

Outcome of Primary Repair in Traumatic Colonic Injuries

ZULFIQAR ALI SHAHID¹, MUHAMMAD AFZAL SAJID², HUMARA GUL³

ABSTRACT

Aim: To determine the frequency of outcome of primary repair in traumatic colonic injuries.

Methods: This case series study was conducted at Department of Surgery, Nishtar Hospital, Multan from February 2015 to August 2015. Total 80 patients of who underwent exploratory laparotomy for abdominal trauma and colon injury either male or female having age from 20-60 years were selected

Results: Mean age of the patients in our study was 34.99±14.65 years. Leakage was present in 4(5%) cases and absence of leakage was noted in 76(95%) cases.

Male cases were 52(65%) and female cases were 28(35%). Absence of leakage was noted in 50(96.15%) male cases and 26(92.86%) cases. But not relation of gender with absence of leakage was noted with p value 0.920. Cases with gunshot abdomen, stab abdomen and blunt trauma abdomen were 41(51.25%), 25(31.25%) and 14(17.5%) respectively

Conclusion: Our study suggests that Primary repair of the trauma colon is the treatment of choice in low risk patients. However, there is need to assess the results of one stage management on large scale in moderate to high risk patients with traumatic colonic injuries.

Keywords: Colon injury, colon trauma, primary repair, anastomosis leakage.

INTRODUCTION

Trauma is the leading cause of death and disability in the world to date¹. Injuries of the hollow viscera are far less common in blunt abdominal trauma than in penetrating abdominal trauma and blunt abdominal trauma accounts for approximately 5% to 15% of all operative abdominal injuries^{2,3}. Abdominal trauma contributes to a significant number of deaths and the major patterns include Gunshot wounds, stab wounds and the blunt trauma of the abdomen. Although the colon is often injured in penetrating abdominal trauma, a significant proportion of colonic injuries caused by the road traffic accidents is a grossly destructive blunt type associated with damage to multiple organs^{2,4,5}. The colon is injured in 25% of Gunshot wounds, 5% of stab wounds and 2% to 5% of blunt injuries⁶. Colon injury has been associated with a high risk of septic complications and mortality⁷.

The optimal management of destructive colonic injuries requiring resection remains controversial⁸. Failure to treat penetrating colon wounds with colostomy could result in court martial of military surgeons in East African front in command of Consultant Surgeon General and colostomy for civilian colon wounds became the standard of care for next 4 decades based on this wartime experience⁸.

The management of traumatic colonic injuries has changed significantly from "faecal diversion

dogma" to primary repair^{2,5}. Recent studies from USA and South Africa do not support the routine use of colostomy for most traumatic colonic injuries⁹. One stage management at the time of initial exploration is most often used for the traumatic colonic injuries¹⁰. A more liberal use of primary repair is required in patients with traumatic colonic injuries⁷. The emerging dictum for traumatic colonic injuries is primary repair¹¹. Some workers have advocated that primary repairs in traumatic colonic injuries have acceptable results irrespective of the risk factors¹². Questions remain as to whether primary repair is the safest option for all grades of colon injuries and all degrees of faecal contamination¹¹. Since the colostomy is a social & religious embarrassment, economical burden and psychological trauma for the patients, further investigation is needed to determine if primary repair/ resection & anastomosis is safe in our settings & to assess the burden of complications¹³.

So, our study will discuss the role of primary repair of colon in term of anastomosis leakage/ primary repair failure in colonic trauma patients so that future management can be planned in the light of these results.

MATERIAL AND METHODS

This case series study was conducted at Department of Surgery, Nishtar Hospital, Multan from February 2015 to August 2015. Total 80 patients of who underwent exploratory laparotomy for abdominal trauma and colon injury either male or female having age from 20-60 years were selected. Patients having associated diseases like diabetes mellitus, Chronic

¹Assistant Professor Surgery, Nishtar Medical College Multan

²Emergency Surgeon, Nishtar Hospital Multan

³Assistant Professor Anatomy, Multan Medical & Dental College

Correspondence to Dr. Zulfiqar Ali Shahid, Email:

drzulfiqarali56@gmail.com

liver disease, hypertension, patients who sustained associated >2 organ injuries, patients who presented with shock on admission, patients who presented >8 hours after trauma and required >8 pints of blood transfusion were excluded from the study.

