

EXPERIENCE WITH SPLENIC TRAUMA IN AYUB TEACHING HOSPITAL, ABBOTTABAD

Tariq Saeed Mufti, Ismail Akbar, Sajjad Ahmed

Department of Surgery, Ayub Teaching Hospital, Abbottabad

Background: This study was carried out to estimate the prevalence, severity and mode of splenic trauma and management technique from amongst the abdominal trauma cases admitted in Ayub Teaching Hospital. **Methods:** The study was carried out at Surgery units of Ayub Teaching Hospital, Abbottabad, the only referral hospital for major trauma cases, from July 2001 to Dec. 2002. One hundred consecutive abdominal trauma patients admitted to all surgical units which were followed up through complete documentation were included in the study. Their injuries were classified, treatment strategies outlined and complications were documented. **Results:** Out of the 100 patients presenting in emergency, 25% presented with blunt and 75% with penetrating trauma. 97 patients underwent laparotomy and 03 treated conservatively. Mean age was 27.26 (range 19-49) years. Out of these cases 19 patients had splenic injury, 6 (31.57%) with Type-I & II while 13 (68.42%) with Type-III & IV. 11(57.89%) of the splenic injuries were due to blunt abdominal trauma and 8 (42.10%) due to penetrating abdominal injuries. 14 (83.6%) of the patients with splenic injury underwent splenectomy and 5(26.3%) splenorrhaphy. **Conclusion:** The commonest cause of splenic injury was blunt abdominal trauma; Assessment of the severity of splenic injuries at the time of laparotomy resulted in splenic salvage procedures in some cases. Splenorrhaphy was associated with fewer complications.

Keywords: Spleen; Trauma; Splenic Salvage

INTRODUCTION

Although protected under the bony ribcage, the spleen remains amongst the vulnerable organ sustaining injury from amongst the abdominal trauma cases in all age groups.

It is a friable and highly vascular organ holding 25% of the body's lymphoid tissue and has both haematological and immunological functions.^{1,2} The ancients used to remove the spleen from athletes to improve their wind.³ The first total splenectomy for disease is attributed to Adriano Zacarillo in 1549.^{1,2,4} Nicolas Mathias is mentioned to do the first total splenectomy for trauma in 1678 and the patient reported to have survived for at least 6 years.^{1,5}

In civilian community practice frequency of splenic rupture due to blunt trauma far exceeds than that of penetrating trauma. Road traffic accidents, steering wheel injuries and seat belt are the common implicating causes.^{5,6} Penetrating injuries of the left thorax should arouse suspicion of splenic injury. In such cases the frequency of associated intra-abdominal injuries is high.⁷ The splenic salvage operations and non operative treatment for splenic injuries have increasingly been practiced recently.

The objective of this study was to estimate the prevalence, severity and mode of splenic trauma and management technique used from amongst the abdominal trauma admitted in Ayub Teaching Hospital, Abbottabad.

MATERIAL AND METHODS

This study period was from July 2001 to December 2002 at Department of Surgery, Ayub Teaching

Hospital, Abbottabad, which has three surgical units each containing 50 beds. One hundred consecutive patients admitted with abdominal trauma were included in this study. A pre-designed proforma was filled for all the identified information on patient in the study.

All patients were received through casualty department where they were assessed and received initial management if their condition was haemodynamically unstable. Routine Investigations included hematological (hemoglobin, Total Leucocyte count, blood grouping & platelet count), biochemical (urea, sugar, serum electrolytes) and radiological (X-ray chest & abdomen) while abdominal ultrasound and CT scan was done on request of the admitting surgical team and subject to their availability. In some cases where specialized radiological investigation could not be carried out diagnostic peritoneal lavage was carried out. The patients were assessed for a decision to conduct laparotomy.

All the patients were given antibiotic cover. At laparotomy the splenic injury encountered was assessed for the extent of injury according to the standard grading system for splenic injury.⁴ Cases where splenic salvage was feasible the following strategy was adopted. For Grade I tear, Spongostone gelatin sponge was applied with or without suture on the surface of the wound as a haemostatic agent, for Grade II and III tears deep mattress sutures with chromic 0 or 1 were applied over omentum patch to provide buttress to the splenic tissue. For grade IV and V injury the organ was assessed for splenectomy.

Other injuries were also searched and dealt with accordingly. The patients were discharged with post-splenectomy instructions. The data was collected and analyzed by SPSS 10 version of the statistic software.

RESULTS

100 abdominal trauma patients were followed up in this study. Eighty four patients were male and 16 females (5.5:1). Mean age of abdominal injury cases was 27.26 years (range 19 – 55 years). Out of these 97 patients underwent exploratory laparotomy while 3(03%) were treated conservatively. 74 cases were due to penetrating injury while 25% sustained blunt injuries. 10 cases out of blunt trauma (40%) due to falls from heights and 9 (36%) due to road traffic accidents. Splenic injury was noted in 19 (19%) patients. Amongst splenic injuries 12 (63.15%) were males and 7 (36.85%) females. Frequency of type of injuries is given in Table 1.

