



Original Article

Causes and Management of Blunt Liver Trauma in a Tertiary Care Hospital in Peshawar

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ABSTRACT

Trauma is the principal reason of deaths in kids and young adults globally. **Objective:** To determine the causes and management of blunt liver trauma in a tertiary care hospital in Peshawar. **Methods:** The present investigation observed a total of 150 individuals through non-probability consecutive sampling to determine the mean hospital stay in patients presented with blunt liver trauma. **Results:** In this study, age distribution among 150 patients was analyzed as n=10-20 Years 51 (34.0%), 21-30 Years 35 (23.3%), 31-40 Years 16 (10.7%), 41-50 Years 23 (15.3%), 51-60 Years 25 (16.7%). Mean age was 41.56±5.357 years. Gender wise Distribution among 150 Patients was analyzed as Male were 94 (62.7%) and female were 56 (37.3%) Distribution of BMI among 150 patients were analyzed as n=Below 18.5 Underweight 76 (50.7%), 18.5-24.9 Normal weight 35 (23.3%), 25.0-29.9 pre-obesity 21 (14.0%), 30.0-34.9 Obesity class 18 (12.0%). Distribution Mechanism of Injury among 150 patients were analyzed as n= RTA was 57 (38.0%), fall from height was 52 (34.7%), Sport's injury was 18 (12.0%), physical assault was 23 (15.3%). Successful Conservative Management among 150 patients were analyzed as n= Yes was 106 (70.7%) and No was 44 (29.3%), Distribution of Mortality among 150 patients were analyzed as n= Yes was found 66 (44.0%) and No was found 84 (56.0%). **Conclusions:** The severity of liver damage and concomitant intra-abdominal injuries demonstrated a strong association with the chance of success with conservative therapy. The restricted hospital facilities and lack of agreement on traditional therapy had a detrimental influence on success.

INTRODUCTION

Trauma is the principal reason of deaths in kids and young adults globally. According to World Health Organization (WHO), trauma claimed an estimated 5 million lives in the year 2016 with a majority (20-25%) resulting from road traffic accidents (RTA). Approximately 6% of all deaths in Pakistan are caused by trauma [1, 2]. The most frequent damaged solid organ in acute abdominal trauma is the liver, which accounts for up to 38% of cases. The common

mechanisms of injury include RTA, falls from height, and assault. Blunt hepatic trauma constitutes 75-90% all cases of liver injury. The mortality rate from liver trauma might reach 12.2% [3]. Over the last three decades, the introduction of advanced radiological diagnostic techniques such as computed tomography (CT) scans has led to a better knowledge and evaluation of liver damage, revolutionizing the practice of trauma surgery [4, 5].

According to the recently published guidelines from the World Society of Emergency Surgery (WSES) in March 2020, conservative management was the recommended treatment modality of choice in blunt hepatic injuries in hemo-dynamically stable patients while surgery was reserved for hemo-dynamically unstable patients [6]. The major advantages of non-operative management (NOM) is the circumvention of a major surgical procedure that is associated with its own risks and complications in addition to the increased burden on healthcare and increased financial costs. Surgery also leads to a delayed return to work and delayed recovery of patients with increased hospital stay [6, 7]. Conservative management of blunt liver trauma should be planned on the basis of findings of meticulous clinical examination and radiological investigations. A multidisciplinary approach ensures the best outcome. Aim of this study was to find the wide disparity in the reported literature on the accomplishment of conservative management of blunt liver trauma. Moreover, few Pakistani studies have focused on the NOM of liver trauma. Avoidance of surgery in a patient not only benefits the patients physically, and physiologically. The findings of this investigation will contribute to the validation of conservative care of blunt liver damage as a safe and effective therapeutic strategy, ultimately leading to better patient management.

METHODS

It was a Descriptive cross-sectional study carried out at Department of General Surgery, Hayatabad Medical Complex Peshawar. The duration of the study was from 7th May 2021 to 7th November 2021. Sample size of 150 were calculated using the WHO formula for "Estimating sample size for a population average with the following assumptions:

