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Outcome Analysis of Colostomy Closure in Different Pediatric Surgical Conditions: A Pediatric Tertiary Care Hospital Study in Bangladesh

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Abstract

Background: A Colostomy is a revocable surgical procedure an incision in the anterior abdominal wall and suturing it into place in which a stoma is formed by drawing the healthy end of the large intestine or colon through. This opening, in conjunction with the attached stoma appliance, provides an alternative channel for feces to leave the body. Due to anatomical defects frequently referred for closure colostomy, colostomies are often used in cases of imperforate anus and other conditions. The neonatal & children who are unable to pass feces normally and safely. pediatrics colostomy. Some neonates require emergency surgery on their tummy in the first few months of life. It is most commonly due to being born prematurely and developing a bowel problem or a blockage of the bowel. As part of this surgery, the ends of the bowel may be brought to the skin surface to divert stool into a bag called a colostomy. Intended to be temporary with reversal, later on, the stoma allows time for the bowel to rest and recover. Aim of the study: To find out the outcome analysis of colostomy closure in different pediatric surgical conditions and were reviewed to look for complications following closure colostomy. **Material & Methods:** This prospective was conducted in the department of Pediatrics Surgery Bangladesh Shishu Hospital & Institute, Dhaka, and Lubana General Hospital & Cardiac Center, Dhaka, Bangladesh from July 2014 to June 2021. A total of 86 patients who underwent colostomy closure were enrolled in this prospective study as the study population. Data including age, gender, surgical conditions, complications of the patients and oral feeding, and bowel preparation were all collected from the patients' parents or hospital admission files. **Results:** Out of 86 cases included the age range from 8 months-10 years. There were 37(43.0%) females and 49(57.0%) males and there were more difficulties with Anorectal malformation (43.02%) than with Hirschsprung disease (40.7%). There was no record of using Necrotizing Enterocolitis, in surgical patients. The risk of wound infection and leakage was greater than any other consequence in the patients. The illness known as colostomy was predominantly encountered in men. No morbidity was recorded in this study. **Conclusions:** Proper stoma care, the use of well-fitting colostomy bags, and early colostomy closure enhance the prognosis. Prior to surgery, encourage thorough mechanical bowel preparation and antibiotic use. The key to a successful colostomy closure for anti-surgical diseases is appropriate IV feeding after surgery.

Keywords:- Closure of colostomy, Surgery Conditions, Hirschsprung's disease (HD), Anorectal malformation, Wound Infection.

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INTRODUCTION

A temporary colostomy with two apertures into the colon is called a double-barrel colostomy (distal and proximal colostomy is one of the commonest life-saving procedures done worldwide with an intention. It is a surgical operation that produces an opening (stoma) in the large intestine (colon). The opening is created by suturing the healthy end of the colon into place via an incision in the anterior abdominal wall. This aperture, which is often used in combination with an ostomy device, offers an alternate route for feces to exit the body. Attach the upper part of the colon to the stoma, the colostomy, the surgeon will create a stoma (surgical hole) in the abdomen. The stool goes through the stoma and into a collection bag that is attached outside of the body. Have normal digestion and growth, and reduce the risk of infection while they wait for the next surgery, the colostomy allows the baby to excrete waste safely. After the main repair, the colostomy is usually closed for about two to three months the procedure, The surgeon will close the hole in the abdomen and reconnect the two sections of the colon. Through the new rectum within two to three days, babies usually start passing stool and can go home shortly after they begin passing stool. A prosthetic anus takes over if the natural anus is unavailable for that role. Depending on the conditions, it may be reversible or irrevocable. There are three types of colostomy methods, I. A loop colostomy is a type of colostomy usually used in emergencies and is a temporary and large stoma. Held in place with an external device, a loop of the bowel is pulled out onto the abdomen. II. End colostomy is created from one end of the bowel. The other portion of the bowel is either removed or sewn shut (Hartmann's procedure). III. A double-barrel colostomy is severed and both ends are brought out onto the abdomen. Only the proximal stoma is functioning. Most often, the double-barrel colostomy is a temporary colostomy with two openings in the colon (distal and proximal). The elimination occurs through the proximal stoma. Between the performance of a colostomy and its closure, in every instance an interlude that may be as long as 10 weeks should be allowed. The site of the colostomy becomes walled off, local immunity to the infected contents of the intestine develops, any infection in the wound subsides, and the wounds from technical procedures carried out on the distal colon heal which enables the patient's general condition to improve. If the colostomy was performed to decompress or exteriorize a traumatized normal colon, this time may be drastically shortened. Occasionally, it returns to its normal route through the site of the anastomosis. the colostomy partially or completely closes itself after the obstruction has been removed, which permits the fecal current The closure should be delayed until the edema and induration of the bowel about the colostomy opening have subsided and the intestine has resumed a normal appearance. The patency of any anastomosis of the intestine distal to the colostomy should be assured by a contrast study using fluoroscopy. For colostomy closure, two methods followed single-layer and double-layer suture. Single-layer is a suturing method the bowel is approximated by one layer of stitches. The single-layer suture includes inversion suture and eversion suture. In neonates, inversion sutures are to be avoided because they can reduce the lumen diameter. For this reason, eversion suture is

