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Original Article

Incidence of Complications of Colostomy in Children with Hirschsprung Disease and Anorectal Malformation

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ABSTRACT

Colostomy formation, A surgery used in the management of Hirschsprung's disease, and anorectal malformations. colostomy complications were represented both in children with Hirschsprung's disease and in those with anorectal malformation **Objective:** To estimate the incidence rate of major complications after colostomy formation surgery. **Methods:** A prospective longitudinal descriptive study was performed to calculate the incidence rates of complications following the surgical intervention of colostomy formation. All 200 cases of consecutive young children (age 2 days to 60 days) who received a colostomy between (date January 2017 to January 2020) were included. The incidence of major colostomy-related complications was calculated. This was analyzed for colostomy formation. Non-colostomy-related complications were not included in study. **Results:** 200 young children were included. And a follow-up of 6 months of this study to review the complications of colostomy formation in infants and children with Hirschsprung's disease or an anorectal malformation. 80% experienced colostomy-related complications, colostomy prolapse (35% in HD more with a transverse colostomy, 20% in Anorectal malformation), colostomy stenosis (15% in HD, 35% in Anorectal malformation), Skin excoriation (40% in HD, 25% in Anorectal malformation), Revision of colostomy (15% in HD, 12% in Anorectal malformation), colostomy bleeding almost same in both conditions 30%, Parastomal herniation, 5% in both conditions, colostomy wound infection were also recorded, Same in both conditions 5%. **Conclusions:** Consider the risks associated with a colostomy formation before undergoing surgery in both Hirschsprung's disease and anorectal malformation. complications can be excluded with careful surgery and proper nursing care.

INTRODUCTION

Two congenital malformations like Hirschsprung's Disease and Anorectal malformations. Both end up in colostomy. There is a wide clinical variety. Mostly colostomy is recommended in the very starting period of life when the reconstructions and sustainability seem to be impossible. The next phase is the closing of colostomy which is done in the later period of life. So colostomy formation and closure are two different surgeries [1]. The study involves colostomy formation. While Hirschsprung's disease. A stoma is formed if the bowel is not decompressed and we see cases of dilated colon. sometimes pull-through surgery is done and in case of stoma is formed. The stoma is closed after the aganglionic part of the colon is resected [2]. The maldeveloped rectum was operated on on the 6th day of birth. Since then the stoma and colostomy formation had been done and preferred in neonatal life. The colostomy is further divided on the bases of location and condition of the severity of the malformation [3]. Many studies had been addressed to differentiate the colostomies on the basis of location transverse and sigmoid colostomy. there is another division of loop and split but the division on the basis of location is more

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deliberately recommended [4]. Likewise in Hirschsprung's disease, the colostomy depends on the part of the a ganglionic colon involved. the location of the transition zone mainly defines the type of colostomy [5]. The literature is available on the basis of loop and split colostomy. The loop colostomy. the bowel is not completely divided and sutured in the abdominal wall. While in split colostomy, there is a differentiated gap between the colostomies and they have such a big gap, without covering the efferent loop the stoma cap is placed on an afferent loop. The stool movement in the mucus fistula is prevented. Which leads to urinary tract infections [6]. Mostly the overflow leads to bacterial growth and contamination. Another procedure named, the Hartman procedure is mostly recommended in the literature for the dilated colon as in Hirshsprungs Disease and in anorectal malformations [7]. When divided on the bases of location the colostomy can be placed anywhere. in the ascending descending and sigmoid colon. The most frequent location for the colostomy is the transverse and sigmoid (descending) colon if we do the efficacy comparison of the transverse and sigmoid colostomy the transverse colon is more mobile and there are more chances of prolapse than in the sigmoid colon [8]. We can also say that there is a greater risk of prolapse in transverse colostomy than in sigmoid. Identifying the exact location of colostomy placement is quite challenging during surgery [9]. Specifically in the case of Hirschsprung's disease. When the bowl is abnormally distended. Mostly the placement of colostomy, in this case, is done far distal point. which lead to the revised surgery also the insufficient length is challenging in reconstruction [10]. However. The colostomy formations involved a variety of cases. On the bases of locations and procedures for Hirschsprung's disease and anorectal malformations both. What to be done is decided during surgery and we can say that everyone has their own pros and cons [11]. Where should a colostomy be placed totally depends on the surgeon's experience and the circumstance during the surgery. So we took cases of 200 children and calculated the complication rates to evaluate the efficiency of the colostomy formation. transverse or sigmoid. The study compared two surgical techniques, transverse and sigmoid (descending) colostomies. Colostomy formation is divided on the bases of cite of colostomy , transverse colon, and descending/sigmoid colon.

