

# Outcome of Primary Colonic Repair in Penetrating Abdominal Trauma

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Colon is quite frequently involved in penetrating abdominal trauma. A retrospective study of 45 patients who underwent primary repair of colonic injuries in the Mayo hospital emergency over a period of two and a half years is presented. The colonic repair or resection and anastomosis was done in single or double layer of interrupted sutures. Left colon (11%) was the most frequently injured site, followed by ascending colon (9%) and transverse colon (9%). Primary repair of perforations 17 (%) was the commonest procedure performed followed by right hemicolectomy 15 (%). Bullet tract infection was the major complication encountered 5(%) followed by laparotomy wound infection 3(%) and anastomotic leak 3(%). Primary repair can be done in more cases than it is routinely done. Gross faecal contamination extensive colonic damage and type of faeces in affected colon should be considered as indication favouring colostomy.

**Key Words:** Colon repair, primary, colostomy.

Intra abdominal penetrating injuries is one of the common emergencies in Pakistan. Colon is quite frequently involved in these injuries. Traditional teaching and surgery recommended exteriorization of these injuries in the form of colostomy as the safest procedure.

With the advent of antibiotics and improvement in the technique of colonic surgery, primary repair of colonic injuries has gained importance as a reliable alternative to colostomy. This has happened because of the complications associated with colostomy and its subsequent reversal<sup>1</sup>. This is specially true of Hartman's procedure. Primary repair saves the patient from an additional laparotomy if not an additional procedure altogether.

Most of the patients with intra abdominal penetrating injuries are young and otherwise healthy. Colonic injury under the circumstances can be repaired primarily.

## Materials and Methods:

This is a retrospective study of 45 patients coming to Mayo Hospital emergency from October 95 to March 98 with penetrating injuries to colon. The patients who had primary colonic repair are included in this study.

It includes patients who had right hemicolectomy for injuries to right colon, primary repair of the injury, resection and anastomosis for colonic injuries and proximal defunctioning loop colostomies after distal repair or resection and anastomosis. The ileocolic anastomosis was done in two layers (inner continuous with vicryl and outer interrupted with 3/0 prolene or vicryl). The colonic repair or resection and anastomosis was done in single or double layer of interrupted sutures of vicryl 2/0 or prolene 3/0.

Proximal defunctioning was done in cases with associated injuries to two or more viscera. patient presenting in hospital more than 12 hours after injury. faecal contamination of peritoneum with more than 20 ml of faeces. The patients who had exteriorization of injuries as loop colostomies or hartman's procedure are not

included in this study.

The data collected includes age, sex, time of arrival in casualty, blood pressure, pulse, number of transfusions required, mode of injury, site of colonic injuries, associated injuries and post operative complications.

## Results:

During the last 30 months i.e. from October 95 to March 98 total no of 45 cases were received in the emergency of North surgical ward Mayo Hospital Lahore for which some sort of colonic repair was done for penetrating abdominal trauma. The age and sex distribution is shown in table no I and II respectively.

Table No 1. No. of cases

Total	45
Male	39
Female	06

Table No 2. Age groups

17-40 years	43
40-60 years	03

The time of arrival in Mayo Hospital emergency depended upon whether the patient was brought directly to the Accident and Emergency department of Mayo Hospital or they were referred from peripheral centres at district or basic health unit level. Table no III.

Table No 3. Time of arrival in casualty

0-6 hours	12
6-12 hours	14
12-24 hours	17
36 hours	01
72 hours	01

The pulse, blood pressure and number of transfusions required are shown in Table no IV, V, and VI respectively. Descending colon was the most frequently injured site followed by ascending colon and transverse colon. The distribution of colonic injuries regarding sites is shown in Table VII.

## Primary Colonic Repair

**Table No 4.** Pulse on arrival

>140	06
120-140	23
100-120	10
80-100	06

**Table No 5.** Systolic Blood Pressure on arrival

>80	26
80-100	15
100-120	04

**Table No 6.** Blood transfusions required

>6	20
-6	20
-4	05

**Table No 7.** Sites of colon

Caecum	04
Ascending colon	09
Hepatic flexure	04
Transverse	09
Splenic flexure	04
Descending colon	11
Sigmoid	04

The high number of associated injuries encountered was due to the reason that most of these injuries were due to the fire arm. The associated injuries are shown in Table No. VIII. Primary repair of perforation was the commonest procedure performed followed by right hemicolectomy as shown in table no IX.

**Table No 8.** Associated injuries

Small bowel	15
Duodenum	05
Diaphragm	04
Kidney	04
Chest	03
Stomach	03
Liver	02
Spleen	01
Bladder	02
Limbs*	03

\*Fractures and soft tissue

**Table No 9.** Type of repair

Primary closure	24
End to end anastomosis	04
Perforation repair	17
Seromuscular tear	03
Primary end to end anastomosis with proximal defunctioning loop colostomy	06
Hemicolectomy	15

Bullet tract infection was the major complication encountered (5/45) followed by laparotomy wound infection (3/45) and anastomotic leak (3/45). All the patients with anastomotic leak were identified early, exteriorized and repaired subsequently.

### Discussion

Colon is second only to the small bowel in frequency of abdominal organs injured in gun shot injuries and third (after liver, small bowel) in abdominal stab wounds. In most contemporary series the infectious morbidity is 25 -

35 % and mortality is 3 -12%. because of the concern about the infection after primary repairs it has long been believed that the safest practice is to divert the faecal stream and reverse the colostomy later<sup>2</sup>.

However the need for uniform colostomy in civilian colon trauma has been challenged the reason being that unlike war injuries civilian colonic wounds are due to low velocity hand guns or stabbing<sup>3,4,5</sup>. As a consequence may trauma surgeons now believe that more than half of all colonic injuries can be treated by primary repair instead of colostomy or exteriorisation. This change in practice has been demonstrated by Nance documenting increasing incidence of primary repair vs colostomy for colonic wounds during the past two decades<sup>6</sup>.

While controversy exists between proponents of primary repair and colostomy no one suggests that all colonic injuries need be managed by the same method<sup>7</sup>. At present four techniques have a place.

- Primary repair
- resection and primary anastomosis with or without proximal defunctioning colostomy.
- Repair and exteriorization.
- Colostomy

However several reports indicate 50% failure rate with the technique of exteriorization with repair<sup>8</sup>.

General guidelines that must be met to consider primary repair of colon include operation within 4-12 hours of injury, less than 6 units of blood transfusion, no evidence of prolonged shock, minimal soilage of peritoneal cavity, no associated major injuries to vasculature of colon, no loss of abdominal wall or need for synthetic mesh repair<sup>9</sup>.

With these selection criteria primary repair of either right or left colon can be accomplished with minimal morbidity and mortality.

Our results are highly encouraging and we believe that primary colonic repair can be safely done with minimal morbidity in our circumstances<sup>10</sup>.

### Conclusion.

1. Small stab wounds are low velocity gun shot wounds to right colon may under go primary repair.
2. More significant penetrating injuries to right colon are managed by right colectomy in ileotransverse anastomosis.
3. Similar recommendations are made for injuries of transverse and left colon.
4. Some injuries of transverse or left colon can be accompanied by proximal defunctioning colostomy with distal repair or anastomosis.
5. The need for a second major laparotomy can be avoided with primary repair of colon.

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