Traumatic colonic Injury was labeled as the injury of colon found per-operatively in patients who present to the emergency department after Gunshot abdomen, Stab abdomen, blunt trauma abdomen or road traffic accidents. An approval was taken from institution review committee and written informed consent was taken from every patient.

After surgery age, gender, site of injury, mode of injury & grade of colonic injury was entered in pre-designed proforma at 6 day of surgery and all the patients were evaluated for absence of anastomotic leakage/ repair failure. Absence of Anastomotic Leakage/ Repair Failure: was labeled as pulse rate <100/min, systolic B.P >90 mmHg, clinically non-tender, non-distended abdomen, passing faeces/ flatus and confirmed by USG & CT Scan on 6th post-operative day.

All the collected was entered in SPSS version 16 and analyzed. Mean and SD was calculated for age and frequencies were calculated for gender, mode of injury, site of injury, grade of injury and absence of anastomotic leakage/ repair failure. Grade of injury, mode and site of injury were stratified for control of confounding. P value ≤ 0.05 was considered as significant.

RESULTS

Mean age of the patients in our study was 34.99 ± 14.65 years. Leakage was present in 4 (5%) cases and absence of leakage was noted in 76 (95%) cases. (Fig. 1)

Male cases were 52 (65%) and female cases were 28 (35%). Absence of leakage was noted in 50 (96.15%) male cases and 26 (92.86%) cases. But not relation of gender with absence of leakage was noted with p value 0.920 (Table 1).

Cases with gunshot abdomen, stab abdomen and blunt trauma abdomen were 41(51.25%), 25(31.25%) and 14(17.5%) respectively. Absence of leakage was noted in 37 (90.24%) cases of gunshot abdomen and no leakage was noted in cases of stab abdomen and blunt trauma abdomen. No association ($P=0.1347$) of mechanism of injury with absence of leakage was noted (Table 2).

There was no leakage 42 (100) present in repair of transverse colon injuries but Leakage was noted in 2 (10.53%) cases of sigmoid injury and 1 case of Ascending & Descending colon injury each. Insignificant ($P = 0.1976$) association of site of injury with absence of leakage was noted (Table 3).

Grade I colon injury was noted in 15(18.75%) cases while Grade II colon injury was present in 51(63.75%) cases and Grade-III colon injury was noted in 14(17.5%) cases. Absence of leakage was noted in 15(100%) cases of Grade-I colon injury and 50(98.04%) cases of Grade-II injury and 11(78.57%) cases of Grade-III injury. Statistically significant ($P=0.008$) association of grade of injury with absence of leakage was noted. (Table 4)

Fig. 1: Frequency of absence of Absence of leakage

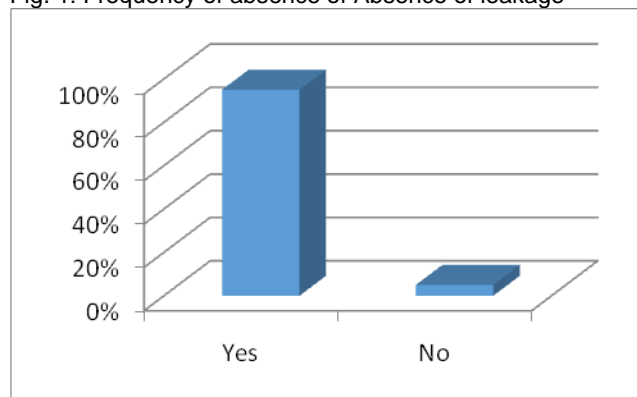


Table 1: Absence of leakage in relation to gender

Gender	Absence of leakage		Total
	Yes	No	
Male	50(96.15%)	2(3.85%)	52(65%)
Female	26(92.86%)	2(7.14%)	28(35%)