METHODS

A prospective longitudinal descriptive study performed to calculate the incidence rates of complications following the surgical intervention of colostomy formation. All 200 cases of consecutive young children (age Age 2 days to 60 days) who received a colostomy between (date Date January 2017 to January 2020) were retrospectively included. The incidence of major colostomy-related complications was calculated. This was analyzed for colostomy formation. Non-colostomy-related complications were not included in the study. The major colostomy related complications including; colostomy prolapse, colostomy stenosis, colostomy skin excoriation, infections, and bleeding. The study highlighted the major complications for which the revision colostomy in done. The mean and SDs are calculated to prove the significance of study and incidence of complications. The study provided a comparison of Hirschsprung's disease and Anorectal malformations. The total number of male patients included in the study with Hirshprung's disease was 108 and the total number of male patients with Anorectal disease was 32. On the other hand number of female patients with Hirshprung's disease was 32 and total number of female patients with Anorectal disease was 22. described in table 1.

Clinical detail	Hirschsprung's disease (n – 140)	Anorectal malformations (n – 60)
Male	108	32
Female	32	22

Table 1: Relative frequency of Hirshsprung's disease and Anorectal malformation in males and females

The total number of patients of Hirshprng's disease and Anorectal disease was 140 and 60 respectively. The complications in the cases were cumulative 80% in 160 patients. And the level of significance was less than 0.05 the other percentages are discussed in table 2.

Disease	N	Total complications in colostomy, n(%)	Colostomy Prolapse, n(%)	Colostomy Infection, n(%)	Colostomy Stenosis, n(%)	Other complications of colostomy, n(%)	Revision surgery, n(%)	Bleeding, n(%)
Hirshsprung's	140	160 (80%)	35%	5%	15%	5%	15%	30%
Anorectal	60		20%	5%	35%	5%	12%	30%
Total	200		P<0.05					

Table 2: Frequencies of complications

In Hirschsprung's disease, the transverse colostomy was done in 8 patients and the sigmoid colostomy was done on 72 patients. The relative frequencies were 10% and 90% respectively. And for anorectal disease, the transverse colostomy was done on 12 patients and the sigmoid colostomy was done on 108 patients. The relative frequency was 10% and 90% respectively for both. discussed in table 3.

Colostomy site	Hirschsprung's disease		Anorectal malformations	
Cite of colostomy	(n = 80)	Relative frequencies	(n = 120)	Relative frequency
Transverse colostomy	87	10%	12	10%
sigmoid	2	90%	108	90%

Table 3: Preferable site of colostomy distribution

In all 200 cases, 80% of cases developed complications and were reported in 6 months of follow-up. Colostomy

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Prolapse, Sometimes after the surgery, the intestines shift towards the site of the surgery also called incision sight. In this study, this complication was more reported in transverse colostomy than in sigmoid or descending colostomy. Occurs in both Hirschsprung's disease and anorectal malformation. prolapse (35% in HD more with a transverse colostomy, 20% in Anorectal malformation) shown in figure 1.

Figure 1: Stoma prolapse in a patient with HD

Another complication is stenosis, which might develop after surgery due to inflammations at the operative site. Occurs in both Hirschsprung's disease and anorectal malformation. colostomy stenosis (15% in HD, 35% in Anorectal malformation). shown in figure 2.