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recommended for neonatal. It can increase adhesion formation but not interfere with the luminal passage. Double layer closure is not recommended for neonatal surgery because of luminal compromise, poor submucosal apposition, avascular necrosis, and prolonged healing time. A colostomy is used to treat many children who have congenital or acquired big bowel problems. The most prevalent reasons for colostomy in children are Hirschsprung's disease (HD) and anorectal abnormalities.[1,2] It's designed to decompress a clogged big intestine while also safeguarding a future low bowel anastomosis. Colostomy also reduces fecal contamination of the urinary system in anorectal abnormalities. Colostomy development and closure have been linked to significant morbidity and death in several studies.[2] A colostomy may be either temporary or permanent, depending on the reason for the diversion.[3] Although the majority of decompressing intestinal stomas in children are transitory, and repair of the underlying issue typically results in closure of the diverting aperture, a well-built temporary stoma is frequently inevitable and lifesaving.[4] A permanent, well-functioning stoma helps to an enhanced quality of life in numerous cases with non-curable and devastating pathologic diseases of the lower digestive tract.[5] Prolapse, stricture, retraction, skin excoriation, parastomal herniation, and stomal hemorrhage are among the most prevalent significant consequences of colostomies.[6,7] The underlying ailment, the child's health state, and the presence or absence of stoma-related problems all influence the timing of colostomy closure.[8] Unnecessary delays in reestablishing intestinal continuity have been shown to enhance morbidity.[9] A loop colostomy is a temporary and big stoma that is often utilized in emergencies. An external device holds a loop of bowel on the belly. The intestine is then sutured to the abdomen, and two stomas, one for feces and the other for mucus, are formed in the same stoma. End colostomy is a stoma is made from the bowel's one end. The remaining intestine is excised or stitched shut (Hartmann's operation). The colon is cut and both ends are taken out onto the belly in a procedure known as a double-barrel colostomy. The proximal stoma is the only one that is operational.). The proximal stoma is used to eliminate the waste. Planned colostomy surgery has a greater long-term success rate than surgery conducted in an emergency. People with sigmoid colon or descending colon ostomies may be eligible for irrigation, which enables them to avoid wearing a pouch and instead wear a gauze cap over the stoma. They may also plan irrigation during times that are convenient for them.[9] Irrigation is accomplished by inserting a catheter into the stoma and flushing it with water, allowing the feces to exit the body and into an irrigation sleeve.[10] Most colostomies irrigate once or twice a day, depending on the individual, their dietary consumption, and their overall health.