Length of hospital stay: 7.72 ± 4.818

Confidence Level: 95%

Relative precision: 10%

It was a non-probability consecutive sampling. All those individuals of either gender who were diagnosed as cases of blunt liver trauma (level I & II) as per operational definition of age between 10 to 60 years of ASA Class I, II and had BMI 19-30 Kg/m² and were hemodynamically stable at the time of presentation were included in the study whereas, patients who had penetrating abdominal trauma, polytrauma having injury to other parts of body as well like head injury, fractures, chronic liver disease, ischemic heart disease and with identified history of coagulation disorders were excluded. A total of 150 patients presenting to the Accident and Emergency (A&E) Department of Hayatabad Medical Complex, Peshawar with blunt, abdominal trauma who met the inclusion and exclusion criterion were

enrolled. All patients participating in the trial provided informed consent. All the patients were managed according to the Advanced Trauma Life Support (ATLS) protocol Primary and Secondary surveys were completed. Demographic particulars including age, gender, profession contact number and address were documented. History was taken in detail with record of the exact mechanism of injury and time since injury. A thorough examination was performed, as well as baseline laboratory examinations such as CBC, blood group and cross match, renal function tests, coagulation profile, liver function tests, and Hepatitis B and C serology. Following X-rays of the chest, cervical spine, and pelvis, a Focused Assessment with Sonography for Trauma (FAST) scan was accomplished to search for any indication of free fluid in the abdomen and pelvis. Radiologist requested to comment on any liver trauma if present. Patients were admitted to the surgical critical care unit (ICU) and monitored. Once hemodynamically stabilized, an abdominal contrast enhanced computed tomography (CECT) scan was required. The Liver injury were classified as per the American Association for Surgery of Trauma (AAST) scale into levels I-VI. Non-operative conservative treatment was planned and patients would be monitored for any hemodynamic instability, and fall in hemoglobin (Hb) levels. Serial Hb levels were done daily. Any patient suffering from severe pain, hemodynamic instability and a sudden fall in Hb levels were taken to Operation Theater (OT) for laparotomy. Conservative management were labelled as successful if the patient improves without surgery after a period of careful observation and is discharged. Data of all patients were recorded on a pre-designed proforma. Data were inserted into MS Excel and analyzed with SPSS version 25. Average and standard deviation were measured for the quantitative variable such as age, BMI, time of presentation and duration of hospital stay. Qualitative variable like gender, ASA class, and mechanism of injury, severity of injury, treatment outcome, and mortality were expressed as frequency and percentages.

RESULTS

In this study age distribution among 150 patients was analyzed as n= 10-20 Years 51 (34.0%), 21-30 Years 35 (23.3%), 31-40 Years 16 (10.7%), 41-50 Years 23 (15.3%), 51-60 Years 25 (16.7%). Mean age was 41.56 ± 5.357 years. Gender wise Distribution among 150 Patients was analyzed as Male were 94 (62.7%) and female were 56 (37.3%). Distribution of BMI among 150 patients were analyzed as n=Below 18.5 Underweight 76 (50.7%), 18.5-24.9 Normal weight 35 (23.3%), 25.0-29.9 pre-obesity 21 (14.0%), 30.0-34.9 Obesity class 18 (12.0%). Distribution Mechanism of Injury among 150 patients were analyzed as n=RTA was 57 (38.0%)

Fall from height was 52 (34.7%) Sport's injury was 18 (12.0%) physical assault was 23 (15.3%) (Table 2). Successful Conservative Management among 150 patients were analyzed as n= Yes was 106 (70.7%) and No was 44 (29.3%). Distribution of Mortality among 150 patients were analyzed as n= Yes was found 66 (44.0%) and No was found 84 (56.0%).

Age	Frequency (%)
10-20 years	51 (34.0%)
21-30 years	35 (23.3%)
31-40 years	16 (10.7%)
41-50 years	23 (15.3%)
51-60 years	25 (16.7%)
Mean \pm SD	41.56 \pm 5.357
Mortality	
Yes	66 (44.0%)
No	84 (56.0%)

Table 1: Age Demographics

Mechanism of Injury	Frequency (%)
RTA	57 (38%)
Fall from height	52 (34.7%)
Sports injury	18 (12%)
Physical assault	23 (15.3%)
Total	150 (100%)

