

# Closure of Emergency Intestinal Stoma in the Same Hospital Stay

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## ABSTRACT

**Objectives:** To assess the effectiveness of early stoma closure in terms of complications and hospital stay during management of initial operation.

**Background:** Construction of a temporary intestinal stoma is a common pediatric surgical problem. They are associated with complications which are difficult to control. These temporary stomas need to be closed as soon as possible.

**Material and methods:** Fifty children of different age groups, in which temporary stoma was constructed for various pathological conditions were studied to assess the results of early stoma closure in terms of complications as well as the duration of hospital stay. Seven (14%) patients were neonates of intestinal obstruction, 9(18%) had typhoid perforations whereas 34 (68%) presented with gut perforation due to trauma. Colostomy was made in 60% patients of which 90% were loop and 10% were divided colostomies. In rest of the 40% patients ileostomy was done of which 20% were divided and 80% were loop ileostomies. The average time between stoma formation and closure was  $12.84 \pm 1.82$  days, with minimum and maximum days as 10 days and 16 days respectively. The mean hospital stay was  $24.46 \pm 3.51$  days with minimum and maximum hospital stay as 15 and 36 days respectively. Four (8%) patients developed abdominal distension, wound infection occurred in 7 (14%), anastomotic leak, enterocutaneous fistula and adhesion-obstruction developed in 1(2%) patient each.

Early closure of temporary stoma created during the initial operation can safely be done in the same hospital stay.

**Key words:** Stoma, Colostomy, Ileostomy, Early and delayed closure.

## INTRODUCTION

In pediatric patients intestinal stoma is constructed for a variety of traumatic and nontraumatic conditions. Congenital obstructive lesions of gastrointestinal tract like anorectal malformations, intestinal atresias, Hirschsprung's disease complicated meconium ileus, inflammatory conditions such as Necrotizing enterocolitis, gastrointestinal and perineal injuries are the usual conditions where a stoma may be needed<sup>1</sup>. It can also be constructed as an emergency life saving procedure in clinically unstable neonates and children with trauma.

They are used for various purposes like decompression, diversion, protection of distal anastomosis or exteriorization of involved segment by a pathological condition, etc<sup>2</sup>. Treating a child with a stoma can be challenging because of complications like dehydration, electrolyte imbalance, difficult pouch fitting, peristomal skin excoriation, psychological and social impacts etc, associated with it<sup>3</sup>. As a rule, majority of stomas

are for temporary use and are typically reversible in children. Routine closure of these stomas is not theoretically performed before two to three months. In developing countries like Pakistan, stomas are ill managed due to poor education, poverty, and unreliable supply of appliance. In order to reduce the stoma related morbidity it might be advisable to opt for early closure<sup>3</sup>. The purpose of the study was to assess the effectiveness of early stoma closure i.e. during the same hospital admission as the initial operation in terms complications and hospital stay.

## PATIENTS AND METHODS

This descriptive study was conducted at the Department of Paediatric Surgery, King Edward Medical University/ Mayo Hospital Lahore over a period of two years i.e; from June, 2007 to May, 2009. Convenience sampling technique was adopted where 50 patients of pediatric age undergoing temporary stoma formation were included in the study. The patients remained

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admitted till the stoma was closed. Patients of Hirschsprung's Disease, anorectal malformation, anal sphincter injury and those needing permanent stoma for various reasons were not included in the study. Patients with severe intra-abdominal sepsis, malnutrition and poor general health were also not included. Patient's file was the main source of information for this study. Important relevant information was transferred from these files to specifically designed proforma. Statistical package for social sciences (SPSS) version 11 was used for the processing purpose. The patients were discharged home after closure of stoma in the same admission.