Here are the key topic areas for parents caring for a child who has had colostomy closure surgery:

- Managing diaper rash
- Preventing constipation: The constipation challenge
- Post-closure nutrition
- A parent's checklist for colostomy closure recovery

While surgeries can help repair the parts of the body needed to pass solid waste, it cannot

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always restore the nerves and sphincter muscles the body relies on to tell a child when it's time to go to the bathroom. In cases where there are missing or damaged nerves or sphincter muscles, severe constipation, or difficulties with potty training, a bowel management program may be needed.

OBJECTIVES

The objective of the study was to find out the outcome analysis of colostomy closure in different pediatric surgical conditions in pediatric tertiary care hospitals in Bangladesh.

MATERIAL AND METHODS

This prospective study was conducted in the department of Pediatrics Surgery Bangladesh Shishu Hospital & Institute, Dhaka, Bangladesh from July 2014 to June 2021. A total of 86 patients who underwent colostomy closure were enrolled in this prospective study as the study population. Data including age, gender, surgical conditions, complications of the patients and oral feeding, and bowel preparation were all collected from the patients' parents or hospital admission files. Age, gender, surgical conditions, complications of the patients and oral feeding, and bowel preparation were all collected from the patients' parents or hospital admission files. The data were analyzed using Statistical Package for Social Sciences (SPSS) version 23. The continuous data were presented as mean and standard deviation.

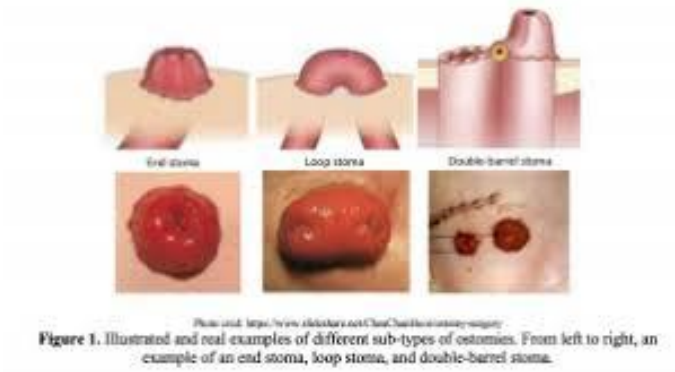

Figure 1. Illustrated and real examples of different sub-types of ostomies. From left to right, an example of an end stoma, loop stoma, and double-barrel stoma.

Figure 2: Sigmoid Colostomy

Figure 3: Loop Colostomy

RESULTS

Out of 86 cases included the age range from 8 months-10 years. There were 49(57.0%) males and 37(43.0%) female children.

[Table 1] showed that surgical conditions of the colostomy in patients were mostly seen in Anorectal malformation were 37(43.02%)

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followed by Hirschsprung disease (HD) 35(40.7%) patients The other surgical condition cloacal anomalies were 5(5.81%), intussusception 4(4.5%), enterocolitis 3(3.1%) patients. Except these there were some more surgical conditions applied in patients which were Rectal atresia 2(2.32%) patients and colonic atresia 1(1.16%). There was no record of using Necrotizing enterocolitis, in surgical patients.

