



RETROSPECTIVE STUDY OF CLINICAL PROFILE AND MANAGEMENT OF LIVER TRAUMA IN TERTIARY CARE HOSPITAL.

Surgery

Dr. Ravindra M Kattimani*

Assistant Professor Department of General Surgery Dr. D Y Patil medical college and Hospital Nerul, NaviMumbai Ex-Senior resident Trauma unit, LMTMMC, Sion, Mumbai
*Corresponding Author

ABSTRACT

Background: Road traffic accidents as well as blunt trauma have become the major cause of death and disability in young population. The morbidity and mortality associated with liver trauma is still high.

Methodology: The Retrospective study of cases records was conducted in Department of General Surgery, LTMMC, Mumbai between January 1997 to May 1998. All 60 cases of liver injuries following trauma were considered as diagnosed by operative findings, ultra sonography or CT scan findings, post mortem findings. All patients were examined carefully and their findings noted. All cases of penetrating injuries with peritoneal breach underwent emergency exploratory laparotomy. Clinically Stable patients were evaluated further. The patients, who underwent laparotomy, abdomen was opened by midline incision and appropriate surgical intervention was done. All patients were monitored in trauma unit till they get stabilised.

Results: Total 60 cases admitted, 54 (90%) were males and 6(10%) were females. 46 (76.7%) cases were presented with abdominal blunt trauma which was the frequent cause of hepatic injury. 26 (43.3%) cases had grade II liver injury and 17 (28.3%) patients had grade I liver injury. 16 patients were managed with conservative treatment and 43 patients were managed by various surgical procedures.

Conclusion: It is concluded that road traffic accident is most common cause of blunt abdominal trauma and liver is the most commonly affected organ and 73% cases had associated injuries. 26 % cases were successfully treated conservatively and 43 patients underwent laparotomy.

KEYWORDS

blunt abdominal trauma, liver injury, laparotomy, shock, chest injury

Introduction:

Road traffic accidents as well as blunt trauma have become the major cause of death and disability in young population especially in the first four decades of life. Road traffic injuries (RTI) are a large and growing public health burden, especially in developing countries where 90% of the world's deaths due to RTI are estimated to occur. [1] Liver is the one of the commonest intra abdominal organ to get injured. Poorly managed liver injury combined with associated injury may result into significant morbidity and mortality.

The morbidity and mortality from liver injuries in developed countries has shown drastic decline in last few decades. This change in out is because of early patient's presentation, early diagnosis, better critical care, damage control strategies, antibiotics, blood transfusions and imaging interventions.[2- 5] But in India and other developing countries the morbidity and mortality associated with liver trauma is still high. Trauma in India is an increasingly becoming significant problem, largely as a result of rapid development, increasing motorization, increasing numbers of motor vehicle crashes and urban violence. [5] The abdomen is often injured by both penetrating and blunt trauma. [6] Blunt trauma occurs usually because of accidents involving motor vehicles, falls, explosions and sports injuries. Penetrating trauma is caused by stabbing or gunshot projectiles. [7]

Liver is the biggest organ of the abdomen with high-vascularity. The liver is one of the most frequently injured organs in abdominal trauma. Because of its anterior location and fragile parenchyma with easily disrupted Glisson's capsule make this organ vulnerable to injury. [8] Liver injury is the second most common event during trauma of the abdomen. In developed nations trauma of the liver trauma is 20% due to blunt abdominal injury, 30% due to gunshot and 40% due to the stab injury. [9] Right hepatic lobe is more frequently injured as compare to left lobe because of its big size, less mobility.

Surgical management of Hepatic traumas is the big challenge for the surgeons. The surgical techniques opted depends on kind of liver trauma, its severity and good experience of skilled surgeons.[10] The Principle objective of a managing "liver trauma" is early control of the haemorrhage and sepsis and ischemia prevention. The range of therapeutic options available today are more ever before and varies from non operative management to major hepatic resection, extra corporeal repair of liver and even liver transplantation.

In this contest, an attempt has been made to study clinical profile and management of liver trauma in tertiary care hospital.

Materials and Methods:

A retrospective review study of medical records of 60 cases of liver injuries following trauma admitted in trauma care unit was done at the Department of General Surgery, LTMMC, Mumbai between January 1997 to May 1998. For this type of study formal consent is not required. The study included 60 patients of either gender and all age who presented with liver trauma. All cases of liver injuries were considered as diagnosed by operative findings, ultra sonography or CT scan findings, post mortem findings.

All patients were examined carefully and their findings noted. For all the patients with shock, central venous line was used immediately for rapid infusion and monitoring of CVP. Emergency blood investigations were done immediately and urinary catheter were passed for all patients.