Table 1. Frequency of Injuries amongst Abdominal Trauma

Type of Injury	Over all frequency	Splenic Injury
Penetrating Injury		
Firearm	55 (55%)	06(6%)
Stab wound	19 (19%)	02 (2%)
Blunt Trauma	25 (25%)	11(11%)
Blast	1(%)	-

Table 2. Comparative mode of injury in cases operated for splenic injury

Mode of Injury	Splenectomy cases	Splenorrhaphy cases	Total
Blunt abdominal injury	09	02	11 (5.8%)
Penetrating Injury	05	03	08 (4.2%)

Figure 1: Type of Splenic Injury

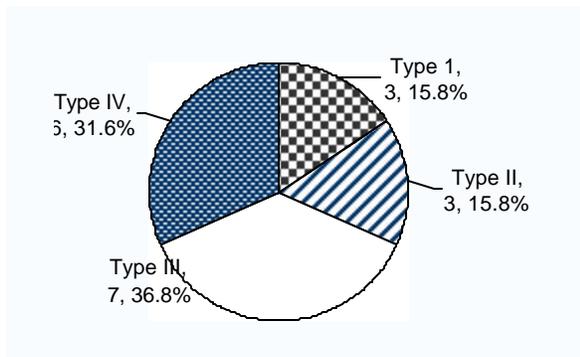


Table 2 presents the mode of injury in splenic trauma cases. Splenectomy was carried out in 14 patients, 13 for type III & IV and 1 for type II

injury. In 5 (26.31%) patients splenorrhaphy was performed for type I, II & III injuries (Figure 1).

Comparative post operative complications are given in Table 3.

Table 3. Comparison of post operative complications between Splenectomies and splenorrhaphies

Complications	Splenectomy	Splenorrhaphy
Intra abdominal bleed/ collection	02 (14.3%)	Nil
High grade fever	02 (14.3%)	01 (20%)
Wound sepsis (Gross)	03(21.4%)	Nil
Entero- cutaneous fistula	01(7.1%)	Nil
Total	08 (57.8%)	01(20%)

The complications were markedly high in splenectomy cases. Table 4 details the evaluation of treatment in splenorrhaphy cases.

Table 4. Evaluation of Splenic salvage techniques

Salvage procedure on spleen	Severity Type of injury	No.of cases	Outcome
Simple repair with suture	I	1 (20%)	Uneventful recovery
Repair with sutures over spongiston	II	1 (20%)	Uneventful recovery
Repair with sutures over omental patch	III	2 (40%)	One patient developed intra-abdominal infected collection
Partial splenectomy and omental patch	IV	1 (20%)	Uneventful recovery

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.⁸

Same observations are noted in the present study where the mean age of patients with abdominal trauma was 27.26 years. Ahmad noted 50% of patients in his study belonging to age group of 12 - 40 years.⁹

In the present study out of hundred patients the male to female ratio was 5.5:1. while the ratio of splenic injury in male to female was 1.7:1. Qureshi et al noted a male to female ratio of 9:1⁵.

Almost similar observations were made by Memon et al,⁴ Zafar et al,¹⁰ Ahmad⁹ and Khan⁷.

Blunt trauma is the second commonest mode of abdominal trauma and spleen is the most common intra-abdominal organ injured in blunt abdominal trauma.^{1,11-14} Ayub also concluded that blunt abdominal trauma is a common emergency.⁶

In the present study blunt abdominal trauma accounted for 25%. A total of 19 patients (19%) were noted with splenic injury and the most common cause of splenic injury was blunt abdominal trauma i.e 57.89%. Most of the blunt abdominal traumas were secondary to falls from heights (40%) and road traffic accidents (36%). These results are also comparable with those of Arikan,¹⁵ Manohar¹⁶ and Powell.¹⁷

In the present study type III splenic injury was most frequent i.e 7 patients (36.84%), type IV accounted for 6 patients (31.57%). Type I & II injuries were noticed for 3 patients (15.78%). Almost similar results were observed by Wasvary¹⁸ and Goan¹⁹ where type III was documented as the most frequent one. Carlin²⁰ concluded that the need for splenectomy was most significantly correlated with higher grades of splenic injury i.e Grade IV. Javed⁵, Rathore²¹ and Zafar¹⁰ did not attempt splenorrhaphy even in a single patient due to extensive injuries. While Memon⁴ and Kamel³ stressed upon splenic conservation in stable patients. This study attempts to follow their guidelines to some extent.

