

Operative Management in Liver Trauma

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ABSTRACT

Aim: In accordance to the American Association for Surgery Trauma (AAST) grades of liver Injuries selection of an appropriate surgical technique to control hemorrhage, minimize postoperative Complications and mortality.

Study design: It is a descriptive study.

Place and Duration: This study is carried out prospectively in Mayo Hospital Lahore affiliated with King Edward Medical University and in Kampala International University Teaching Hospital (KIU-TH) Ishaka, Uganda. The study was conducted in 3 years time from 1st December 2010 to 1st December 2011 and then from 1st January 2012 to 1st January 2014.

Sample size: Study was conducted on 30 patients of liver trauma.

Results: Hepatorraphy alone was sufficient in 14 patients (46.66%), in 11 patients (36.66%) hepatorraphy was combined with perihepatic packing, 2 patients (6.66%) were managed by perihepatic packing alone while 2 patient (6.66%) with advance liver trauma right hepatic artery was ligated. 1 patient (3.33%) underwent left Lobectomy.

Conclusion: In liver trauma both blunt and penetrating the major cause of mortality is bleeding and delay in treatment. The decision of operation depends on the hemodynamic status of the patient not on the grade of injury. Hepatorraphy alone can be effective in grade I and II liver injuries, while in advance liver injuries it was observed that suture hepatorraphy combined with peri hepatic packing, Pringle's maneuver and specific hepatic artery ligation were effective in controlling Hemorrhage.

Keywords: Liver trauma, periheptic packing, hepatorraphy, Lobectomy, grades of liver injury, complications of liver trauma, specific hepatic artery ligation.

INTRODUCTION

Liver is the largest organ in the body and it's commonly injured in both blunt and penetrating abdominal injuries¹. Liver is located anteriorly in the abdomen and due to its fragile parenchyma and thin capsule makes it vulnerable to injuries². Liver is usually compressed between the impacting force, rib cage and vertebral column³. The introduction of fire arm weapons and high speed automobiles the liver injuries have increased markedly worldwide⁴. Between 50 to 80% of liver injuries bleeding stops spontaneously so, coupled with good imaging techniques has led to the acceptance of non-operative management⁵. The management of liver trauma has developed over last 20 years and it's learned that hemodynamic stability not the grade of liver injury is the most important factor to determine the management of liver injuries². The other indications for operative intervention include shock on admission, associate injuries, and transfusion of more than 3-4 units of blood, hemodynamic instability and signs of peritonitis¹. Severe injury grade and

Delayed treatment is important factors leading to mortality in liver injuries⁶. The main objective of treatment of liver trauma is early control of bleeding and prevention of ischemia and sepsis⁷. Damage control principals i.e., packing, resuscitation ICU management and then definitive management after 24-48 hours has decreased the mortality in advance liver injuries⁸. The other operative techniques are hepatorraphy, direct suture ligation, resection debridement, anatomical resection, specific hepatic artery ligation, mesh wrapping, and omental packing in complex more complex liver injuries involving major veins i.e., inferior vena cava and juxta hepatic veins other specialized techniques like atriocaval shunt, veno-veno bypass and moore-philer balloon are used⁹.

MATERIALS AND METHODS

It is a prospective study carried out in Mayo Hospital Lahore affiliated with King Edward Medical University, Lahore. The study was conducted in 3 years time from 1st December 2010 to 1st December 2011 and then from 1st January 2012 to 1st January 2014 in the Department of Surgery, Kampala International University Teaching Hospital (KIU-TH) Ishaka, Uganda. Thirty patients were included in the study. All patients of liver injuries presenting in Accident and

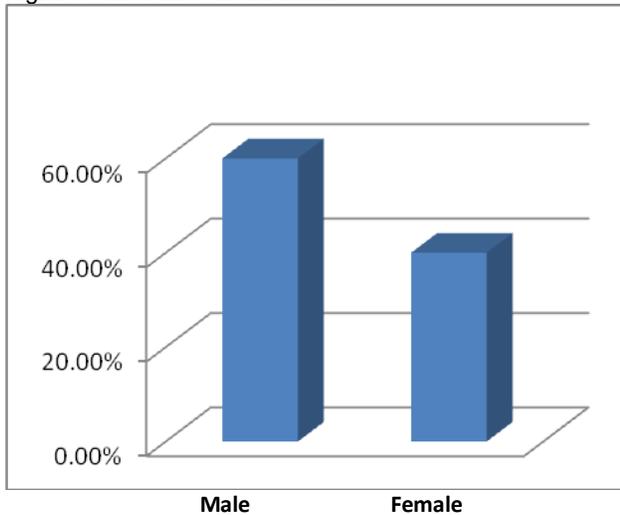
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Emergency (A&E) Department with definitive indication for exploratory laparotomy i.e. hemodynamic instability, altered conscious level, refractory hypotension, need for transfusion of more than 3-4 pints, associated injuries, and hemoperitonuem of more than 500mls and retroperitoneal hematoma were included in the study. Liver injuries were graded according to American Association for Surgery Trauma (AAST). The data was collected on two preformed Proformas containing the particulars of the patient, mode and time of injury, vitals at the time of presentation, details of physical examination, resuscitation measures, grades of liver injuries, operative details and recording of post operative events for next 3 months.