All cases of penetrating injuries with peritoneal breach underwent emergency exploratory laparotomy without further diagnostic investigations. Four quadrant abdominal tapping was done in all blunt trauma patients. Clinically Stable patients were evaluated by clinical examination, abdominal tap sonography and CT scan. Arrangement for fresh cross matching of blood was made in all cases.

In all the patients, who underwent laparotomy, abdomen was opened by midline incision with evacuation of blood and contaminants. Liver was mobilised and temporary control of major hepatic haemorrhage was done by Pringle's manuvre or laparotomy pad compression. Abdomen was closed in monolayer and closed drain was kept. All patients were monitored in trauma unit till they get stabilised.

Results:

Total 60 cases admitted between Jan 1997 to May 1998 were studied. Out of 60 patients, 54 (90%) were males and 6(10%) were females. The age of the patients ranged between 3-70 years with maximum young patients of 26 cases (43.3%) between ages 21-30 years. (Table 1)

The mode of injury included were railway accidents (n= 14; 23.3%), RTAs (n= 23; 38.4%), falls (n= 8; 13.3%), stabs (n= 12; 20%) gunshot injuries (n= 1; 1.7%), and others (n= 2; 3.3%). According to mechanism of injury, blunt trauma was in 46 (76.7%) cases and penetrating injury was in 14(23.3%) cases. (Table2)

25 (41.6%) patients presented with shock and 35 (48.4%) patients without shock. 15 (25%) cases had right chest injury. On per abdominal examination, 52 (86.7%) cases had tenderness, 40 (66.7%) patients had guarding and 12 (20%) cases had rigidity. Total incidence

of associated injury was 73.3% (44) patients and 26.7% (16) patients had only liver injury. 33.3% (20) cases had associated chest injuries, of right sided chest injury was seen in 65.2% (15). 23.3% (14) patients had head injuries, 26.7% (16) cases had other abdominal injuries and 26.7% (16) cases had associated orthopaedic injuries. (Table 3)

According to liver injury grading, there were 17 (28.3%) patients with grade I injury, 26 (43.3%) with grade II injury, 13 (21.7%) with grade III injury, 3(5%) with grade IV injury and 1(1.67%) with grade V injury.(Table 4)

16 patients were managed with non-operative treatment while 1 patient died before treatment and 43 patients were managed by various surgical procedures.

In 36 patients, liver suturing was done, in 4 patients perihepatic packing was done, in 1 patient resectional debridement was done, in 1 patient tractotomy was done and 1 patient was explored and left alone. (Table 5)

Table 1: Gender & Age Distribution

Characteristics	Number	Frequency (%)
I. Gender		
Male	54	90%
Female	6	10%
II. Age		
Age range	Number	Frequency (%)
<10	6	10%
11-20	10	16.7%
21-30	26	43.3%
31-40	6	10%
41-50	7	11.7%
>50	5	8.3%

Table 2: Profile of mode and mechanism of Injuries

I. Mode of Injuries		
Characteristics	Number	Frequency (%)
Railway Accidents	14	23.3%
Road Traffic Accidents	23	38.4%
Falls	8	13.3%
Stabs	12	20%
Gunshot Injuries	1	1.7%
Others	2	3.3%
II. Mechanism of Injuries		
Blunt trauma	46	76.7%
Penetrating Injury	14	23.3%

Table 3: Profile of clinical presentation and Associated Injury

Clinical presentation	Number	Frequency (%)
1.Shock	25	41.7%
2.Per abdominal finding		
Tenderness	52	86.7%
Guarding	40	66.7%
Rigidity	12	20%
3.Associated Injury		
1) Chest injuries	20	33.3%
Right sided	15	65.2%
Left sided	5	21.7%
Bilateral	3	13.1%
2) Head injuries	14	23.3%
3) Other abdominal injuries	16	26.7%
4)Orthopaedic injuries	16	26.7%
5) Soft tissue injuries	2	3.3%
4. No associated injuries	16	26.7%

Table 4: Profile of grade of liver injury

Grade of liver injury	Number	Frequency (%)
I	17	28.3%
II	26	43.3%
III	13	21.7%
IV	3	5%
V	1	1.67%

Table 5: Mode of Treatment

Mode of treatment	Number	Frequency (%)
Death before treatment	1	1.6
Non operative treatment	16	26.6
Explored and left alone	1	1.6
Liver suturing done	36	60
Tractotomy	1	1.6
Resectional debridement	1	1.6
Perihepatic packing	4	6.6

Discussion:

Liver is the highly vascular and the vital organ of the human body. Liver is largest solid organ in the abdominal cavity with relatively fix position that's why it is more prone for trauma. Liver trauma is overwhelmingly more common in males in the third and the fourth decades of life.