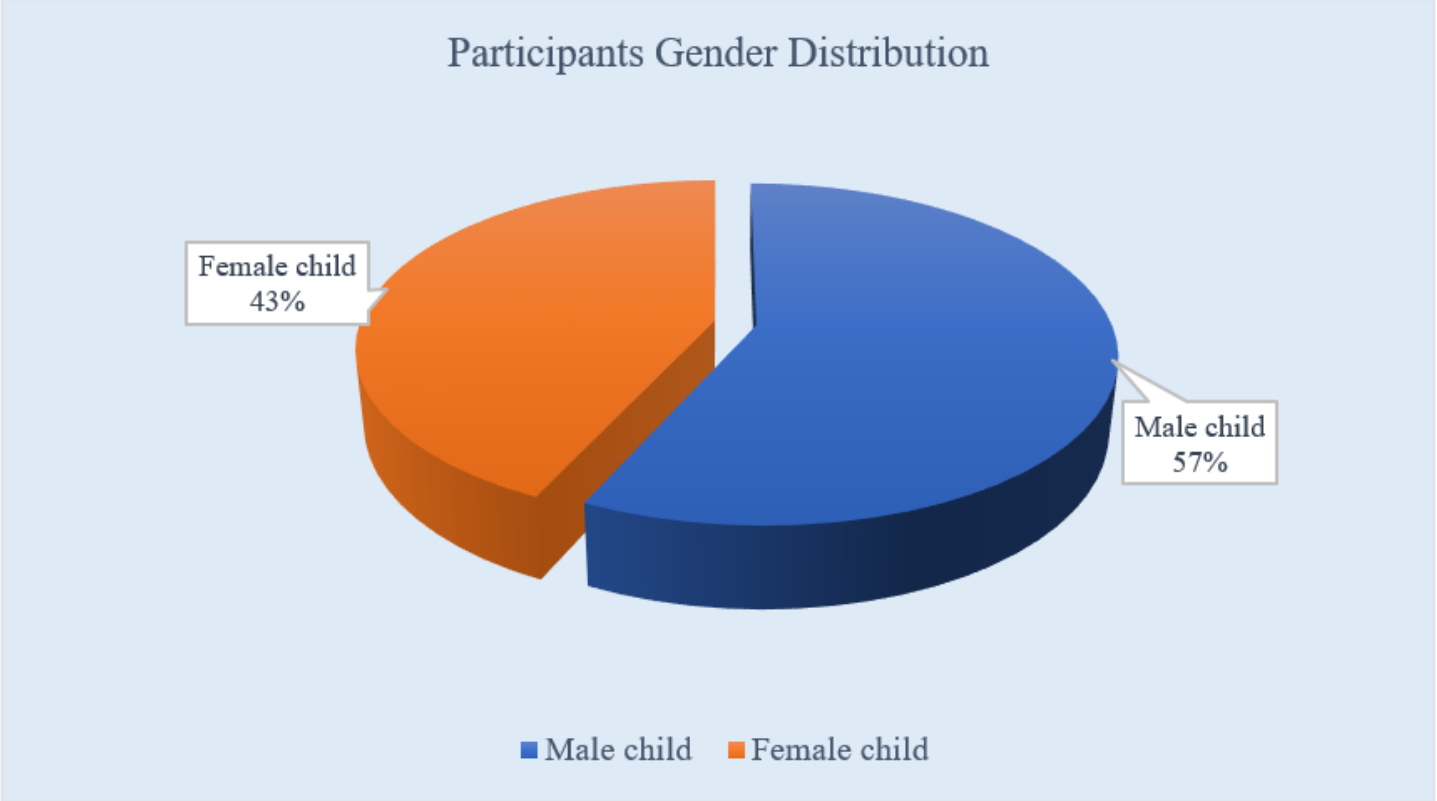

Figure 4: Gender wise Participants Distribution(N=86)

Table 1: Surgical Conditions of the patients (N-86)

Surgical conditions	Frequency (n)	Percentages (%)
Anorectal malformation	37	43.02
Hirschsprung disease	35	40.7
Cloacal anomaly	5	5.81
Intussusception	4	4.5
Enterocolitis	3	3.1
Rectal atresia	2	2.32
Colonic atresia	1	1.16
Necrotizing enterocolitis	0	0.0

