

Hepatic Trauma: Effects of Delay in Presentation

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Objective: Hepatic trauma carries a substantial amount of morbidity & mortality. **Purpose of study:** The purpose of the study is to study the effects of delay in initiation of management of patients suffering from hepatic trauma. **Design:** Prospective study. **Place & duration:** The study was carried out in the Department of Surgery, Mayo Hospital Lahore from the year 1995-1997. **Patient & methods:** 57 patients were included in this study. They were operated and different methods of repair were employed. **Results:** 57 patients were studied. 50 were males, 7 were females. They belonged to an age range of 12-62 years. 55.7% patients suffered from blunt trauma while the rest of the cases were of penetrating injury. Over 50% of the patients presented within 4 hours of injury. All of the patients were operated and there findings noted. Different types of haemostatic measure were employed. There were ten mortalities in this study. **Conclusions:** Early presentation to the hospital of hepatic trauma cases, has a good impact on the ultimate outcome of the patients.

Key words: Hepatic trauma, blunt trauma.

Trauma deaths occur at traditionally recognized time points after injury. Hemorrhage within hours being the second mortality peak, causing 30% of deaths and complications of operations being the third peak of mortality. Liver injury being one of the most leading cause of morbidity and mortality in cases of abdominal trauma. By shortening the transfer time of the patients to the hospital, the outcome of the patient can be improved. In this article we will present our experience of the effects of delay in presentation of patients on outcome.

Material and methods:

The study was conducted over a period of two years. During this period 57 patients suffering from hepatic trauma and ranging between 12 & 62 years of were admitted in the ward. Patients with both blunt and penetrating were considered for evaluation in the study. The diagnosis of hepatic trauma was suspected in all cases sustaining injury to the right hypochondrium or right lower chest. The selected cases were the ones in whom the diagnosis of hepatic trauma was confirmed. The diagnosis of liver injury was not difficult in cases of penetrating injury. All patients were clinically assessed particularly with reference to the hemodynamic status. Resuscitation was instituted immediately and routine investigations were sent. Where time allowed appropriate investigations like X-ray chest and abdominal ultrasound were done. Upon quickly reaching the decision, laparotomy carried out. Abdomen was explored through a midline incision. Amount of blood in the peritoneal cavity was noted. Liver injuries were graded as fallows.

Grade I: Capsular avulsion and parenchymal fracture less than 3cm

Grade II: Parenchymal fracture between 1 to 3 cm.

Grade III: Parenchymal fracture more than 3cm.

Grade IV: Lobar tissue damage/ avulsion.

Grade V: Shattered liver.

Grade VI: Pedicle avulsion.

Rest of the findings noted. The hepatic injuries were appropriately dealt-with, utilizing techniques such as sutures, resection (segmental, lobar) or packing. Post operative course of the patients was closely monitored especially with reference to postoperative complications and mortality.

Results:

Total of 57 patients were studied. Of these 50 were males and 7 were females. All of the patients belonged to the age range of 12-62 years. 29 (50.87%) patients presented with blunt trauma while 28 (49.12%) patients received penetrating injuries. Majority of the patients presented to the hospital within 4 hours of infliction of the injury.

Table I: Time of presentation after injury

Time of Presentation	No of Patients
Within 01 hour	00
Within 02 Hours	10
Within 03 Hours	11
Within 04 Hours	09
Within 06 Hours	12
Within 08 Hours	12
Within 10 Hours	03

Severe hemodynamic instability was seen in 43(75.43%) patients. There were 23(40.35%) patients with no recordable pulse and blood pressure, while 20(35.08) patients had pulse > 100/min and systolic blood pressure <80 mmHg. 14(24.56%) patients were relatively stable with a pulse <100/min and blood pressure >100mmHg.

Common associated injuries were small gut perforation 12.2%, rib fracture 8.7% diaphragmatic tear 10.7% and retroperitoneal haematoma 8.7%. Laparotomy was done and the injuries were graded according to the classification mentioned above. Results are as follows.