### RESULTS

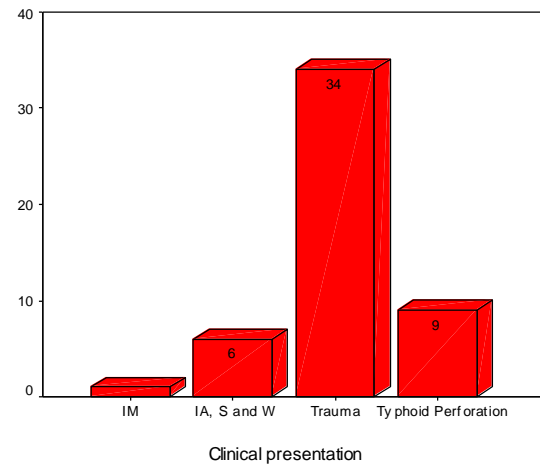
The mean age of patients was  $5.50 \pm 3.58$  years with minimum and maximum age as 4 day and 12 years. The median age of the patients was 5 years and the most frequent age was 8 years. There were 29 males and 21 females patients in this study. Male to female ratio was 1.38:1. Mean body weight of the patients was  $15.12 \pm 7.52$  Kg. with minimum and maximum weight as 2 and 29 kg respectively. There were 6 patients of small bowel atresia, stenosis and webs, 1 patient of intestinal malrotation, 9 had typhoid perforation and 34 patients presented with the history of trauma (Graph-1). Among these 34 traumatic patients, 16 had road traffic accident (RTA) and 18 were of fire arm injuries (FAI). Colostomy was made in 60% patients of which 90% were loop and 10% were divided. In rest of 40% patents ileostomy was done of which 20% were divided and 80% were loop ileostomies.

The average time between stoma formation and its closure was  $12.84 \pm 1.82$  days, with minimum and maximum time as 10 days and 16 days respectively.

The mean hospital stay was  $24.46 \pm 3.51$  days with minimum and maximum stay as 15 and 36 days respectively. The median hospital stay was 20 days which was the most frequent hospital stay as well. According to individual hospital stay 1 patient stayed for 15 days, 4 stayed for 16 days, 7 stayed for 19 days, 31 stayed for 20 days, 4 stayed for 23 days and 3 patients stayed for 36 days (Graph-2).

Thirty six patients did not develop complications after stoma closure. Four patients developed abdominal distension, wound infection occurred in 7, anastomotic leak, enterocutaneous fistula and adhesion-obstruction developed in 1

patient each (Graph-3). All the patients developing abdominal distention were the neonates of small bowel atresia, stenosis and web. Wound infection was mainly found in patients presenting with trauma, and patients having anastomotic leak, enterocutaneous fistula and adhesion obstruction also belonged to same group. Reanastomosis (on fourth post operative day) was done in patient of anastomotic leak and the patient remained in hospital for 15 days more than the regular patients. Patients with enterocutaneous fistula and adhesion obstruction were managed conservatively with additional time period.

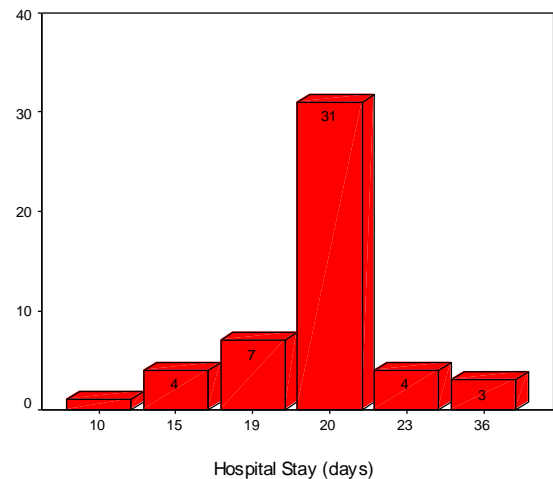


### Key Words

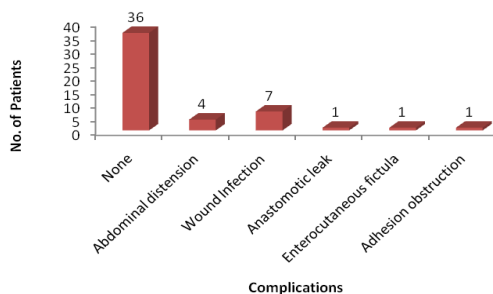
IM : Intestinal Malrotation

IA, S, and W : Intestinal Atresia, Stenosis and Web

Graph – 1: Clinical Presentations



Graph-2: Hospital Stay



**Graph- 3: Post stoma closure Complications**

## DISCUSSION

Construction of intestinal stoma is a common and established procedure in surgery<sup>4</sup>. Colostomy is a commonly constructed intestinal stoma in children and majority are performed during neonatal period for congenital malformation<sup>5,6</sup>. A stoma may also be constructed as an emergency life saving procedure in neonates and children who are clinically unstable<sup>7</sup>.

