

A Prospective Study On The Management Of Liver Injuries:Our Experience

Sreedhar rao k¹, Ravi shankar K², Venkateswar P³, Janardhan J⁴, Shalini T⁵

Abstract:

Aims And Objectives: To estimate the incidence of Liver Trauma Injuries and Grade their severity injury among patients attending to causality department, at Osmania General Hospital, Hyderabad and to evaluate the Surgical options and common surgical hemostatic procedures in the management of Liver Trauma..

Results: In the present study the maximum number of patients are in the age group of 21-39 years (60%). Mean age of presentation is 28.96 years (12-65 years). Death rate among > 40 years age group was 87.5%, higher than age group of <40 years. The most common grade of injury was grade II constituting 30%. Survival rate of patients with intra operative findings of grades I, II and III injuries was 69% higher than patients with grade IV, V and VI injuries. More than one surgical technique was used to secure surgical hemostasis. 92.5% (37/40) Hepatorraphy with or without gel foam augmentation is for surgical hemostasis. Peri-hepatic packing is used in 12.5% (5/40) of patients.

Conclusion: This prospective study of 50 patients at Osmania General Hospital, Hyderabad was done from June 2012 to October 2014 (28 months) with aim of presenting the incidence, grade of liver injury and various surgical methods employed. The incidence of Liver Trauma is 22.3% in Osmania General Hospital. The most common age group involved in the injury are younger age group (21- 40 years) younger patients had good prognosis. Various surgical techniques like hepatorraphy with and without gel foam augmentation, peri-hepatic packing, resectional debridement and resectional procedures are employed in the surgical management.

I. Introduction

Despite its well protected position, the liver is frequently involved in intra-abdominal injury. In India automobile driver sitting on right side, due to greater exposure of right torso, that is against door of automobile, Liver is the organ often involved.

Road traffic and assaults are increasing day to day with the civilization, so with the rise in Liver Injuries. Due to the advances in the management of Liver injuries the morbidity and mortality have come down when compared to past.

II. Materials And Methods

Sample: The present prospective study was of 50 patients who admitted at Osmania General Hospital, Hyderabad who were managed operatively or non-operatively for abdominal trauma and having liver injury forms the material of the study. This study was conducted over a span of 28 months from June 2012 to October 2014.

Inclusion Criteria:

- Age above 15 (female and male)
- History of blunt/penetrating injury to abdomen with liver involvement

Exclusion Criteria:

- Patients with debilitating illnesses before trauma such as chronic respiratory/ renal/ GI/ CNS disorders are excluded.
- Patients who had severe head injury with GCS scores below 8 were not included into the study

Methods

All patients were first received at casualty Department and General Survey of the patient is done and injuries noted. After securing airway and breathing an intravenous line is secured and blood is drawn and sent for blood grouping and typing, cross matching, urea and sugar, hemoglobin percentage. Initially ringer's lactate is infused for resuscitation. Depending on severity of injury if the patient is not responding to initial crystalloid, compatible whole blood transfusion are given which are brought after cross matching from our own blood bank. A brief history about the time of injury, mode of injury and complaints with special reference to pain abdomen, vomiting and distention of abdomen is taken. Specific examination of abdomen is done with special reference to tenderness, guarding, rigidity, presence of free fluid and bowel sounds.

III. Results

Total numbers of 50 cases were included in our study who were assessed and treated. The data was collected, analysed and the following observations were made and inferences were drawn.