In our study males represents 90% and female represents 10%. The peak age of trauma was between 21-30 years representing 43%. In a study by A F Saleh, males represent 80 % and females represent 20 % and of the peak age for trauma found was 11–30 years.[11] Vatanaprasan in their study found most of the patients were male (81.5%) and mainly affected third decade of life (46.9%).[12] Another study by Kalil reports out 107 cases, 93 were male (86.9%) and 14 female (13.1%). and 83.2% were in the first four decades of life. [8] This confirms with the age and sex incidence of trauma in general. This essentially represents working and active population of the society which is more exposed to accidents as well as assaults.

38.4% of liver injury was due to road traffic accidents in our study (table 2) compare to 46.8% in Bender at al [13] study and 53.3% in study by Saleh AF at al. [11]

In our study, 76.7% of total cases had liver injury due to Blunt abdominal trauma (table 2). Beal at al [14] reported 64% cases of blunt trauma. Similarly, in different other studies, it is reported that, blunt abdominal trauma is frequent cause of the hepatic injuries. [15-18] Inconsistency with our study, the study by Usman Ali et al [19] stated that 75% patients presented with penetrating abdominal trauma and Asensio et al [20] demonstrated that 79% cases had hepatic injuries due to penetrating abdominal trauma.

In our study, 25 (41.6%) patients presented with shock and 35 (48.4%) patients without shock. 15 (25%) cases had chest injury. On per abdominal examination, 52 (86.7%) cases had tenderness, 40 (66.7%) patients had guarding and 12 (20%) cases had rigidity (Table 3). Study by Davis at al reported generalised tenderness, abdominal guarding as most frequent finding being present in more than 75% cases, rigidity in 28% cases and hypovolemic shock in 12% cases.[21]

Total incidence of associated injury was present in 73.3% cases, chest trauma was seen in 25%of total cases and 65.2% chest injury was on right side (table 3). Similarly a study by Mitre K at al found associated chest trauma in 54.7% cases. [14] Stain at al reported right sided chest injury in 59% cases. [22]

According to liver injury grading, our study presents 28.3% patients with grade I injury, 43.3%cases with grade II injury, 21.7% cases with grade III injury. 5% cases with grade IV injury, 1.67% cases with grade V injury (Table 4). Similarly, Usman Ali et al, demonstrated that majority of cases was with grade II, III, IV, percentage as; 16.66%, 58.8% and 21.6% respectively. [19]

This reflects upon the large number of cases which can be potentially be treated conservatively.

In this study, 16 (26.6%) patients were treated non operatively and 43 (71.6%) patients were treated by operative management (Table5). Due availability of CT scan and sonography techniques, even minimal injury to liver can diagnosed. Hence the percentage of conservative management has been increased. The study by S. Buci1at al showed that conservative treatment was be successful in 42.2% of patients with combined hepatic trauma and in 58.7% of patients with isolated hepatic trauma.[23] In some other studies, it has been reported that the efficacy of conservative management of liver trauma in hemodynamically stable patients is between 87 and 98%. [24, 25]

Thus non operative management can be safely practised in selected patients and the clear demonstration that these intra hepatic lesions have capacity for spontaneous healing force.

Out 43% cses who underwent operative management, in 36 patients (60%) simple liver suturing with haemostatic agent was done, in 4 patients (6.6%) Perihepatic packing was done, one patient resectional debridement done and one patient who had small laceration was left alone. Thus suture hepatorrhaphy and Perihepatic packing constituted our most frequently performed procedures. This conforms to other reported studies. [12, 26-28]

Conclusion:

A retrospective study of 60 cases with liver injury admitted between Jan 1997 to May 1998 in a trauma care unit of tertiary care hospital is presented. Like other injuries, liver injuries are also commonly seen in males in 3rd and 4th decades of life.

In civilian practice more than $\frac{3}{4}$ cases were as a result blunt trauma and mainly road traffic accidents. Only $\frac{1}{4}$ cases had isolated liver injury and $\frac{3}{4}$ cases had associated injuries. The commonest associated injury was right sided chest trauma. About 40% cases presented with shock.

All patients with penetrating injury underwent exploratory laporotomy. The blunt trauma cases underwent further evaluation with investigations. Nearly $\frac{1}{4}$ cases were successfully treated conservatively. Non operative management was considered in hemodynamically stable patients. 43 patients underwent laporotomy. Majority (83%) of them required liver suturing with or with local haemostatic agent. 4 (9%) patients had severe bleeding and required perihepatic packing.

Conflict of interest: No Conflict of interest

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