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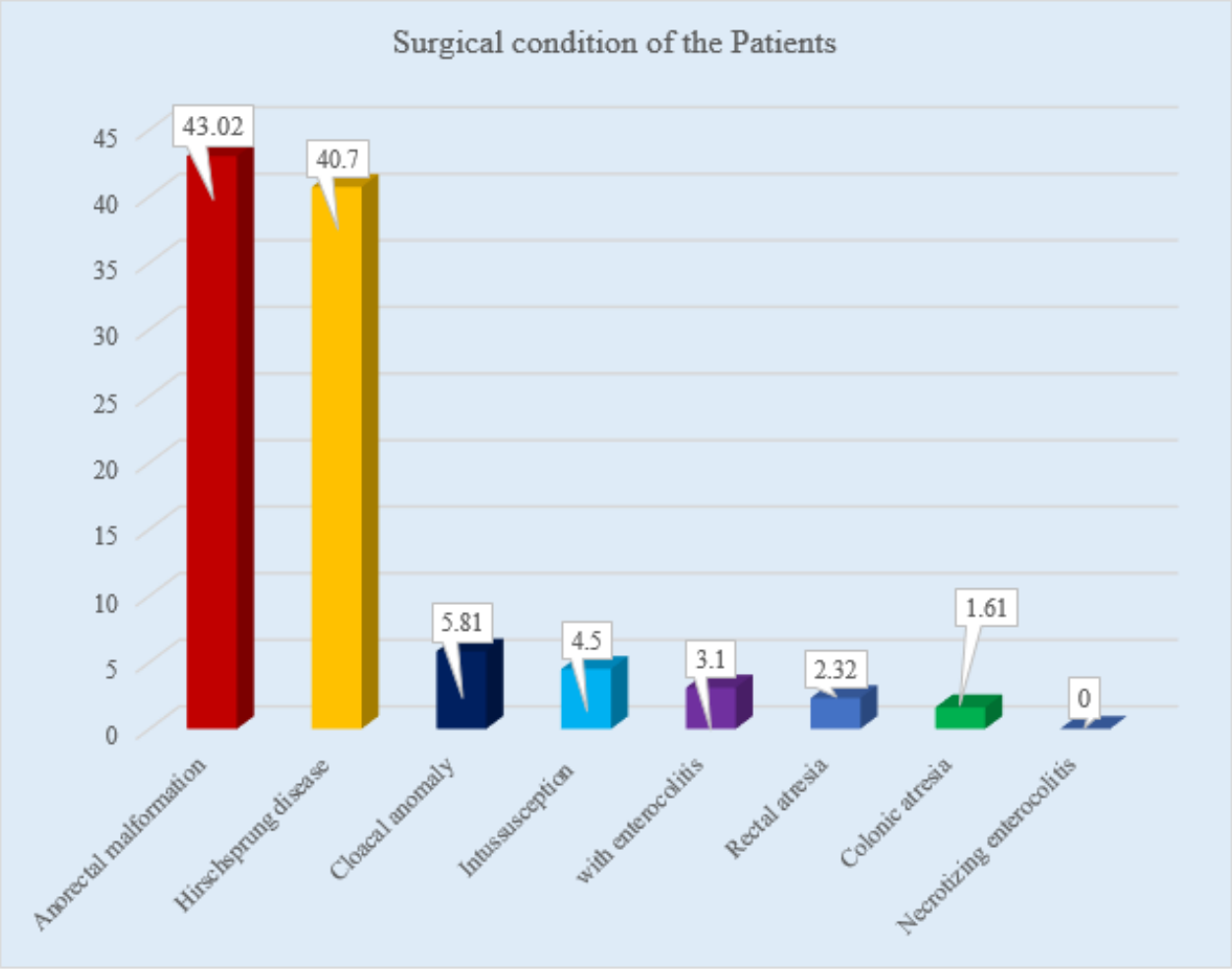

Figure 5: Surgical condition of the Patients (N=86)

Table 2: Pre-operative preparations preceding colostomy (N=86)

Variables	Frequency (n)	Percentage (%)
Pre-operative preparation		
Yes	80	80.0
No	20	20.0
PCV%, Mean ±SD	35±2.3	
Prophylaxis antibiotics		
Yes	84	84.0
No	16	16.0

[Table 2] showed that in pre-operative preparation 80% was prepared and 20% was not prepared. PCV%, Mean ±SD was 35±2.3. In prophylaxis antibiotics, 84% were yes and 16% were no.