Age in years	Survival	Death	Total
Up to 19 years	8(100%)	0	8(16%)
20-29 years	21(91.3%)	2(8.7%)	23(46%)
30-39 years	9(90%)	1(10%)	10(20%)
40-49 years	3 (50%)	3(50%)	6(12%)
> 50 years	1(33.3%)	2(66.7%)	3(6%)
Total	42(84%)	8(16%)	50(100%)

Distribution of patients in relation with age

It is clear from the data that maximum number of patients are in the age group of 21-39 years (60%). Mean age of presentation is 28.96 years (12-65 years). Death rate among > 40 years age group was 87.5%, higher than age group of <40 years. . This observed difference was statistically significantly (P= 0.0084) at 95% confidence

Distribution of patients in relation to Grade of Injury

Grade of Liver Injury	Survival	Death	Total
I	13(100%)	0 (0%)	13 (26%)
II	15 (100%)	0 (0%)	15 (30%)
III	10(83.33%)	2(16.67%)	12(24%)
IV	3(37.5%)	5(62.5%)	8(16%)
V	1(100%)	0	1(2%)
VI	0 (0%)	1 (100%)	1 (2%)
Total	42(84%)	8(16%)	50 (100%)

The most common grade of injury was grade II constituting 30%. Survival rate of patients with intra operative findings of grades I, II and III injuries was 69% higher than patients with grade IV, V and VI injuries. This observed difference was statistically highly significant (P= 0.00025) at 95% confidence intervals

Distribution of patients in relation to surgical hemostasis

Surgical hemostasis procedure	Survival	Death	Total
Hepatorraphy alone	9 (100%)	0	9(20.93%)
Hepatorraphy with Abgel	26 (100%)	1	27(62.7%)
Resectional debridement	0	2	2(4.65%)
Perihepatic packing	1 (20%)	4 (80%)	5 (11.62%)
Total	36 (83.7%)	7(16.2%)	43

More than one surgical technique was used to secure surgical hemostasis. 92.5% (37/40) Hepatorraphy with or without gel foam augmentation is for surgical Hemostasis. Peri-hepatic packing is used in 12.5% (5/40) of patients.



Fig 1: Hepatorraphy



Fig 2: Abgel placement

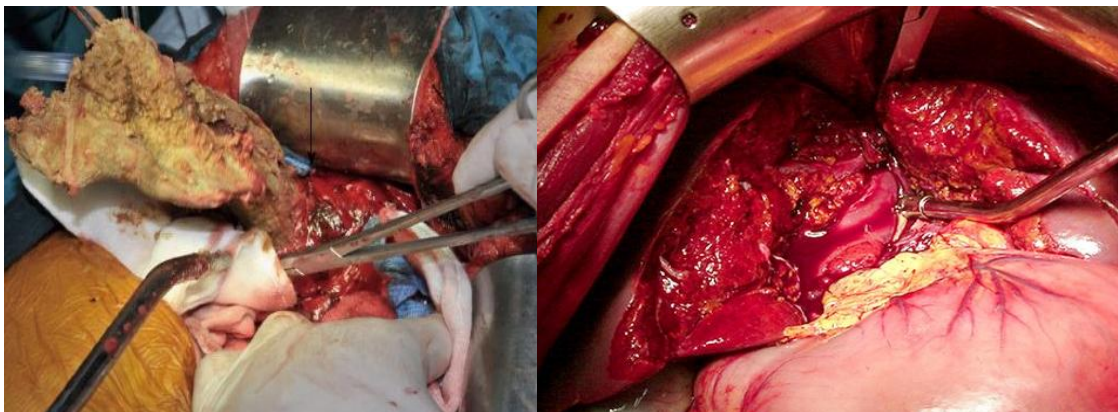


Fig 3:Pei-hepatic packing

Fig 4:Resectional debridement

IV. Discussion

This is prospective study of 50 patients done during a time span of 28 months from June 2012 to October 2014.

Liver Trauma Incidence

22.3% of abdominal trauma resulted in liver injury.

Age incidence

42% of patients (21/50) presented to us are in the age group of 21-30 years and 28% (14/50) of patients are in the age group 11-20 years.

The most affected population are in the age group 21-30 (21 patients).

Similar results were found in study done by **chiennlc et al**(2013) .

In **Gackowski et al** also series the mean age of presentation is 35.3 years and in study by

WagihMommtazGhnnam et al the mean age was 37 years.

Those patients who were in younger group had good outcome.

