

# Blunt liver trauma: selective conservative approach..

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## ABSTRACT

**Objective:** to highlight the scope of conservatism in the selective blunt liver injuries in patients who are hemodynamically stable. **Study design:** prospective non-interventional descriptive study. **Place and duration of study:** the study was conducted in Surgical Unit-I and IV of Allied and DHQ Hospitals, PMC, Faisalabad, during three years from August 2004 to August 2007. **Patients and Methods:** out of 45 patients received during this period, 28 were hemodynamically unstable and were immediately explored, the remaining 17 were enrolled in the study who were managed conservatively. After resuscitation all the patients underwent Ultrasound and then followed up with serial Hb% estimation and repeat ultrasound scanning in the High Dependency Unit of the wards. The patients were discharged on 7<sup>th</sup> day, if the hematology and check

Ultrasound scan was normal with the advice to restrict physical activity and the regular follow-up in the OPD.

**Results:** out of the 17 patients treated conservatively, 14 were male and only 3 were females. The SGPT levels were elevated in 84%. More than one liter of hemoperitoneum was detected in two cases who were given 4 units of blood and 11 of the 17 patients needed blood transfusion.. there was no missed intraabdominal injury in our series. The mean length of hospital stay was 10.2 days. The two patients(11.76%) developed perihepatic abscess and were treated by subcutaneous drainage.

**Conclusion:** Selective non-operative approach is a valid policy for patients with blunt liver trauma who are hemodynamically stable.

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## INTRODUCTION:

Operative approach used to be the standard treatment for all blunt liver injuries but with the availability of better diagnostic and monitoring modalities, conservative treatment for selective blunt liver injuries has evolved into a common practice[1,2].

It has been observed that many liver injuries has stopped bleeding at the time of surgical intervention and needed little or no treatment. Improvement in resuscitation, careful monitoring in high dependency unit, coupled with advances in diagnostic tools has helped to make a non-operative policy possible and acceptable [3,4].

The objective of the study was to highlight the scope of conservatism in the selective blunt liver injuries in patients who are hemodynamically stable.

### PATIENTS AND METHODS:

Out of total No. of 45 patients with blunt liver trauma, managed during the period of three years from August 2004 to August 2007, 28 were hemodynamically

unstable and were immediately explored; the remaining 17 were enrolled in the study.

Table-I

Mechanism of injury	No. of patients
Bamboo cart injury	8
Road traffic accident	4
Motor vehicle accident	2
Fall from height	2
Animal kick	1
<b>Total</b>	<b>17</b>

Table 1: Mechanism of injury

### EXCLUSION CRITERIA:

- Associated hollow viscous injury.
- Associated diaphragmatic injury.
- Evidence of massive bleeding
- Persistent hypotension in spite of active resuscitation
- Transfusion of more than five units of blood.

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**INCLUSION CRITERIA:**

- Patients with liver injuries documented on USG/CT scan, who were hemodynamically stable.
- Transfusion requirement of less than four units of blood.
- Absent other into abdominal injuries.

Initial resuscitation was followed by sending the blood samples for routine hematology and biochemistry i.e. liver enzymes and serum amylase levels, and blood grouping and cross matching.

After resuscitation all patients underwent USG for any collection in the pelvis, Morrison's pouch or intra-hepatic tear and collection. Additional investigation carried for fear of other organ injuries. The amount of hemoperitoneum was quantitated as below;

Minimal blood in the perihepatic and the subphrenic space ----- ~ 500 ml

Moderate blood in the perihepatic and the paracolic gutter ----- ~ 1000 ml

Large amount of blood in the perihepatic, paracolic gutter and the pelvis ----- >1000 ml.

Once the diagnosis for liver injury was established, all the patients were admitted in the HDU and kept under close observation. All the patients were monitored in HDU for serial Hb% assessment every 8hours.

All the patients were advised to restrict their activity quietly in the bed for 48-72 hours. When six serial Hb% assessments were stable and USG findings had not worsened, the patients were shifted to the ward and allowed quiet activity. On the 7<sup>th</sup> day, if there was no significant alteration in the hematology and check USG findings were stable, the patients were discharged home with the instructions to observe restricted activity at home for three weeks from the time of injury. Moreover these patients were regularly followed up weekly in the OPD for hematocrit and follow-up ultrasound for 6-8 weeks.