Table 2: Distribution Mechanism of Injury

DISCUSSION

According to Jin et al., liver damage happened in twenty percent of individuals with rounded abdominal trauma [8]. Our study discovered a ratio between male/female is 5:1. Kutcher et al., discovered that the ratio towards male to female lies between 15:1 [9]. Nearly 15-20 years ago, all severe liver wounds were handled surgically, although no active bleeding was discovered in 50-80% of instances [10, 11]. For related injuries, our study also discovered liver wounds without current bleeding throughout laparotomy. The hemodynamic state was the primary factor in deciding the therapy method in our investigation. According to the findings of our study, roughly eighty five percent of individuals with rounded liver injuries are hemodynamically stable or stabilize after getting intravenous fluids [12]. According to Stassen et al., many competent trauma surgeons use surgical therapy in hemodynamically stable individuals and have resolute that traditional handling has a good influence on patient endurance [13]. A helical CT scan with oral and venous contrast was conducted in hemodynamically stable patients to identify the severity of the liver disorders, the quantity of hemoperitoneum, the existence of pseudoaneurysms, and other intraperitoneal

lesions. Repeated ultrasound exams revealed hemoperitoneum, and in some cases, a CT scan was used to confirm the diagnosis. According to Udobi et al., a substantial amount of hemoperitoneum (perihepatic space, Douglas pouch, and blood in the lateral channels) is a major risk feature for conservative therapy failure [14]. Because of the limited transfusion resources at our institution, we discontinued conservative therapy in patients who had a high need for transfusion and whose hemoperitoneum was steadily expanding. Fifteen individuals in Group A of 88 individuals chosen for conservative therapy had problems that required surgery. Group B included 85 individuals who had an urgent laparotomy because of hemodynamic variability, concomitant intra-abdominal wounds, or piercing trauma. It is interesting to note that a case of piercing liver damage induced by shooting rifle injuries were handled cautiously. Ten individuals had perihepatic packing; six of them required a second laparotomy, and four did not live. Our study discovered that bullet injuries and wounds due to sharp instruments occurred at a rate of 24.8%. This proportion was considerable, and took part in a decrease in the number of conservatively managed patients. Gunfire victims were penetrating in 35-70% of cases, whereas sharp tool injuries were not penetrating in 35-61% of instances [15-17]. Another useful procedure for determining the presence or type of intraperitoneal fluid is diagnostic peritoneal lavage (DPL). We utilized this method in some instances. DPL, as defined by Root in 1965, relies a significant tool in surgeons' hands, particularly in the nonattendance of noninvasive technology. For intraperitoneal injuries, DPL has extreme sensitivity and specificity rate of ninety five and ninety nine percent, respectively. But this technique is linked to issues in 0.8-1.7% of instances [18]. According to our findings, conservative therapy was positive in 42.2% of individuals with mixed hepatic damage and 58.7% of individuals with solitary hepatic trauma. These proportions found in our research are smaller than those seen elsewhere. These disparities, in our opinion, are due to two reasons: (1) a lack of agreement for conventional care and other (2) restricted hospital facilities (limited interventional radiology procedures). Traditional therapy was unsuccessful in 17.2% of patients. According to certain studies, the effectiveness of traditional care of liver suffering in hemodynamically stable individuals is around eighty-seven and ninety eight percent and an unsuccessful rate of 10 to 25% [19, 20]. Wounds of level III or higher contributed significantly to unsuccessful of cautious care. We only had two individuals with level IV liver damage who were treated predictably. According to Udobi et al., conservative therapy was unsuccessful in 14% of individuals with level IV wounds and

22.6% of individuals with level V wounds, whereas the failure rate in individuals with levels I, II, and III injuries was 3-7 and 5%, respectively [14]. The severity of liver damage has a substantial link with the chance of effectiveness of conservative therapy. 2.6 was recorded as the coefficient of level damage, implying that as level of injury grows, the likelihood of conservative therapy being effective reduces to 2.6. Furthermore, the efficacy of conservative therapy was significantly related to accompanying intra-abdominal injuries. Other variables in the effectiveness of the conservative therapy were statistically negligible. The conservative treatment's failure was frequently linked to worsening of hemodynamic parameters, bile outflow, and the existence of overlying septic sequelae. Secondary bleeding occurs in fewer than 5% of patients managed conservatively, according to Knudson et al., and Yamamoto et al., [21, 22]. We discovered that conservative therapy failed in 3% of instances due to subsequent bleeding. According to Richards et al., and Ma et al., bile spillage can occur in 3-20% of patients who are treated cautiously [23, 24]. Only one patient in our research required surgical intervention as a result of elevated ALT and AST levels. Conservative therapy failure rates owing to connected intra-abdominal damages have been testified to fluctuate between 0.5 to 3.5%, while in our findings, the unsuccessful rate with related intra-abdominal injuries was 2.3%.

CONCLUSIONS

The severity of liver damage and concomitant intra-abdominal wounds demonstrated a strong association with the chance of success with conservative therapy. The restricted hospital facilities and lack of agreement on traditional therapy had a detrimental influence on success.

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