

Original Research Article

Study of the spectrum of splenic trauma in tertiary care centre in GMC Jammu

Raheel Hussan Naqvi, Gurbir Singh, Adeel Ahmed Malik*, Amit Kumar, Rahual Kumar

Department of Surgery, Government Medical College, Jammu and Kashmir, India

Received: 11 October 2022

Revised: 07 November 2022

Accepted: 11 November 2022

***Correspondence:**

Dr. Adeel Ahmed Malik,

E-mail: adeel.malik0007@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: the aim of the study was to study the clinical presentations, modes of management and outcome in a patient with splenic trauma. Setting and design of study retrospective observational study conducted in a tertiary care hospital in GMC Jammu.

Methods: The study was done in the department of general surgery in a tertiary care centre that has round the clock availability of all radiological investigations. A total 50 cases of splenic trauma diagnosed by focussed abdominal sonography in trauma (FAST) or CT scan or per operatively were enrolled in the study.

Results: Maximum number (36%) of patients were aged between 31-40 years of age. Most of the patients (92%) presented with blunt abdominal trauma. RTA (40%) and fall (40%) were the common causes of blunt abdominal trauma. Maximum patients (36%) had grade III splenic injury. 30% of the patients managed by NOM while 70% underwent splenectomy.

Conclusions: Patients with splenic injury (grade I-grade III) can be managed by NOM without increased morbidity and mortality through proper monitoring.

Keywords: Splenic trauma, FAST, CT scan, NOM, Splenectomy

INTRODUCTION

The spleen is the most commonly injured abdominal organ in the national trauma data bank (NTDB). Many splenic injuries are self-limiting, demonstrating no evidence of bleeding; others require splenectomy, which in most cases is straightforward. Despite this, the mortality after blunt splenic injury in the NTDB is 9.3%. Many of these deaths are likely caused by associated injuries and prehospital delays.¹ Direct compression of the spleen with parenchymal fracture is a common pathophysiologic mechanism at the tissue level, although injury can also be secondary to rapid deceleration that tears the splenic parenchyma or capsule where it is fixed to the retroperitoneum. Haemorrhage from splenic injury can be ongoing at the time of presentation or more

commonly have stopped, causing no more blood loss. Injuries that stop bleeding can often be managed without splenectomy, although patients can experience re-initiation of haemorrhage. Penetrating splenic trauma is less common but is still present in 8.5% of all penetrating abdominal injuries in the NTDB.² Unstable patients who are taken emergently to operating room may have a splenic injury identified at the time of laparotomy. Unstable patients with intra-abdominal fluid on FAST require exploration, with the spleen commonly being the bleeding intra-abdominal organ. In all other patients, abdominal CT with IV administration of a contrast agent is the most valuable study for identifying and characterizing splenic injuries. Spleen injuries are characterized by the AAST Injury Scoring Scale, which grades injuries on the basis of parenchymal or subcapsular abnormality and presence of vascular

involvement.¹ Owing to the recognition of the spleen's immunological importance and the observation that more than 95% of blunt abdominal injuries may be managed nonoperatively with morbidity similar to or even lower than operative management.³ Success rate of nonoperative management is improved with interventional angioembolization as suggested by various studies, however high rate of complications following angioembolism is also documented in some studies.^{4,5}

Aims and objectives

Aim and Objectives of the study were to study the clinical presentations and modes of management in a patient with splenic trauma. To analyse the outcomes of different modes of management of splenic trauma.

METHODS

The study was done in the department of general surgery in a tertiary care centre that has round the clock availability of all radiological investigations. The study was performed according to the guidelines of the ethical committee of the institute. The data was tabulated and results were expressed using statistical package for social sciences (SPSS) software.

Design

This is a retrospective observational study conducted in government medical college, Jammu.

Duration

The duration of study was from January 2021 to December 2021.

Inclusion criteria

All cases of splenic trauma diagnosed by FAST or CT scan or per operatively and presented to the hospital were included in the study.

Exclusion criteria

All abdominal trauma patients without splenic injuries and severely injured patients that did not survive the resuscitative measures were excluded from the study.

All the patients who presented in surgical emergency during the study period with abdominal trauma and were diagnosed with splenic injury either operatively or radiologically included in the study. After initial assessment and resuscitation, patients were subjected to FAST. Patients who were haemodynamically stable were subjected to CECT Abdomen for grading solid organ injury and rule out other associated injury. Patients who were vitally unstable, had moderate haemoperitoneum on fast or had hollow viscus perforation were subjected to laparotomy. Patients with grade I to grade III splenic injury, who were haemodynamically stable were

subjected to non-operative management while the patients with grade IV and grade V splenic injury or haemodynamically unstable patients or with associated hollow viscus perforation were subjected to exploratory laparotomy. All the patients with NOM were monitored clinically with alternate FAST for two weeks. All the patients who underwent splenectomy were given polyvalent pneumococcal vaccine within 24 hours of the surgery.