**RESULTS:**

The study included 45 patients with blunt liver trauma. 28 patients were either hemodynamically unstable and/or having other associated abdominal injuries and were immediately explored, or there

was failure of the conservative treatment. The remaining 17 patients were treated conservatively as per protocol.

Out of the 17 patients, 14 were male and three were females. Men constituted 82.35% of the population.

The initial physical examination detected tenderness in all the patients. There were elevated serum SGPT levels in 12 patients. Bilirubin level was elevated in four patients, both the values returned to normal within a week.

There were associated injuries in some of the cases and are listed in the table-II

Associated injury	No. of patients
Fracture right lower ribs	4
Right hemopneumothorax	2
Fracture pelvis	1
Fracture long bones	1
None	9

Table-II: Associated injuries

More than one liter of intraperitoneal fluid detected in two cases and 500ml to one liter in six cases and small amount in five cases and in three cases there was no intraperitnoeal fluid detected on USG.

Blood transfusion was given to 11 of the 17 cases during their hospital stay as shown in the table-III

No. of patients	Units transfused
6 cases	No transfusion needed
4	Three units/patient
3	Two units/patient
2	Four units/patient
2	One unit/patient

Table-III: No of blood transfusions

In none of the patients there was ongoing bleeding requiring blood transfusion. The patients requiring blood transfusion were having associated injuries like hemothorax; fracture of the pelvis or of the long bones.

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The length of hospital stay was 7-14 days with an average stay of 10.2 days in the hospital. There was no mortality in our study. The only morbidity observed in our study was in two cases in which they developed perihepatic abscess which were drained subcutaneously under ultrasound guide with successful outcome.

## DISCUSSION

The classic paper on liver injuries by Pringle in 1908 has misled the subsequent generations of surgeons that significant lacerations of liver is incapable of spontaneous hemostasis because of its peculiar structure [5]. As long as late 70,s, operative treatment for blunt liver injuries used to be considered as the only acceptable treatment. The advent of breakthrough of the imaging technology subsequently changed this surgical philosophy [6].

The additional realization that in as many as 86% of all blunt liver injuries bleeding would have been stopped at the time of surgery. Moreover with the recent successive studies revealing high successful outcome in conservative management reaching up to 85-90% in many published reports, suggested that non operative approach is an accepted treatment for blunt liver trauma [2,6,8].

Any physiological instability after initial resuscitation demands laparotomy and until continued bleeding has been ruled out, intensive monitoring is necessary in High Dependency Unit under the care of an experienced surgical team [2,4,7].

In our study, non-operative management was successful in 88.23% of patients. Two cases developed the perihepatic abscess which was drained under ultrasound guide. This is comparable to findings reported by Croce et al [8] who reported a success rate of up to 90%. Other studies have documented a success rate of 85% to 100% in their patients [7,9,10].

The liver injury scale by the American association for the surgery of trauma can be used as a measurement to standardize and compare the data[11]. But in contrast, many studies like Moon

and Federle (1993) found that need for exploratory laparotomy in liver injury is more correlated with the amount of hemoperitoneum rather than the size of liver laceration[9], that's why we relied solely on the initial Ultrasound findings followed by serial USG follow-up for our patients.

In our study, like that of Mulhim and Muhammad, neither the grade of liver injury nor the hemoperitoneum could predict the need for laparotomy[12]. These results were in accordance with the study of Hiatt et al(1990), who suggested that the decision for laparotomy should be determined by the patients overall clinical picture and not by "exact nature of the injury"[13].

The SGPT values were elevated in 12 cases (84%). The level of SGPT was normal in 16% despite the evidence of liver injury on initial ultrasound. This is comparable to the observations made by Mulhim and Muhammad that neither the normal values of SGPT nor the elevated values predict the need for laparotomy. The critics of selective non-operative approach cite the three major objections to the conservatism. Firstly, missing the other intra-abdominal injuries with its added morbidity/mortality. Secondly, excessive blood transfusion with its attendant risks, and thirdly, the prolonged hospital stay.

The rate of missed injury in the literature is ~ 3%, mainly being the small bowel injury and the diaphragmatic tear. In our study, there was no missed intra-abdominal injury which is comparable to the study of Atef El-Gamal et al [18].

