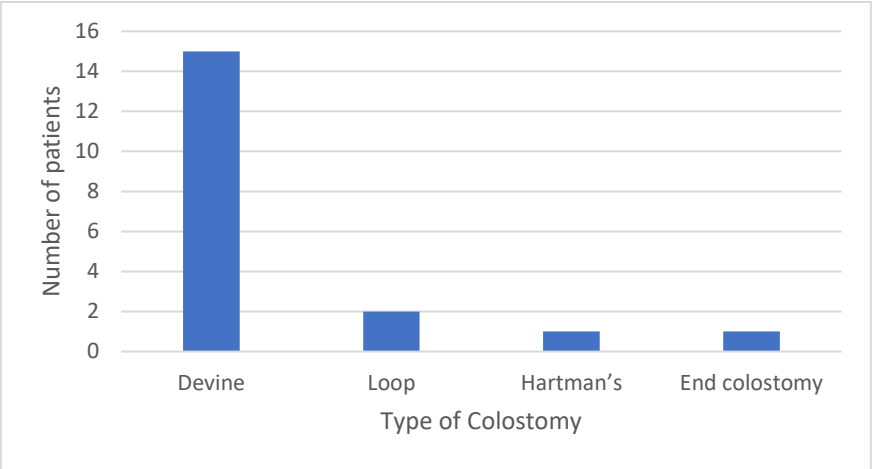

Figure 1: Types of colostomies and their frequencies, between January 2021 and December 2023 at Delta State University Teaching Hospital, Oghara. Nigeria.

Comorbidities: The majority of patients did not have comorbidities. Among the patients however, the most common comorbid condition was hypertension 6 (31.6%) (Figure 2).

Complications: Six patients had complications (31.7%). The most common complication was surgical site infection (15.8%) (Table 3).

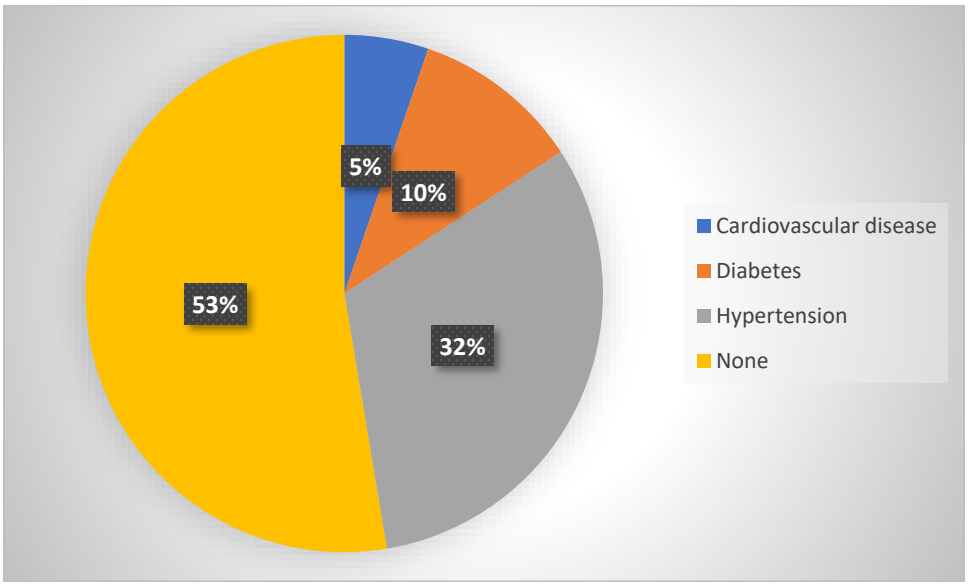

Figure 2: Comorbidities among patients who had colostomies between January 2021 and December 2023 at Delta State University Teaching Hospital, Oghara. Nigeria

Table 3: Type and rate of complications among patients who had colostomy, between January 2021 and December 2023 at Delta State University Teaching Hospital, Oghara. Nigeria

Type of complication	Number	Percentage (%)
Surgical site infection including paracolostomy infection	3	15.8
Colostomy retraction	1	5.3
Colostomy necrosis	1	5.3
Colostomy prolapse	1	5.3
Total	6	31.7