RESULTS

A total of 50 patients who presented in the hospital with splenic injury diagnosed radiologically or operatively were included in the study. Age of the patients varied from 08 years to 55 years. Maximum incidence was seen in 31-40 years age group (36%) followed by 11-20 age group (18%). Male patients were affected more than female patients with male to female ratio of 15.7:1 (Table 1) In our study out of 50 patients, 46 presented with blunt abdominal trauma while 04 presented with penetrating abdominal trauma (Table 2).

Table 1: Age and gender wise distribution.

Age (Years)	Male	Female	Total	Percentage (%)
≤10	04	Nil	04	08
11-20	07	02	09	18
21-30	07	Nil	07	14
31-40	18	Nil	18	36
41-50	05	Nil	05	10
>50	06	01	07	14
Total	47	03	50	100

Table 2: Distribution on the basis of type of injury.

Type	Frequency	Percentage (%)
Blunt	46	92
Penetrating	04	08
Total	50	100

In our study, road traffic accident accounted for 40% of the patients, fall accounted for 40% of the patients, gunshot accounted for 08%, 04% were hit by animal and assault accounted for 02% (Table 3). In our study, grade III splenic injury was seen in maximum patients accounting for 36% of the patients followed by grade IV accounting for 22%. Grade II was seen 20% of the patients, grade V was seen in 14% of the patients and grade I was seen in 08% of the patients (Table 4). Patients with splenic injury were managed by both non operative management and surgical intervention. Patients who were managed conservatively usually had low grade splenic trauma with minimal or no associated abdominal or chest trauma. While patients who were managed surgically were haemodynamically unstable, having high grade splenic injury with associated other abdominal injury and chest trauma. Low grade splenic injury who were having active bleeding also went splenectomy due

to non-availability of transcatheter arterial embolisation. Out of 50 patients, splenectomy was done in 35 patients while 15 patients were managed conservatively (Table 5). In our study, 92% of the patients were discharged after management while 08% of the patients were expired. All the patients who were managed by NOM were discharged. Patients who were expired had high grade splenic injury with chest and pelvic trauma.

Table 3: Distribution on the basis of mode of injury.

Mode	Frequency	Percentage (%)
Road traffic accident	20	40
Fall	20	40
Gunshot	04	08
Hit by animal	02	04
Assault	01	02
Other mode of injury	03	06
Total	50	100

Table 4: Distribution on the basis of grade of splenic injury.

Grade of injury	Frequency	Percentage (%)
Grade I	04	08
Grade II	10	20
Grade III	18	36
Grade IV	11	22
Grade V	07	14
Total	50	100

Table 5: Management of splenic injury.

Management	Frequency	Percentage (%)
NOM	15	30
Splenectomy	35	70
Total	50	100

DISCUSSION

Spleen is the most common organ injured in patients with blunt abdominal trauma. In our study, maximum incidence of splenic trauma was found in age group of 31-40 years of age. This data is consistent with the report of Kasula et al with greatest number of patients in the age group 31-40 years.⁶ In our study, most of the patients sustained splenic injury due to blunt trauma abdomen which is consistent with other studies of Ahmed et al, Agbakwuru et al and Kasula et al.⁶⁻⁸ However, in the study by Arpit et al., penetrating trauma was the most common cause of splenic injury.⁹ The common cause of blunt trauma abdomen in our study was road traffic accident which correlates with the studies shown by Goins et al and Khanna et al.^{10,11}

In our study, most of the patients had grade III splenic trauma (36%) followed by grade IV (22%). These

findings are consistent with the studies of Chalya et al and Tan et al.^{12,13}

Patients presenting with splenic trauma had associated injuries both intra-abdominal and extra-abdominal which was seen in almost half of the patients. In our study, most common associated Injury was chest trauma (30%). Most common extra-abdominal injury was chest trauma followed by head injury (12%) and spinal trauma (10%). In the study by Mclellan et al, with blunt abdominal trauma found extra-abdominal injuries as head injury (81%), thoracic Injury (59%), pelvic injury (22%) and spinal injury in 4% of the cases.¹⁴ In the another study by Kasula et al, thoracic trauma was seen in 90.26% of the patients, pelvic trauma in 9.09% patients and head injury in 6.49% patients.⁶ In the study by Allen and Curry with blunt abdominal trauma found thoracic injury in 6.1% of the cases, head injury in 47.2%, spinal injury in 2.2% and skeletal injuries in 58.9% of the cases.¹⁵