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Table 3: Patient's complications after the surgeries (N=86)

Complications	Frequency (n)	Percentage (%)
Wound Infection	5	5.81
Leakage	5	5.81
Incisional Hernia	2	2.32
Intrabdominal abscess	2	2.32
Hypertrophic scar	2	2.32
Unacceptable scar	1	1.16

[Table 3] showed the complications that were present in patients' bodies after the surgeries. Mostly seen are the wound infection of about 5(5.81%) patients and leakage of about 5(5.81%) patients. And also seen intrabdominal abscess 2(2.32%), hypertrophic scar 2(2.32%), incisional hernia 2(2.32%), and finally unacceptable scar 1(1.16%).

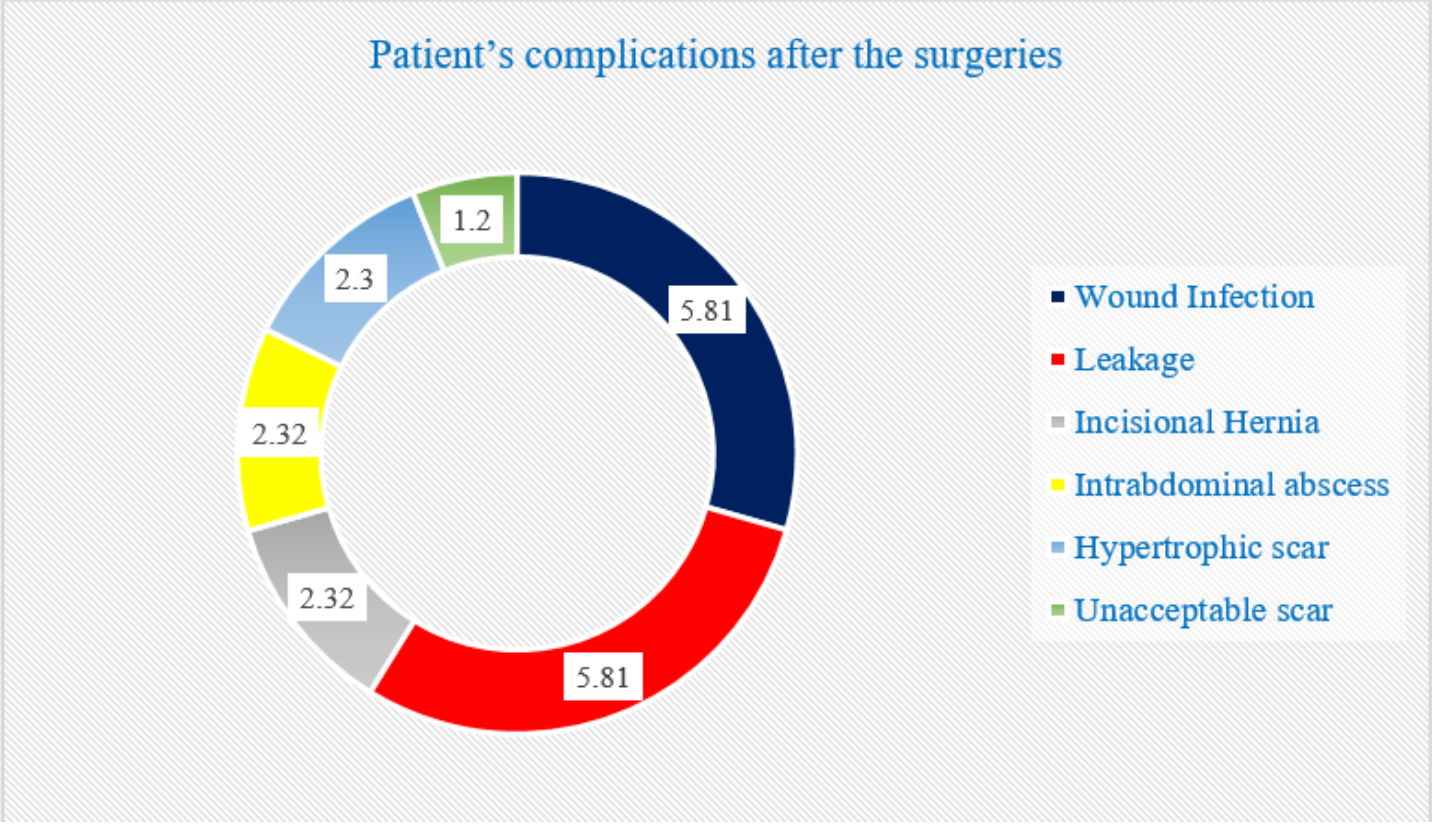

Figure 6: Patients Complications After Surgery (N=86)