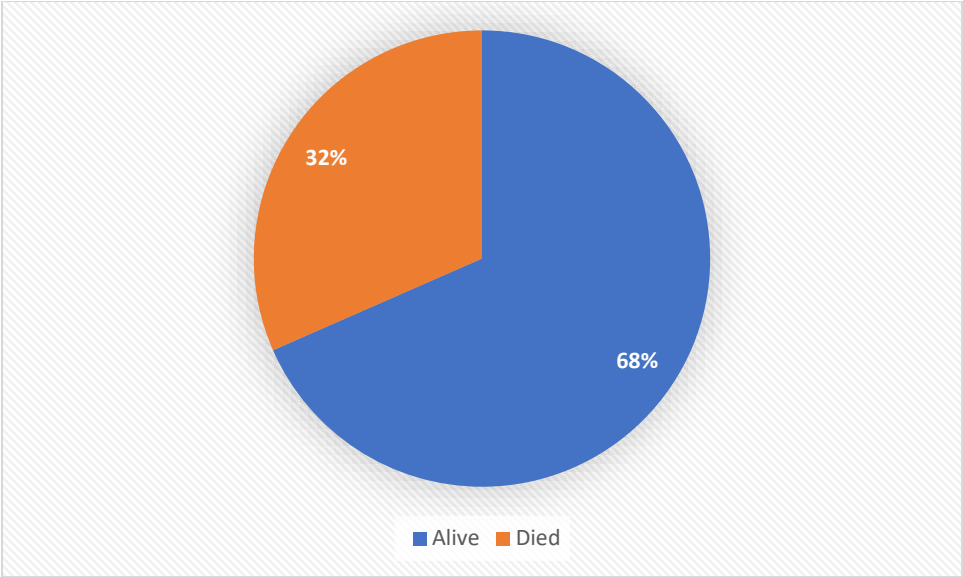

Figure 3. Mortality rates among patients who had colostomies between January 2021 and December 2023 at Delta State University Teaching Hospital, Oghara. Nigeria

Discussion

We set out to look at the indications, types and outcomes of colostomies done in adults in our center among adults from 18 years of age and above. In our series, 73.9% of the patients were above 40 years old. The majority of our patients had colostomy done under emergency conditions similar to reports from other centers[2,7,24]. Report by Ahmad et al, show that elective colostomy is more common in India[25]. This might be due to improved colorectal cancer screening practices in India.

We found malignant obstruction to be the most common indication for colostomy in among our patients accounting for 68.4% of cases similar to reports by Motto and in western countries[5,26]. This is not surprising as awareness of colorectal cancer is low and national screening for colorectal cancer programme does not yet exist in Nigeria. These factors may contribute to delay in patients' presentation. We also found that almost half of this cohort (47.4%) who had colorectal cancer were below the age of 45

years with the youngest patient being 28 years old. This calls for concern about the rising incidence of colorectal cancer in young adults in our environment. This may not be unconnected with high intake of unprocessed red meat, 'suya', pork meat and hides skin popularly known as 'ponmo' in our environment[27,28]. In these patients, colostomy was indicated as a palliative measure similar to the reports by Wuraola et. al. from Western Nigeria but contrasting with reports from Ethiopia[7,24].

Our study shows that males have more colostomies formed than females in a ratio of 2.2:1 similar to existing literature[2,24,25] though lower than figures of 7:3 reported from India[25].

The mean age of our study population was 48±14.7 years. This contrasts with similar studies by Wuraola et. al. from Western Nigeria who had a mean of 52.18 ± 16.85 years[7]. Although colostomies formation tends to increase with age, we note that the age at presentation of patients with malignant obstruction is reducing by 10 - 15 years calling for concern.

Colorectal cancer accounted for 68.4% of the indications for colostomy in this study buttressing the point that malignancy is the most common indication for colostomy in Africa as earlier reported by Motto et. al.[5]. This underscores the need for increased awareness of colorectal cancer in our environment. Trauma was the second most common reason why colostomy was formed in our center. In the majority of trauma cases, we found colonic injury from gunshot to be the most common reason for doing colostomy in our center. This is not surprising because of the rising insecurity in the domain.

Devine colostomy is the commonest type of colostomy done in our center similar to other centers in Nigeria since it completely defunctions the distal limb[7].

The finding of hypertension and diabetes as comorbid condition is unremarkable[16]. The only patient with cardiovascular disease died agreeing with the report by Plonkowski et al[18].

Surgical site infection (SSI) including paracolostomy infection accounted for 15.8% of all complications similar to other reports but less than the 27% reported by Wuraola et. al.[2,7,29] We observed that patients operated under emergency had more SSI. This might have been due to fecal spillage or possible bacterial translocation into the wound.

We observed that the mortality rate was 31.6% with a higher mortality among patients with rectal cancer than colon cancer mostly likely due to late presentation with the colostomy being used for palliation.

Conclusion

Colostomy is mainly done in our environment as a palliative procedure. The main indication is colorectal malignancy. Surgical site infection including paracolostomy infections are notable complications. The mortality rate from underlying disease is still high due to delay in patient presentation. Concomitant cardiovascular disease appears to increase the mortality rate.

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