P value: 0.920

Table 2: Absence of leakage in relation to mechanism of injury

Mechanism of injury	Absence of leakage		Total
	Yes	No	
Gunshot abdomen	37(90.24%)	4(9.76%)	41(51.25%)
Stab abdomen	25(100%)	0	25(31.25%)
Blunt trauma abdomen	14(100%)	0	14(17.5%)

P value: 0.1347

Table 3: Absence of leakage in relation to site of injury

Site of injury	Absence of leakage		Total
	Yes	No	
Transverse	42(100%)	0	42(52.5%)
Sigmoid	17(89.47%)	2(10.53%)	19(23.75%)
Descending	8(88.89%)	1(11.11%)	9(11.25%)

P value 0.1976

Table 4: Absence of leakage in relation to grade of injury

Grade of injury	Absence of leakage		Total
	Yes	No	
I	15(100%)	0	15(18.75%)
II	50(98.04%)	1(1.96%)	51(63.75%)
III	11(78.57%)	3(21.43%)	14(17.5%)

DISCUSSION

Injury of the colon sustained in Gunshot abdomen, Stab abdomen and Blunt trauma abdomen as in road traffic accidents is called Traumatic colonic injury. It is a well-known surgical emergency^{1,2,3}. There were 80 patients in our study who were selected as per criteria. Mean age of the patients was 34.99 ± 14.65 years. Israr M et al¹² reported mean age as 21 years which was not comparable with our study.

In our study among 80 patients, 65% were males and 35% were females. So, male to female ratio was 1.85:1. Male to female ratio was 4:1 in study Israr M et al¹² which also shows that the incidence of colon trauma is more in males as compared to female.

In another study¹⁴, the majority of patients were males and major cause of colon injury was firearm followed by stab and blunt trauma to abdomen. The major cause of injury to colon in our study was also Gunshot abdomen 51.2% followed by Stab abdomen 31.2% and Blunt trauma abdomen 17.5%. The mechanism of injury and gender of the patients was almost similar as in this study.

The most common site of injury in our study was transverse colon 52.5% followed by sigmoid colon 23.8%, ascending colon 12.5% and descending colon 11.3%. Most of the injuries were of transverse colon in a National study¹⁵. Transverse colon was noted to be most commonly injured in an international study by Kairaluoma MI et al¹⁶. Colonic injuries were sustained by 102 patients in a study by Clarke DL et al¹⁷ and the transverse colon was injured most frequently (51.9%). The incidence of transverse colon injury in our study was very similar to these studies.

Grade I injury of colon was present in 18.8% patients in our study while 63.8% patients presented with Grade II injury and 17.5% patients presented with Grade III injury of colon. In study by Sasaki LS et al¹⁸ the majority of injuries as assessed by the Colon Injury Score (CIS) for the primary repair group were grades II (58%) and III (28%).

Absence of anastomotic leakage/ repair failure was seen in 95% patients in our study. In one study, it was reported that there was no anastomotic leakage⁹. Chappuis CW et al¹⁹ also reported that there were no episodes of suture line failure in the primary repair/anastomosis. Out of 95 patients repaired primarily by George SM Jr et al²⁰, there were no suture line failures in the primary repair group, and one suture line failure in the anastomosis group. The one failure was in a patient who underwent repeated explorations for bleeding before the leak occurred. A clinical anastomotic leak rate of 7.2% was observed by Mealy K et al²¹. In one study by Khan et al, leakage was noted in 15% patients after colon repair²².

CONCLUSION

Our study suggests that Primary repair of the trauma colon is the treatment of choice in low risk patients. However there is need to assess the results of one stage management on large scale in moderate to high risk patients with traumatic colonic injuries.