Table II: Grade of injuries

Grade	No of Patients
I	00
II	22
III	20
IV	12
V	03
VI	00

Various methods of dealing with liver injuries were employed for controlling hemorrhage. During the post operative course these patients went through various complications. Majority suffered from hemorrhage (8)14%, hypoglycemia (6) 10%, jaundice (6) 10%, intra abdominal sepsis (6) 10% etc.

During the post operative period these patients required repeated blood transfusions (Table IV).

Table III: Table of Complications

Complications	=n
Early	
Haemorrhage	08
Hypoglycaemia	06
Delayed	
Respiratory Complications	03
Intra-Abdominal Sepsis	06
Wound Infection	04
Wound dehiscence	04
Jaundice	06
Biliary fistula	03
Remote	
Bile Peritonitis	01
Liver Abscess	02
Mortality	10

Table IV: Transfusion required

Time of presentation	=n	Average no of blood bags required/ patient
Within 1 hour	00	00
Within 2 hours	10	1-3
Within 3 hours	11	2-4
Within 4 hours	09	4-6
Within 6 hours	12	5-8
Within 8 hours	12	8-10
Within 10 hours	03	>12

Ten (17.54%) patients died in the study. The statistics of morbidity and mortality with reference to the delay between injury and time of presentation to the hospital are as follows.

Table V: Relation of delay with morbidity & mortality

Time of presentation	=n	Morbidity	Mortality
Within 1 hour	00	00	00
Within 2 Hours	10	02	00
Within 03 Hours	11	02	00
Within 04 Hours	09	04	01
Within 06 Hours	12	08	03
Within 08 Hours	12	08	04
Within 10 Hours	03	02	02

Discussion

Hepatic trauma is a frequent finding in blunt and penetrating injuries of the abdomen. It takes a toll (37%) of all the abdominal injuries¹. These injuries may be major or minor depending upon the grade of injury. Whatever the case these patients require prompt diagnosis and early intervention².

The present study consists of 57 patients. The purpose of this study was to study the effects of interval between the onset of injury and initiation of management, on the ultimate outcome of the patient³.

All of the patients belonging to different grades of hepatic injury were distributed according to the time of presentation to the hospital. Over half of the patients presented within 4 hours of the onset of injury. Rest of the patients presented between 4-10 hours⁴.

The patients who presented early, although having different grades, were relatively more stable hemodynamically. These patients were easily resuscitated with intravenous crystalloids and later operated. On the other hand sustained pre-operative hemodynamic stability could not be achieved in the late presenter group and they had to be operated early. Similarly the patients who presented early required lesser number of blood transfusions, while patients presenting late had to be transfused massively⁵.

During the postoperative period these patients suffered from numerous postoperative complications. Those who presented early had lesser number and severity of these complications⁶. On the other hand patients presenting late had a very high complication rate both in terms of type & severity. The mortality amongst the late presenter group was considerably much higher⁷.

Various factors contribute to this high incidence of morbidity and mortality in the late presenter group. These are as follows:

- The hypovolemic shock when allowed to persist initiates a sequence of events in which there is a release of mediators of inflammatory response. This ultimately leads to SIRS & MODS if not controlled. This holds true in our late presenter group who suffered from varied number of complications relating to this inflammatory response⁸.
- The patients were in hypovolemic shock and had to be given blood transfusions⁹. Those who had to be transfused massively were the ones who developed life threatening complications. These were the patients who belonged to the late presenter group¹⁰. Blood transfusions apart from causing problem of overload, can lead to complications like sensitization, allergic reactions coagulation disturbances, infectious disease transmission etc. These further add to the burden on the already compromised patient. Thus increasing the morbidity and mortality.

Conclusion:

It is evident from the study that there is a critical time period of around 3-4 hours after which the morbidity & mortality rates start to increase drastically in patients with hepatic trauma. Every possible measure should be taken to expedite the transport of a patient with abdominal trauma to the hospital. This would require a great effort to educate the community.

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