In recent years the policy of spleen's conservation at operation has been established due to its important role in cellular and humoral immunity and the danger of overwhelming sepsis in asplenic patients.^{3, 4, 12} Consequently operative techniques for splenic preservation have been developed and concept for non-operative management of selected splenic injuries is evolving.²²⁻²⁵

CONCLUSION

In this study the commonest cause of splenic injury was blunt abdominal trauma and most of the splenic injuries were Grade III & IV. Splenectomy was performed in majority of the cases. Results of splenorrhaphy were encouraging. Splenorrhaphy should be considered in all the splenic injury cases at the time of laparotomy..

REFERENCES

1. Cooper MJ, Williamson RCN. Splenectomy: indications hazards and alternatives. Br J Surg 1984;71:173-80.
2. Muhammad G, Ahmad S. Splenectomy indications hazards and alternatives. J Ayub Med Coll Abbottabad 1988;1:34-9.
3. Kamel R, Manar ET, Kamel RR. Surgery of the spleen: splenic conservation. J Surg Pakistan. 2000;5:20-8.

4. Memon AA, Ansari AG, Memon AQ. Indications for splenectomy and changing concepts. J Surg Pakistan 2000;5:7-9.
5. Javed NQ, Zahid AQ, Parkash A, Abdul SM. Gunshot perforation of gut and associated injuries. J Surg Pakistan 2001;6:21-3.
6. Ayub H. Assessment of blunt abdominal trauma. J Ayub Med Coll Abbottabad 1997; 9:27-8.
7. Khan A. Stab wounds abdomen: An experience with 105 laparotomies. J Ayub Med Coll Abbottabad 1999;11:6-8.
8. Russel RCG. The spleen. In: Russel RCG, Williams NS, Bulstrode JK eds. Bailey & Love short practice of surgery. 24th ed. London: Arnold, 2004:1084-93
9. Ahmad I. Abdominal trauma. A prospective study. Pak J Surg 1992;8:37-42.
10. Zafar A, Chohan K, Faheem A, Zaheera M, Riaz A. abdominal trauma in DHQ hospital Rawalpindi. Rawalpindi Med J 1988;17:79-81.
11. Booth WCM, Cooper MJ. Surgical management of the spleen. Surgery (quarterly edition) 1997;38:148-51.
12. David CS, Lyrely HK. Sabiston Surgery, 15th ed. WB Saunders, Philadelphia 1997: 1187-1213.
13. Gosh S, Symes JM, Walsh TN. Splenic repair for trauma. Br J Surg 1988; 75: 1139-40.
14. Targarona EM, Trias M. Laparoscopic treatment of splenic injuries. Semin Laparosc Surg. 1996;3:44-9.
15. Arikan S, Yucel AF, Adas G, Culcu D, Gulen M, Arinc O. Splenic trauma and treatments. Haseki Educationl and Research Hospital Surgical department survey of the feasibility of surgery for splenic trauma. Ulus Trauma Derg 2001;7:250-3.
16. Manohar NN, Rao RI, Irene W, Micael R, William MS. Non-operative management versus early operation for blunt splenic trauma in adults. Surg Gynecol Obstet 1998; 166:252-7.
17. Powell M, Courcoulas A, Gardner M, Lynch J, Harbrecht BG, Udekwo AO, et al. Management of blunt splenic trauma: Significant differences between adults and children. Surgery 1997;122:654-60.
18. Wasvary H, Howells G, Villalba M, Madrazo B, Bendick P, DeAngelis M, et al. Non-operative management of adult blunt splenic trauma: a 15 year experience. Am Surg 1997; 63: 694-9.
19. Goan YG, Huang MS, Lin JM. Non-operative management for extensive hepatic and splenic injuries with significant haemoperitoneum in adults. J Trauma. 1998; 45: 360-4.
20. Carlin AM, Tyburski JG, Wilson RF, Steffes C. Factors affecting the outcome of patients with splenic trauma. Am Surg 2002;68:232-9.
21. Rathore AH. Penetrating abdominal injuries. Pakistan J Surg 1986;1:181-5.
22. Peter M. changing attitudes towards the management of blunt splenic trauma in adults. Surg Gynecol & Obstet. 1988;166: 84.
23. Bond SJ, Eichelberger MR, Gotschall CS, Sivitt CJ, Randolph JG. Non-operative management of blunt hepatic and splenic injury in children. Ann Surg 1996;223:286-9.
24. Gaunt WT, McCarthy MC, Lambert CS, Anderson GL, Barney LM, Dunn MM, et al. Traditional criteria for observation of splenic trauma should be challenged. Am Surg 1999; 65: 689-91.
25. Barone JE, Burns G, Svehlak SA, Tucker JB, Bell T, Korwin S, et al. Management of splenic trauma in patients older than 55 years. Southern Connecticut Regional Trauma Quality Assurance Committee. J Trauma 1999; 46: 87-90.

Address For Correspondence: Dr. Ismail Akbar, Surgical "A" unit, Ayub Teaching Hospital, Abbottabad
Email: drismailakbar@yahoo.com