Original Research Paper

Trauma to Spleen: A Marker to Assess the Prognosis In Blunt Trauma to Abdomen Cases

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Abstract

It has been reported that the emergency section of Jawaharlal Nehru Medical College Hospital, Aligarh is predominantly occupied by trauma cases (85-90%) out of 100 attending per day. 40-50 patients come as a result of assault and Road Traffic Accident (RTA). This study is primarily based on Blunt Trauma to Abdomen and seeking answers to morbidity and mortality arising out of intra-abdominal splenic injury. Amazingly, before the start of the project, the authors unfailingly assumed that splenic injury carries higher risk of mortality irrespective of grading of injury to the organs.

Our study have demonstrated that out of our series of victims (n=250), 97 cases sustained splenic injury of various grading, and a single mortality was reported. Splenic injury was also involved along with injuries of other organs in the following decreasing sequence. However to make the study more precise the authors have focused research on splenic trauma scale to mortality and morbidity.

Key Words: Splenic injury, Blunt trauma abdomen (BTA), Assault, RTA

Introduction:

The emergency Department of J. N. Medical College, AMU, Aligarh, India, is an extremely vibrant section since it receive about 100 – 150 patients per day and cater to the population of about 6 lakhs.

Out of these 100 cases, 10-15 are from the medicine and allied specialties and 85-90% patients per day occupy the notoriety of surgical/ orthopedic involvement. Ironically out of these number 40-50 patients comes as a result of assault and road traffic accidents.

Our aim and objective to pursue this study was derived from the fact that in Blunt Trauma Abdomen (BTA), involvement of spleen was maximum ultimately leading to quick death or near quick death. [1]

The finding of our study extending a period of three years has revealed remarkable findings. Diagnostic techniques like USG, CT and MRI contributed vastly to this study.

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A case has been reported in which sub capsular haemorrhage of spleen took place from a fall of 3-4 feet [2] which is indicative of vulnerability of spleen from a minor blunt trauma.

Materials and Methods:

The study spanned a period of 3 years i.e. Jan 2011 to Dec 2013. All those patients who sustained blunt injury abdomen due to a variety of causes and reporting at the emergency section of J. N. Medical College, Aligarh, formed subjects for study taking due consideration in terms of consent and voluntariness. A total of 250 patients formed the study material, out of which 97 has sustained splenic injury alone. Rest 153 suffered injuries to other organs too.

Since our study focused exclusively on splenic injury, therefore 97 cases were segregated from 250 and detailed analysis was conducted on these cases only. No exclusion was done on the basis of relative age, sex, occupation, sports etc.

The trauma score follows the splenic injury scale (1994 revision). (Table A)

Result and Discussion:

It is evident from our study that out of total 97 cases the maximum number of cases of splenic injury fall in 11-20 years (29.9%); 21-30 years (23.7 %); and 31-40 years (16.5%), age groups respectively. (Table 1)

The 11-20 years period is considered as adolescent and early adulthood; hence it carries

the risk of injuries attributable to fast pace of life and less toleration. [4]

Table A: Spleen Injury Scale (1994 Revision)

Grade*	Injury type	Description of injury	ICD-9	AIS-90
I	Hematoma	Sub-capsular, <10% surface area	865-01	2
	Laceration	Capsular tear, <1cm	865.02	2
		parenchymal depth	865.12	2
II	Hematoma	Sub-capsular, 10%-50% surface area	865.01	
		Intraparenchymal, <5 cm in diameter	865.11	
				2
	Laceration	Capsular tear, 1-3cm parenchymal depth that does not	865.02	
		involve a trabecular vessel	865.12	
				3
III	Hematoma	Sub-capsular, >50% surface area or expanding; ruptured		
		Sub-capsular or parenchymal hematoma; intraparenchymal		
		hematoma $\geq$ 5 cm or expanding		
	Laceration	>3 cm parenchymal depth or involving trabecular vessels	865.03	3
			865.13	
IV	Laceration	Laceration involving segmental or hilar vessels producing		
		major devascularization (>25% of spleen)		4
V	Laceration	Completely shattered spleen	865.04	5
	Vascular	Hilar vascular injury with devascularizes spleen	865.14	5

*Advance one grade for multiple injuries up to grade III. **AIS= Abbreviated Injury Scale Moore et al[3].

Present study showed that the primary mode of injury was RTA (52.57%), males involved in 44 and females in 7 cases. Fall from height constituted 29.9% of cases, (males 20 and females 9). Assault cases constituted 15.46%. In female category assault always took place by males. No case was detected of female assaulting female in our series of study.

