ORIGINAL ARTICLE

# Primary anastamosis versus colostomy in patients with penetrating colonic injuries: A compartive study

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**Abstract**

**Objectives: To compare primary anastamosis versus colostomy in patients with penetrating colonic injuries**

**Materials and Methods: This randomized control trial was conducted at Surgical 'A' and 'B' Units, Postgraduate Medical Institute, Lady Reading Hospital, Peshawar. The duration of the study was six months in which a total of 290. i.e. (145 in each group) patients were enrolled. Open randomized sampling was adopted and after following all ethical measures and informed written consent was taken from all the patients. SPSS v.20.0 was used as a statistical instrument where descriptive calculations were taken for categorical and numerical variables.**

**Results: This study shows that mean age in primary anastamosis was 33±2.81 years while in Colostomy was 32±2.13 years. In primary anastamosis group 80% patients were male and 20% patients were female while in colostomy group 85% patients were male and 15% patients were female. In effectiveness, the results of primary anastamosis were 95% effective while colostomy showed effectiveness in only 85% patients.**

**Conclusion: Primary anastamosis is safe and has excellent results as compare to colostomy in the treatment of penetrating colonic injuries.**

**Keywords: Primary anastamosis, defunctioning in colostomy, penetrating colonic injuries, effectiveness**

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**Introduction**:

Penetrating abdominal trauma in the form of fire arm injuries or stab wounds or any other type of injury is supposed to be one of the most common and fatal emergencies that a general surgeon has to face.[1] Globally, the frequency of penetrating abdominal trauma is increasing, in the US alone, penetrating injuries comprise approximately about 6 % of hospitalization and account for the 2nd most common mechanism of fatal injuries after motor vehicle related injuries; the same accounts for at least 20% of all injury related to deaths.[2,3] This incidence is almost the same worldwide but in under-developed countries affected by social and domestic violence like Pakistan the number is more than others and particularly involves the colon, because of its size and anatomical fixity is prone to injury in all such cases.[4,5]

Although the treatment strategy for colorectal trauma has seen advancement during the last part of the twentieth century and results have improved but still problems such as high septic complications rates and mortality rates exists. So, the standard management for colorectal trauma is still a controversial issue.[5] With the advent of better trauma management and facing the complications of colostomy along with its closure and re-hospitalization; surgeons now advocate primary repair. Literature suggests that randomized trials comparing primary repair to diversion and demonstrates no significant difference in complication rates between the two groups.[2] While other studies comparing the complication rates between the two groups found that primary repair has less complication rates as compared to colostomy.[3,6] Wound infections was also less in the anastamosis group as

Table 1: *Age distribution in the sample*

| | **Mean±SD** | **P-Value** |
|---|---|---|
| Age | Group-A (primary anastamosis) | Group-B (colostomy) |
| 20- 30 years | 44(30%) | 46(32%) |
| 31-40 years | 48(33%) | 44(30%) |
| 41-50 years | 39(27%) | 36(25%) |
| 51-60 years | 14(10%) | 19(13%) |
| Total | 145(100%) | 145(100%) |
| Mean and SD | 33±2.81 years | 32 ±2.13 years |

compared to colostomy group.[7] Colostomy is no longer the standard treatment option because of its own complications and the need for subsequent surgery making colostomy itself a reason for morbidity after penetrating colon injuries.[8,9]

Despite the above mentioned facts colonic anastamosis is not that much frequently practiced in our set up. By the results of this study we will be able to recommend primary anastamosis as a standard mode of treatment for colonic injuries. This will also help the specialist to know and compare the post-operative complications with psychological trauma associated with colostomy and primary anastamosis. The result of this study will be projected to the management and senior health professionals in the same filed to develop a scientific plan for the management of patients with penetrating colonic injuries.

**Material & Methods**:

This study was conducted at Surgical 'A' and 'B' Units Postgraduate Medical Institute, Lady Reading Hospital, Peshawar. Study design adopted was randomized control trial and the duration of the study was 6-months in which a total of 290 i.e. (145 in each group) were enrolled, keeping intra abdominal collection as 2.85% in anastamosis group versus 10% in colostomy group, using 5% level of significance and 80% power of test with the help of WHO formula for sample size determination.[7] Randomized blotting technique was adopted as the sampling technique used for all the patients following inclusion and exclusion criteria. All patients of any gender presenting with penetrating colonic injuries in age range of 18-60 years and presenting within 10-hours of the injury was included in the study. In addition patients with operative BP < 90 mmHg, requiring more than 4 units of blood, with major fecal contamination, and with more than two associated organ injury were excluded.