Most of the patients with lower grade splenic trauma who are haemodynamically stable are managed by non-operative management. While patients with high grade splenic trauma and haemodynamically unstable underwent splenectomy. In our study, 70% of the patients underwent splenectomy while 30% of the patients managed by non-operative management. All of the patients who were managed by non-operative management had uneventful hospital stay and were discharged. While the patients who underwent surgical intervention, mortality was seen in 08% of the patients. Mortality was common in patients with shock and patients with associated injuries. In the study by Kasula et al, 86% of the patients underwent splenectomy with 4.51% mortality.⁶ In the study by David et al, mortality associated with splenic injury was 30%.¹⁶

Limitation of the study was-limited period study and non-availability of TAE.

CONCLUSION

Patients with splenic injury (grade I-grade III) can be managed by NOM without increased morbidity and mortality through proper monitoring. Mortality is higher in patients with splenic trauma who presented with shock and other associated injuries.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Townsend C. Sabiston's textbook of surgery, In ch. 161st South Asia edition, section III. 2007;435-6.
2. Nicholas JM, Rix EP, Easley KA. Changing patterns in the management of penetrating abdominal trauma:

- The more things change, the more they stay same. *J Trauma.* 2003;55:1095-1108.
3. Beuran M, Negoï I, Paun S, Runcanu A, Venter D, Iordache F. Selective nonoperative management of solid abdominal visceral lesions. *Chirurgia (Bucur).* 2010;105:317-26.
 4. Haan J, Scott J, Boyd-Kranis RL, Ho S, Kramer M, Scalea TM. Admission angiography for blunt splenic injury: Advantages and pitfalls. *J Trauma.* 2001;51:1161-5.
 5. Haan JM, Biffl W, Knudson MM, Davis KA, Oka T, Majercik S. Western Trauma Association Multi-Institutional Trials Committee. Splenic embolization revisited: a multicenter review. *J Trauma.* 2004;56:542-7.
 6. Kasula J, Yerroju K, Masood SV, Pindicura CV, Quadri SS. A profile of splenic trauma cases managed at a tertiary care center. *J NTR Univ Health Sci.* 2016;5:7-12.
 7. Ahmed H, Pegu N, Rajkhowa K, Baishya RK, Hiquemat N. Splenic injury: a clinical study and management in a tertiary care hospital. *Int Surg J.* 2015;2:652-9.
 8. Agbakwuru EA, Akinkuolie AA, Sowande OA, Adisa OA, Alatisie OI, Onakpoya UU et al. Splenic injuries in a semi urban hospital in Nigeria. *East Cen Afr J Surg* 2008;13:95-100.
 9. Bansal A, Bansal AK, Bansal V, Kumar A. Experience with splenic trauma in Jeevan Jyoti Hospital, Allahabad, Uttar Pradesh, India. *IJDR.* 2015;55:10-13.
 10. Goins WA, Rodriguez A, Joshi M, Jacobs D. Intrabdominal abscess after blunt abdominal trauma. *Ann Surg.* 1990;212:60-5.
 11. Khanna R, Khanna S, Singh P, Khanna P, Khanna AK. Spectrum of blunt abdominal trauma in Varanasi. *Quarterly J Surg Sci.* 1999;35(1):25-8.
 12. Chalya PL, Mabula JB, Giiti G, Chandika AB, Dass RM, McHembe MD et al. Splenic injuries at bugando medical centre in northwestern Tanzania: A tertiary hospital experience. *BMS Res Notes.* 2012;5:59.
 13. Tan KK, Chiu MT, Vijayan A. Management of isolated splenic injuries after Blunt Trauma: An institution's experience over 6 years. *Med J Malaysia.* 2010;65:304-6.
 14. McLellan BA, Hanna SS, Monoya DA. Analysis of peritoneal parameters in blunt abdominal trauma. *J Trauma.* 1985;25:393-99.
 15. Allen RB, Curry GJ. Abdominal trauma: a study of 297 consecutive cases. *Am J Surg.* 1957;93:398-404.
 16. Finelli DA, Duncan RE, Fallon WF. Current Management of Splenic Injury. *AHC Media.* 2008.

Cite this article as: Naqvi RH, Singh G, Malik AA, Kumar A, Kumar R. Study of the spectrum of splenic trauma in tertiary care centre in GMC Jammu. *Int Surg J* 2022;9:1989-92.