DISCUSSION

A closure colostomy is a routine procedure performed frequently by pediatric surgeons all over the world, it is an elective procedure that is assumed to be easy, reproducible, and with minimal or no morbidity, yet, the literature

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indicates that this procedure still may be the source of significant complications. A closure colostomy may be influenced by a number of circumstances, including Age; those who had problems had a median age of 3 years, which was similar to Nasir, A.A. et al, who had a median age of 3 years, and a complication rate of 41.9%.[9] While those without issues were around the study's median age, it's possible that the delay in colostomy creation and closure led to the development of these difficulties in older individuals. as well as the fact that participants in this research had a greater rate of HD and AM. According to Chandramouli et al,[4] there was a greater risk of problems (39.9%), with (101 males) and (101 girls) (45 girls). It's due to problems connected to the basic disease, such as a greater prevalence of intestinal blockage and malnutrition in HD patients. This has an impact on the patients' healing processes and overall health. In this research, patients were given bowel preparation for two days before surgery, however, another investigation found that Eighty-two patients had their bowels prepped prior to surgery, and 37 (45.1%) of them suffered difficulties that might have been caused by insufficient preparation. Rickwood et al. also found a reduction in wound infection with mechanical preparation and preoperative antibiotics; he had a wound infection rate of 16% but this research revealed a wound infection rate of 5.81%,[8] which is lower than prior studies. The time gap highly related to morbidity was not found in this research, as patients who experienced problems had their colostomies closed in an average period and close to those who did not. Most of the patients pass their first bowel motion on the 3rd to 4th postoperative day, and they received a fluid diet on the 5th postoperative day, and discharged home one to two days later, in the postoperative period, no nasogastric tubes were used, the patients received intravenous fluid, as well as antibiotics for 5-7 days, The total hospital stay was from (6-13) days. By "Crowding" big bite, small bite, slitting the antimesenteric border, and cutting the smaller lumen obliquely; to maintain a good blood supply, we cut on the antimesenteric border, when there is size discrepancy during bowel anastomosis overcome.[11,12]

CONCLUSIONS

There were more difficulties with Anorectal malformation than with Hirschsprung disease. The risk of wound infection and leakage was greater than any other consequence in the patients. The illness known as colostomy was predominantly encountered in men. This research revealed minimal morbidity, and oral feeding was initiated during the third postoperative period with no signs of ileus. Decompression of the nasogastric tube proceeded for another 24 hours. The patients received intravenous fluid, as well as antibiotics for 5-7 days, most of the patients pass their first bowel motion on the 3rd to 4th postoperative day, and they received a fluid diet on the 5th postoperative day, and discharged home one to two days later. The total hospital stay was from (6-13) days. By "Crowding" big bite, small bite, slitting the antimesenteric border, and cutting the smaller lumen obliquely; to maintain a good blood supply, we cut on the antimesenteric border, when there is size discrepancy during bowel anastomosis (especially with long time stoma) overcomes.

Recommendation

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The prognosis is improved by proper stoma care, the use of well-fitting colostomy bags, and early colostomy closure. Encourage adequate mechanical bowel preparation and antibiotic usage prior to surgery. Single-layer bowel anastomosis is recommended because it takes less time, requires less tissue handling, and narrows the already tiny intestine lumen. When there is a size mismatch during bowel anastomosis, competent surgical judgment is required to overcome it. Post-operative proper IV nutrition is the milestone for successful closure of colostomy for anti-surgical conditions.

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