Death rate among > 40 years age group was higher than age group of <40 years and the difference was statistically significantly (P= 0.0007) at 95% confidence interval. Similar results were found in studies done by **chienn et al**(2013), Such results may be due to better general health condition of young patients and their ability to heal and mobilize early

Grades of injury

In our study, grade I and II comprised 56% (28/50) of injuries and did not contribute to any mortality. Grade III injuries comprised of 24%(12/50) injuries and contributed to 25%(2/8) of mortality.

Grade IV injuries comprised of 16%(8/50) injuries and contributed to 65%(5/8) of mortality. Grade V injuries comprised of 2%(1/50) injuries and was managed conservatively and survived. Grade VI injury was seen in 2%(1/50) and patient died.

According to **Bajec DD et al** mortality rate was low in grade I, II, III when compared to higher grades.

Grade I, II and III had good out come and grades IV, VI contributed to much of the mortality. (P= 0.0025).

According to **kozar RA et al** more complications are noted in high grade liver injuries. A Study done by **StarvosGoungiotis et al** concluded that 57% of liver injuries were low grade and 43% are of high grade.

Management:

In our study only 20% of total patients were managed non-operatively, in contrast other studies like **StarvosGourgiotis et al** and **Krishtain et al** were 43.2% and 39.77% of total sample were managed non operatively.

The reasons for this could be that 54% of our sample are hemodynamically unstable requiring operative management. Presence of other associated injuries and complications would have contributed to such need and also urs being a government apex hospital draws the more severe injuries or those referred from other hospitals when faced with difficulty in managing conservatively at peripheral level.

Operative

40/50 (80%) of the sample was operated.

Hepatorrhaphy with & without abgel, Perihepatic packing and Resectional debridement were the different surgical techniques used in our sample as means of operative management. 92.5% (37/40) of patients underwent Hepatorrhaphy with or without gel foam augmentation for surgical hemostasis. Peri-hepatic packing is used in 12.5% (5/40) of patients of which 80% died. 2 patients underwent resectional debridement and both died with 100% mortality.

Damage control surgery is preferred over anatomical resection according to **Nasim Ahmed et al** and **SA Badger et al** due to increased mortality associated with resectional techniques.

In studies by **OsamaHegazy et al** and **WagihMommtazGhnam et al** similar techniques were used for operative management. Hepatorrhaphy was the major surgical technique devised in all the above studies.

Re-exploration

Re-exploration is done in 6% (3/50) of the patients. Out of which 4%(2/50) patients pack retrieval was done and resectional debridement is done in 2% (1/50) of the Patients to remove the devitalized tissue.

V. Conclusions

The incidence of Liver Trauma is 22.3% in Osmania General Hospital. The most common age group involved in the injury are younger age group (21-40 years) younger patients had good prognosis.

Preoperative ultrasound scan is useful tool for evaluating Liver injury. CT scan is still the diagnostic tool for evaluating liver injury. Midline incision is sufficient for maximum number of patients in the management of Liver injury.

Grade I and Grade II Liver injuries are the common injuries presented with(56%). Patients with Liver injury Grade I,II and III had better prognosis($P<0.00025$). Patients with Grade V and Grade VI Liver injuries had 50% mortality. Segments V of Right Lobe of Liver is commonly involved in Liver injury followed by Segments VII and VIII. In patients kept on conservative management were monitored for pulse rate, blood pressure, urine output, fever, respiratory rate etc.

Preferred surgical technique for inaccessible bleeding within a laceration is rapid finger fracture hepatotomy and direct suture ligation. Resectional debridement is done when there is unviable parenchyma. Hepatorrhaphy and Hepatorrhaphy with abgel augmentation is sufficient to manage the Liver injury.

Peri-hepatic packing is having a definite role in managing Grade III,IV and V liver lacerations and vascular injuries and all patients should be re explored. After peri-hepatic packing, patients were managed with resectional debridement on Re-exploration. When there is no active bleeding from Liver injury site no intervention is done. Re exploration has to be done within 48 hours of peri-hepatic packing and the patient should be given 3rd Generation Cephalosporin coverage throughout this period.

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