A transient stoma should lower the operative risk and be closed as soon as possible. The morbidity and mortality rates after ileostomy or colostomy are rather high. Several studies have compared colostomy closure with ileostomy closure, finding a multitude of factors influencing the complications of stoma closure, such as the surgeon's experience, perioperative treatment, timing of the operation, and the surgical technique<sup>8,9</sup>. Stoma constructed to protect a distal anastomosis, is usually not closed earlier than two to three months. Theoretically an earlier closure might reduce stoma-related morbidity, improve quality of life, and still effectively protect the distal anastomosis.

The mean age of patients in the present study was  $5.50 \pm 3.58$  years with minimum and maximum age as 4 days and 12 years respectively. In a study conducted in Nigeria by Osifo D, et al reported mean age of 3 months  $\pm 2.1$  but with almost similar age range (2 days to 15 years)<sup>10</sup>. Congenital anomalies were the major indication for colostomy in young children or neonate compared with acquired pathology in older children and this is in conformity with international literature<sup>4</sup>.

The average time period between stoma formation and closure was  $12.84 \pm 1.82$  days, with minimum and maximum periods as 10 days and 16 days respectively. The risk for fistula formation

after an intestinal anastomosis is maximum between 5<sup>th</sup> and 7<sup>th</sup> post operative day. Likewise, the stoma should be closed earlier enough to avoid post operative fibrosis leading to difficult peristomal dissection. This situation usually develops on around 15<sup>th</sup> postoperative day. Day 10, therefore was considered the average safe time for stoma closure.

In various international studies, wound infection and overwhelming sepsis were the main causes of morbidity and mortality<sup>11</sup>. In the present study the wound infection was seen in 7(14%) patients which is comparable with other studies. The limitation of the present study was that only the feasibility of early stoma closure was considered without comparing it with delayed closure group. However, in comparison with other studies which analyzed the results of both early and late stoma closure, the results of present study are comparable with those of early closure of those studies. Other complications like abdominal distension (8%), anastomotic leak (2%), enterocutaneous fistula (2%) and adhesion-obstruction (2%) were small in number. Bakx et al had no mortality and four minor complications after early closure: superficial wound infection (n = 2), intravenous-catheter sepsis (n = 1), small bowel obstruction (n = 1)<sup>12</sup>. Jordi\_Galais et al, reported wound infections in 20% cases of early closure and 4% cases of late closure group. Time to recovery of bowel activity and to resumption of oral feeding was equal in the two groups. They concluded that early closure of bowel stoma can be performed without major complications in elective patients<sup>13</sup>.

In the present study the mean hospital stay was  $24.46 \pm 3.51$  days with minimum and maximum stay as 15 and 36 days respectively. The median hospital stay was 20 days which was the most frequent hospital stay as well. Jordi\_Galais et al, reported longer mean hospital stay in the delayed group ( $34.5 \pm 18.6$  days) than in the early group ( $23.1 \pm 4.6$  days) ( $P < 0.01$ )<sup>13</sup> whereas it was 36 (14-84) days, and 22 (18-29) days ( $p < 0.01$ ) respectively in the study presented by Menegaux et al<sup>14</sup>. The findings in the early closure group are similar to our study. It was concluded that small bowel stomas could be safely closed in selected healthy patients on postoperative day 10 without major complications<sup>14</sup>.

Bakx et al reported that early closure of the stoma was possible by 11<sup>th</sup> post operative day<sup>12</sup>. Early closure of the stoma had no adverse effect

on functional results or quality of life quality and the results were similar in the two groups<sup>14</sup>. Osman K, et al. also recommended early closure of temporary ileostomy in suitable patients during the same hospital admission as it causes less stoma-related complications with similar accomplishment as the late closure<sup>15</sup>. In another study by Krand et al stoma-related complications like peristomal skin excoriation, ill fitting pouches, psychosocial stresses and concerns of care givers were significantly greater in delayed group patients (44% vs. 16%) while the stoma closure complications were similar in both groups (16% vs. 8%)<sup>16</sup>.

## CONCLUSION

Early closure of intestinal stoma is effective with less complications and shorter hospital stay resulting in reduction of treatment cost.

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