Figure 2: Stoma stenosis of sigmoid loop colostomy in case of anorectal malformation

Sometimes due to incontinence the newly created stoma suffers from skin excoriation that is traumatized part of the operated wound Skin excoriation (40% in HD, 25% in Anorectal malformation), Parastomal herniation, 5% in both (HD and anorectal malformations) conditions. colostomy wound infection was also recorded, the Same in both conditions 5%. (HD and anorectal malformations). shown in figure 3. Revision of colostomy (15% in HD, 12% in Anorectal malformation). colostomy bleeding is almost same in both conditions 30%.

Figure 3: Wound infection and retraction of stoma

DISCUSSION

The children who are born with hirshsprungs disease or anorectal malformations must undergo by the surgery of colostomy formations that might ends in compications depending on the variability of surgical technique or improper nursing care. The morbidities are common but we cant ignore the mortalities that are low in case of both mentioned diseases in the study but we cant ignire the percentages of 3% proven by the literature and demographics. Pena et al, calculated the difference in loop and sigmoid colostomies as 64% and 36%. The study provides support to our investigations as well. Similar findings have been calculated [3]. Our study provided evidences of complications significantly proven to be 80% whereas the literature reports prove the incidence of complications above 91% [5]. Ciğdem et al estimated the complications rates of 47%. With minor complications of skin excoriations. And furthermore the study investigated the hospital admissons of more that 8% in certain cases. Minor infections and bleeding incidences were also reported but the hospital admissions were nor required [6]. Patwardhan et al, estimated the colostomy formation complications in loop and sigmoid colostomy and found no difference in them [10]. The preferable site for the colostomy proven to be sigmoid and descending colon with less chances of prolapse and complications [11]. The systemic reviews compare the effects of colostomy formations and the challenges they might face. The complications rate are more common in underdeveloped countries where proper nursing care is nor available. Sometime morbidities lead towards the reconstructions of colostomy formation. And reconstruction of the stoma site is also performed [12]. A study was conducted in the UK on the incidence rate of colostomy-related complications.

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And they got significant findings for prolapse and stenosis. Which is also confirmed by our study. That retrospective study also included some minor complications. Which include infections, bleeding, and skin excoriation [13]. Colostomy prolapse remained the most prevalent complication. Proven by the literature. And for this, the revision colostomy is the solution [14]. Some studies also support the high incidence of skin excoriation and irritation up to 42%. Skin excoriation leads to minor surgery [15]. And the infections are mostly treated by medications. Colostomy formation must be supervised by strict supervision and proper nursery care. Otherwise, the incidence rate of complications increases [16]. Colostomy dysfunction is a result of inappropriate surgical technique. And due to operative planning and technique [17]. Another complication is small bowel adhesive obstruction these cases are also reported mostly in cases of Hirschsprung's disease who have gone through a laparotomy also. And this complication is significantly less frequent in patients with an anorectal malformation, who have undergone sigmoid colostomy formation [18, 19]. The children who have gone through colostomy formation surgery at an early neonatal reported fewer complications than the children above one year [20]. However, it is concluded that the morbidities associated with colostomy formations are less than 3%. however, the complication rate is quite high up to 97% in the literature [21]. Major complications are associated with morbidities and revision surgery in cases of minor complications like skin excoriations there are fewer hospital admissions reported. The literature for skin excoriation is mostly related to loose stool and location or colostomy at transverse colon than in sigmoid cases. In some cases, gel capsules are given for stool formation. Some complications are more clinically important and treated without surgery redo [22]. Mostly the preferable site of colostomy is transverse and sigmoid. Both complications mentioned in the study and literature mostly follow a sigmoid surgery [9]. The transverse zone colostomy is also performed and it has more incidence of complication. The division of colostomy is mostly studied by loop and split cycle which is not included in this study [23]. During surgery, the decision is made that what will be the best suitable site for the colostomy formation. mostly is Hirschsprung's disease, sometimes the part of the a ganglionic segment is too large that the colon is not sufficiently washed out by the rectum so colostomy formation is a must [24].

CONCLUSIONS

Consider the risks associated with a colostomy formation before undergoing surgery in both Hirschsprung's disease and anorectal malformation. complications can be excluded with careful surgery and proper nursing care.

Conflicts of Interest

The authors declare no conflict of interest

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