The last to occupy this space was fall of heavy object on to the victim (2.1%), in males' 2 and no case in female. (Table 2)

Thus it was evident that RTA is the most common mode of splenic injury. Our findings are in consistent with other studies. [5, 6]

Regarding the vehicle, largest number of cases of RTA was caused by motorcycle (45.1%) followed by light motors (23.5%), other (21.6%), heavy motors (7.8%), unknown (1.9%) in this study. (Table 3)

The maximum cases of injured victims belongs to the motor cyclists (52.9%) followed by light motor vehicle occupants (21.6%), pedestrians (19.6%) and heavy motor occupants (5.9%) respectively. (Table 4) These findings were similar to other author's studies. [7, 8]

In this study the objects of offense used to cause splenic injury were stick or any other blunt object in maximum cases (73.33%) of assaults followed by direct kick to abdomen in 26.67% cases. (Table 5) Fata P el l study also showed similar results. [9]

In this study it was noted that 48(49.5%) cases had grade-II (Fig. 1), followed by 25(25.8%) with grade-I, 18(18.5%) with grade-III, zero grade IV and 6 (6.2%) grade V splenic injuries. (Table 6) (Fig. 2, 3) It was observed that total number of cases in grade II and grade III was significantly higher.

Male and female ratio in each grade: Grade I males 21 females 4; grade II males 34 females 14; grade III males 13 female 5; grade V males 4 females 2.

In present study Average duration of stay in the hospital of grade I, grade II and grade III victims (91 cases) of splenic injury was 8.9 days. Average length of stay in the hospital of grade V splenic injury victims was 19.2 days.

Out of six cases of grade V splenic injury only single mortality was seen. [11-17]

Conclusion and Summary:

Based on this study, authors conclude that proper evolution and management can prove vital for successful outcome of the patients with blunt splenic injury.

Blunt trauma to abdomen involving spleen was most common in males, predominantly occurred in second decade of life. Main mode of injury was RTA followed by fall from height and physical assault. Grade II splenic injury was most common and mortality was reduced to one.

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Table 1: Age & Sex wise Distribution

Age Grps (Yrs)	Total Cases (n=97)	Male	Female
0-10	14 (14.4%)	10	4
11-20	29 (29.9%)	24	5
21-30	23 (23.7%)	19	4
31-40	16 (16.5%)	11	5
41-50	10 (10.3%)	6	4
51-60	3 (3.1%)	1	2
61-70	2 (2.1%)	1	1

Table 2: Mode of Injuries

Mode of injury	Cases (n=97)	Male	Female
RTA	51 (52.58%)	44	7
FFH	29 (29.9%)	20	9
Assault	15 (15.46%)	6	9
Fall of heavy object	2 (2.1%)	2	0

Table 3: Types of Offending Vehicle causing RTA

Offending vehicle	Cases (n=51)
Heavy motors	4 (7.8%)
Light motors	12 (23.5%)
Motorcycle	23 (45.1%)
Other	11 (21.6%)
Unknown	1 (1.9%)

Table 4: Types of Victim

Types of Victim	Cases (n=51)
Pedestrians	10 (19.6%)
Motorcyclist	27 (52.9%)
Light motor vehicle occupant	11 (21.6%)
Heavy motor vehicle occupant	03 (5.9%)

Table 5: Mode of Assault

Mode of assault	Cases (n=15)
Assault with stick/ lathis/ other blunt object	11 (73.33%)
Direct blow/ kick to abdomen	4 (26.67%)

Table 6: Grading of Splenic Injury

Grade of splenic injury	Cases (n=97)
Grade I	25 (25.8%)
Grade II	48 (49.5%)
Grade III	18 (18.5%)
Grade IV	0 (0%)
Grade V	6 (6.2%)

Fig. 1: Scanned Diagram of Splenic Injury Grade II on CT scan

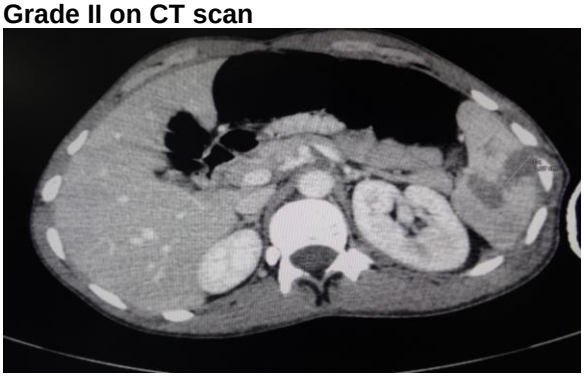

Fig. 2: Splenic Injury Grade V (Picture Taken Post Splenectomy)

Fig. 3: Scanned Diagram of Splenic Injury Grade V on CT scan