Patcher and other reports of multicenter experience with 495 patients and Croce and other reports documented mean transfusion rate of 1.9 units/patient. In our study, the mean transfusion rate was 1.25 unit/patient [14,15].

Similarly, the length of hospital stay for the patients treated conservatively did not prove to be excessive. Mean hospital stay in the study of Patcher and others with 495 and 404 patients in two successive studies was 13 days, while in our

study, the mean hospital stay was 10.2 days [16,17].

### CONCLUSION

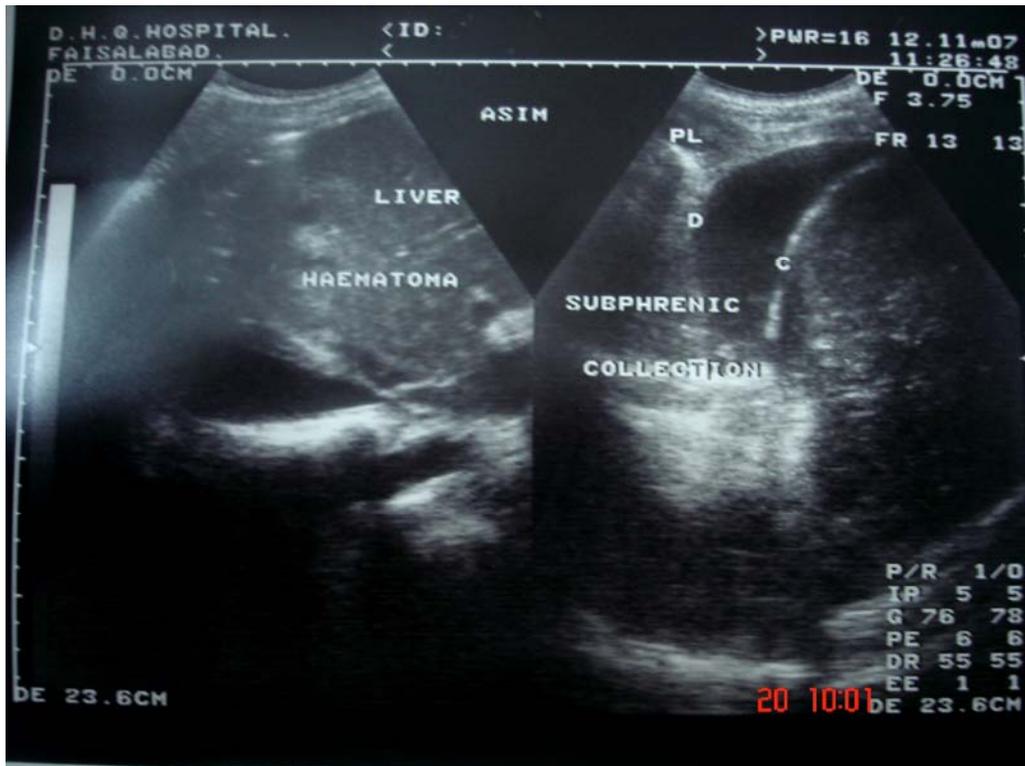
In conclusion, our study has re-affirmed the validity of selective non-operative approach for the management of blunt liver trauma. The most important decision facing the surgeon is to decide "when not to operate". Hemodynamic instability demands operation while those who are stable on admission or those who respond quickly to resuscitation can be managed non-operatively reducing the number of unnecessary laparotomies. Less common complications like bilioma or perihepatic abscess can almost always be managed with ultrasound guided percutaneous drainage.

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## EDITORIAL COMMENTS

With increasing number of vehicles on the roads and fastness of life, number of road traffic accidents has increased enormously. This has lead to lot of morbidity and mortality. These road traffic accident patients are usually suffering from multiple injuries and are dealt with in the emergency ward by multiple specialties i.e., General Surgery, Neurosurgery and Orthopaedics department. Blunt abdominal trauma is a frequent injury in these patients and solitary liver trauma can be diagnosed with the help of ultrasonography. It can grade the injury and pick those patients to be managed conservatively. This article is a good attempt to highlight the indications and results of solitary blunt liver trauma patients to be managed conservatively and sparing the resources of

the hospital spent over unnecessary operations and also avoiding morbidity to these trauma patents.

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