All patients with penetrating colonic injuries whether fire arm or stab wounds were admitted to the accidents and emergency department. Resuscitative measures were provided and after preliminary investigations, a written informed consent was taken from the patients or their near relative. Just before laparotomy, the patient was randomly allocated by lottery method into on the two groups. Group–A primary anastamosis and group–B colostomy, keeping in mind the exclusion criteria. Primary anastamosis were carried out using single layer extra mucosal interrupted technique with absorbable sutures vicryl 3/0. Colostomy stoma was made in group-B patients using vicryl 3/0 for anchoring the bowl to the skin surface. The patient's demographics, operative findings, procedure, hospital stay and post-operative complications like intra-abdominal abscess, wound infection and dehiscence was noted. The data was collected with the help of a proforma. The efficacy was measured in terms of intra abdominal collection by which collection of pus was observed inside the peritoneal cavity confirmed by ultrasound and surgical site infection, in which infection of the laparotomy incision ranging from erythema up to wound dehiscence was keenly observed.

At the completion of the study, data was be transferred to the computer and analyzed with the help of SPSS Version 20, where descriptive statistics were applied for categorical and numerical variables

**Results**:

The mean age of the whole sample 32±2.13 years, while the age distribution among two groups is based on table no:1. The gender distribution among two groups shows that the group-A (primary anastamosis) had 116(80%) patients as males and 29(20%) patients as females. Where as in group-B (colostomy) 123(85%)

patients were males and 22(15%) patients were females. Intra abdominal abscess among two groups were analyzed and it showed that group -A (primary anastamosis) had 7(5%) patients with Intra abdominal abscess while 138(95%) patients did not had any such abscess. Where as in group-B (colostomy) 22(15%) patients had Intra abdominal abscess while remaining 123(85%) patients were clear of Intra abdominal abscess. Wound infection among two groups was analyzed and in group-A (primary Anastamosis) 22(15%) patients had wound infection while 123(85%) patients were clear from wound infection. Where as in group-B (Colostomy) 58(40%) patients had wound infection while rest 87(60%) had no such infection. The efficacy in general between two groups was analyzed based on intra abdominal collection and it was shown that primary anastamosis was effective in 138(95%) patients while colostomy was effective in 123(85%) patients.

**Discussion**:

Abdominal trauma is the leading cause of mortality and morbidity during first four decades of life and is the third commonest reported cause of death overall. A study found that the frequency of intra abdominal abscess was 2.85 % in anastamosis group versus 10 % in colostomy group.[7] Wound infection was also less in the anastamosis group as compared to colostomy group. i.e. 14.28% versus 40%, showing effectiveness of primary anastomosis which is in similarity with this study. Colostomy is no longer the standard treatment option because of its own complications and the need for subsequent surgery.[6] even colostomy itself is a reason for morbidity after penetrating colon injuries.[7]

Penetrating injuries account for approximately 6% presentations in A&E dept worldwide. Penetrating injuries in our country are at rise due to increasing violence, interpersonal and communal clashes, robberies and increasing domestic violence since young males are more prone to firearm injuries, a similar trend was noticed in our study too.[10] The most commonly injured abdominal organ is reported to be colon worldwide.[11] The management of penetrating injuries to colon has long been debated. Traditionally they have been managed by primary colostomy, but management by primary repair has gained popularity in last 10-15 decades, it was although initially recommended for selected patient's only.[12] It was not recommended in cases with major blood loss, soiling, left sided colonic injuries, and injuries to more than two viscera in addition to colonic injuries.[13]

But research carried out lately across the globe, have concluded that primary repair of traumatic colonic injuries can be performed safely in almost all cases, even warfare injuries.[6,7,14] In a study conducted over a period of 2 decade on about 115-patients it was concluded that patients without planned ventral hernia (PVH), primary anastamosis was a better technique of management in which results demonstrated about 0% of complications in comparison with 36% complications caused due to colostomy.[12] It has been favoured over colostomy as it carries advantage of avoidance of colostomy, postoperative colostomy care and re-hospitalization and reoperation in terms of cost and morbidity. Furthermore it has been reported that right sided colonic injuries which require resections do very well after ilio-colic anastomosis.[15] But the management of left sided injuries is still debated, as most of injuries in our study are right sided and the outcome following primary repair is favourable. Single perforations in colon are routinely managed with primary closure, however multiple perforations requiring resection are recommended to be primarily anastomosed by an author, the only lesion requiring colostomy are rectal injuries or injuries involving pancreatico duodenal complex or major vessels with compromised blood supply or delay in surgery for more than 72 hours, or selected destructive injuries.[16]

The most common and questionable complication following primary repair is anostamotic leakage and subsequent mortality. In our study only 6% patients developed leakage, which are slightly lower than other studies, while postoperative wound infections are comparable with other studies.[17,18] Thus we recommend primary

repair in management of penetrating colonic injuries, except in cases of rectal injuries, major vessel injuries or injury to pancreaticoduodenal complex, or injury hospitalization interval of greater than 72 hours.[19]

**Conclusion**:
Primary anastamosis is safe and has excellent results as compare to defunctioning colostomy in the treatment of penetrating colonic injuries.

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**Role and contribution of authors**:
Dr. Shahidullah Ahmad, collected the data, references and did the initial writeup.

Dr. Kaleem Ullah, collected the data and helped in introduction writing.

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Dr. Aftab Hussain, collected the data and helped in introduction writing.

Dr. Muddasar Shahzad, collected the data, references and helped in discussion and result writing.

Dr. Viqar Aslam, critically review the article and made final changes.

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