REFERENCES

1. Steele SE. When trauma means a stoma. *Wound Ostomy Continence Nurs* 2006;33(5):491-500.
2. Cleary RK, Pomerantz RA, Lampman RM. Colon and rectal Injuries. *Dis Colon Rectum* 2006;49:1203-22.
3. Ricciardi R, Paterson CA, Islam S, Sweeney WB, Baker SP, Counihan TC. Independent predictors of morbidity and mortality in blunt colon trauma. *Am Surg* 2004;70:75-9.
4. Tzovaras G, Hatzitheofilou C. New trends in the management of colonic trauma. *Injury* 2005;36:1011-5.
5. Bowley DM, Boffard KD, Goosen J, Bebington BD, Plan F. Evolving concepts in the management of colonic injury. *Injury* 2001;32:435-9.
6. Peitzman AB, Rhodes M, Schwab CW. *The Trauma Manual*. 3rd ed. Lippincott Williams & Wilkins; 2007:254.
7. Adesanya AA, Ekanem EE. A 10 year study of penetrating injuries of the colon. *Dis Colon Rectum*. 2004 Dec;47(12):2169-77.
8. Miller PR, Fabian TC, Croce MA, Magnotti LJ et al. Improving outcomes following penetrating colon wounds: application of clinical pathway. *Ann Surg*. 2002 Jun;235(6): 775-81.
9. Steel M, Danne P, Jones I. Colon trauma: Royal Melbourne Hospital experience. *ANZ Surg* 2002 May;72(5):357-9.
10. Zheng YX, Chen L, Tao SF, Song P, Xu SM. Diagnosis and management of colonic injuries following blunt trauma. *World J Gastroenterol* 2007;13(4):633-6.
11. Fleak M, Osipov R, Foster K, Caruso D. The conundrum of traumatic colonic injury. *Am J Surg* 2004 Dec; 188(6): 663-70.
12. Israr M, Jan WA, Ismail M, Zada N. Primary closure of traumatic colonic injuries. *Postgrad Med Inst* 2002 Jan;16(1):108-12.
13. Conard JK, Ferry KM, Foreman ML, Gogel BM, Fisher TL, Livingston SA. Changing Management trends in penetrating colon trauma. *Dis Colon Rectum* 2000 Apr;43(4):466-71.
14. Khan FM, Ayyaz M, Sharif M. Management of Colonic Trauma: An experience at Mayo Hospital, Lahore. *Ann King Edward Med Coll Oct - Dec* 2003;9(4):303-4.
15. Haq A, Mumtaz F, Wahla MZ. Primary repair vs colostomy in colonic injuries - a two year experience at Lahore General Hospital and Mayo Hospital, Lahore. *Ann King Edward Med Coll Jan - Mar* 2006;12(1):95-8.
16. Kairaluoma MI, Orava S, Huttunen R, Mokka R, Tuononen S, Ala-Ketola L et al. Management of injuries of the large intestine. *Ann Chir Gynaecol* 1977;66(3):160-3.
17. Clarke DL, Thomson SR, Muckart DJ, Neijenhuis PA. Universal primary colonic repair in the firearm era. *Ann R Coll Surg Engl* 1999 Jan;81(1):58-61.
18. Sasaki LS, Allaben RD, Golwala R, Mittal VK. Primary repair of colon injuries: a prospective randomized study. *J Trauma* 1995 Nov;39(5):811-2.
19. Chappuis CW, Frey DJ, Dietzen CD, Panetta TP, Buechter KJ, Cohn I Jr. Management of penetrating colon injuries. A prospective randomized trial. *Ann Surg* 1991 May;213(5):492.
20. George SM Jr, Fabian TC, Voeller GR, Kudsk KA, Mangiante EC, Britt LG. Primary repair of colon wounds. A prospective trial in nonselected patients. *Ann Surg* 1990 Jul;212(1):118.
21. Mealy K, Salman A, Arthur G. Definitive one-stage emergency large bowel surgery. *Br J Surg* 1988;75(12):1216.
22. Khan SA, Ahmad I, Ahmed E. Primary Repair of Colonic Injuries. *PJMHS*. 2014;8(1):179-81.