RESULTS

The study was conducted on 30 patients, 20 patients were included from Mayo Hospital Lahore and 10 patients of liver injuries were included from KIUTH, Ishaka. 25 patients were males (83.33%) and 5 patients (16.66%) were females (Fig.1). Most of the patients were young and the mean age of the patients was 31.73. In 18 patients (60%) the mode of injury was blunt abdominal trauma and 12 patients (40%) suffered from penetrating injuries (Fig. 2)

Fig.1: Gender wise distribution:



The severity of the liver injuries was assessed in accordance with the AAST grading system it was observed that 2 patients (6.66%) had grade I liver injury while 17 patients (56.6%) were in grade II to grade III, grade IV to grade V were 11 patients (36%). Operative techniques were chosen according to the severity of liver injuries assessed by the AAST grading system. (Fig.3)

Fig. 2: Mode of injuries

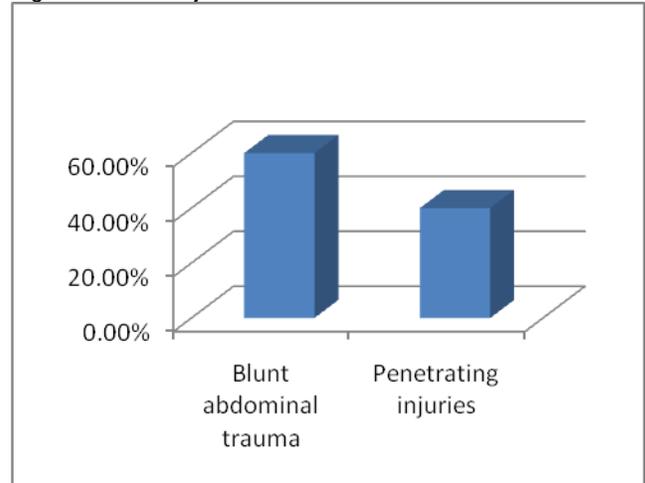
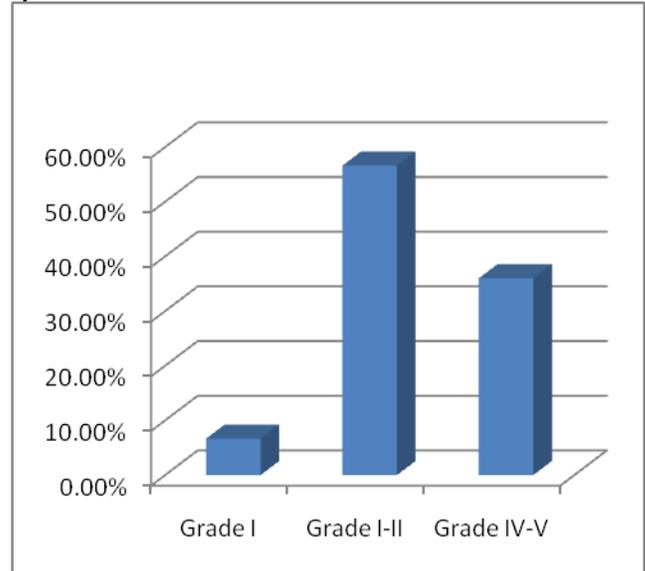


Fig. 3: Severity of liver injuries according to AAST grading system



Hepatorraphy alone was sufficient in 14 patients (46.66%), in 11 patients (36.66%) hepatorraphy was combined with perihepatic packing in order to secure Hemostasis and were re explored after 48 hours to remove the packs and it was observed that in all patients Hemostasis was achieved, 2 patients (6.66%) were managed by perihepatic packing alone as a measure of damage control, they were optimized in ICU and then were re explored after 48-72 hours, packs were removed, minimal debridement was done bleeding blood vessels and the bile ducts were isolated and tied, hepatorraphy was done and abdomen was closed over a drain. 02 patient (6.66%) who had advance liver trauma in order to control Hemorrhage after Pringle's maneuver the right

hepatic artery was ligated and then hepatorrhaphy was combined with perihepatic packing which were removed after 48 hours. 01 patient (3.33%) underwent left Lobectomy.

Sepsis was the most common post operative complications seen in 10 patients (33.33%) with liver injuries, jaundice was seen in 7 patients (23.33%), 3 patients (10%) developed biloma, 2 patients (6.66%) had biliray fistulas, Hemobilia was seen in 1 patient (3.33%) and 3 patients (10%) had coagulopathies postoperatively. 4 patients (13.33%) died post-operatively.

DISCUSSION

This study was conducted on 30 patients and the mean age of the patients observed was 31.73, Asfar S, Khusheed M et al¹⁰ studied 117 patients of liver trauma and in his study the mean age of the patients was 29 years so, most of the victims were young. The majority of the patients i.e., 25 were males (83.33%) and 5 patients (16.66%) were females, Timofle D et al¹¹ in his study had the similar observation in which the male patients of liver injuries were almost 71.22% and females were 28.57%. 18 patients (60%) had blunt abdominal trauma while 12 patients (40%) suffered from penetrating injuries, Parks RW et al⁹ studied patients of liver trauma at Mater Hospital Belfast and had similar findings that blunt liver injuries worldwide were common than penetrating injuries he observed that in Europe it was almost 80.90% while in south Africa it was 66% and in north America it was 88%.

The severity of the liver injuries in this study were assessed by using ASST grading system it was observed that majority of the patients 56.6% were in grade II to grade III, while in grade IV to grade V were patients 36% and 6.66% patients had grade I liver injury, Lin BC et al¹² in a study of 58 liver trauma patients made an observation that 76% of the liver trauma patients were in grade III to Grade IV and 24% were in Grade V, Ma XL⁶ et al also concluded in his study that 51.7% of the patients of liver injury had grade III or more liver injury so; it's seen that most of the liver injuries are in an advance grade at the time of presentation.

Hepatorrhaphy alone was sufficient in 14 patients (46.66%) while in 11 patients (36.66%) hepatorrhaphy was combined with perihepatic packing, 2 patients (6.66%) were managed by perihepatic packing alone and 2 patient (6.66%) with advance liver trauma had right hepatic artery ligated. 1 patient (3.33%) underwent left Lobectomy, Awad et al¹³ studied 52 liver trauma patients at University of Alexandria Egypt and remarked that in 57.7% of the patients simple

suturing was sufficient and liver resection were required in 3.8% of the patients, specific hepatic artery ligation was done in 15.4% patients and packing alone was done in 7% of the patients while Marr JDF et al¹⁴ studied 153 gunshot liver injuries in Cape Town University and noted that in 30% of the patients suturing was sufficient, 23% required packing. Celebi F et al¹⁵ observed 174 liver trauma patients and made a conclusion that 60% of the patients required only hepatorrhaphy and perihepatic packing in 2.3% of the patients while specific hepatic artery ligation was done in 1.1% of the patients. Mortality was seen in 4 patients (13.33%) post operatively, Yaman I et al¹⁶ al in his study of 53 patients also observed the mortality rate of 14.6%.

REFERENCES

1. Chuschieri SA. Disorders of the liver. In: Essential Surgical Practice. 5th edition. New York: 2015; 616-70
2. Nasim A, Jerome JV. J emerg trauma shock 2011; Jan-March 4(1):114-19
3. Rahul SK. The Liver. Bailey and Love's Short Practice of Surgery 26th edition. London: 2013; 1065-86
4. Carillo EH, Platz A et al. Non Operative management of blunt hepatic trauma. BJ Surg 1998; 461-68
5. Pachter HL and Hofstetter SR. The current status of non-operative management of blunt hepatic injuries. Am J Surg. 1995; 169; 442-54
6. Max XL, Jiang YG et al. chin Truamotol 2004 Feb; 7(1): 28-31
7. Tai NR, Boffard KD et al. A 10 years experience of complex liver injuries. BJ Surg 2002; 89: 1532-37
8. Janniffer A, Leinicke and Douglas JE. Trauma surgery. Washington Manual of Surgery 6th edition. Philadelphia: 2012; 495-534
9. Parks RW, Chrysos C et al. Management of liver trauma. BJ Surg 1999; 86: 1121-35.
10. Asfar S, Khursheed M et al. Management of liver trauma in Kuwait. Med Prin Pract 2014; 23(2): 160-66
11. Timofte et al. Management of traumatic liver lesions. Rev Med Chir 2015; April-June 119 (2): 431-36
12. Lin BC et al. Surgical management and outcome of blunt liver injuries: experience of damage control laparotomy in one trauma center. inj 2014; 45(1): 122-27
13. Awad AT, El Hammadi et al. Hepatic injuries: management and outcome. Int Surg 1999; July-Sept 84: 266-70
14. Marr JDF et al. Analysis of 153 gunshot wounds of liver. BJ surg 2000; 87: 1030-1034
15. Celebi F et al. Hepatic Injuries: surgical treatment experience. TJ trauma. 2001; 7(3): 185-88
16. Yamman I et al. Surgical treatment of hepatic injuries: morbidity and mortality analysis of 109 cases. gastroenterology 2007; 54(77): 1507-11.

