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Original article

14 Non operative vs operative management of blunt hepatic injury: A Retrospective Study authors Dr Shaishav V Patel , Dr Kalpit Suthar, Dr sandeepkumar singh,

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Abstract

The liver is one of the most frequently damaged organs and remains the most common cause of death following blunt abdominal trauma. During the last century, the management of blunt force trauma to the liver has changed from observation and expectant management in the early part of the 1900s to mainly operative intervention, to the current practice of selective operative and non operative management. Currently, a non operative management constitutes the treatment of choice in patients with hemodynamic stability.The objective of this study is to examine the outcomes of blunt hepatic trauma, and compare surgical and nonsurgical treatment on patients admitted with hemodynamic stability and with no obvious indications of laparotomy.

Methods: A retrospective study of the patients presented with blunt liver trauma was performed from 2016-2017.Variables analyzed included demographic data, cause of injury, grade of injury, associated injuries, vitals, haemoglobin values,number of blood transfusion, mode of treatment and complications. Clinical parameters, GCS were recorded in all the patients. ultrasonography and CT scan were also done. Patients with unstable hemodynamics who responded to fluid challenge and with stable hemodynamics were included in conservative management of liver trauma.**Results:** A total of 55 patients were analyzed. 5 patients had sustained severe injuries. Mean pulse rate in conservative group was 92 beats/min.Mean blood pressure in conservative group was 110/70 mmHg . Conservative treatment was followed in 50 patients with surgery undertaken in 6 of the patients from this group due to failure of conservative treatment. Mean duration of hospital stay in conservative and operative groups are respectively 17 and 19 days. P value is significant (0.04).**Conclusions:** A non-operative approach results in lower complications, a lesser need for blood transfusions and a lower mortality rate. Failure of conservative treatment did not show a higher incidence of complications or mortality.

Introduction

Liver and spleen together, account for 75% of injuries in blunt abdominal trauma. Though liver is the second most commonly injured organ in abdominal trauma; it is the most common cause of death following abdominal injury. The liver is although protected under the rib cage but , The large size of the liver, the friable parenchyma, its thin capsule and its relatively fixed position make it prone to blunt injury. Right lobe is more often involved, owing to its larger size and proximity to the ribs [1,2]. Compared to splenic injuries, management of liver trauma still remains a challenge in the best of trauma centres [3,4].Initially in seventies, these patients with blunt hepatic trauma were explored immediately irrespective of hemodynamics and associated hollow viscus injuries [5]. The surgical exploration in blunt hepatic trauma can prove to be futile as active bleeding stops in about 86% of patients [6]. During the last century, the management of blunt force trauma to the liver has changed from observation and expectant management in the early part of the 1900s to operative intervention, to the current practice of selective operative and nonoperative management.Haemorrhage from a liver laceration is often self-limiting, and uncomplicated healing can occur even in relatively major liver trauma. Intervention is indicated when haemorrhage is excessive, fails to cease spontaneously, or a CT scan demonstrates an expanding central haematoma with arterial bleeding. This latter injury is unsuitable for conservative management, even if the patient is haemodynamically stable, as the expanding haematoma continues to destroy the surrounding normal liver, and eventually ruptures intraperitoneally.The advent of new diagnostic technologies in recent years, such as Computed Tomography (CT), hasallowed a paradigm shift from surgical treatment to nonsurgical treatment for selected patients. The use of CT for patients with blunt abdominal trauma determines the presence of a liver injury and its organ injury scale, and excludes other significant lesions, avoiding unnecessary surgery [6-9]. Imaging techniques especially Computerised Tomographic (CT) scan has created remarkable impact in managing liver trauma patients by reducing the number of laparotomies. About 80% of adults and 97% of children are presently managed conservatively worldwide at high volume trauma centres [10,11].With the ultrasound, FAST (focused assessment by sonography of trauma) became a standard investigation for detection of hemoperitoneum in equivocal cases[12]. The use of CT for patients with blunt abdominal trauma determines the presence of a liver injury and its organ injury scale, and excludes other significant lesions, avoiding unnecessary surgery [6-9].The further introduction of contrast CT it was possible to classify liver injuries. Motor vehicle accidents are the most common cause of blunt hepatic trauma. These high speed accidents produce tear of III-IV segments at the level of hepatic ligament mostly causing minor grade I-III tears.[13]

Materials and Methods

In all the patients admitted with blunt abdominal trauma or poly trauma a detailed history was taken regarding age, sex, duration and mechanism of injury. The examination of pulse rate, blood pressure, sPo2 and associated injuries was done.All patients were examined by

ultrasonography. The presence of blood in peritoneum and hepatic trauma was the first criteria for inclusion in this study. The diagnostic peritoneal lavage (DPL) was not done in any of the patients instead computerized tomography (CT scan) was done in most of the patients.To analyze the results the patients were divided into two groups, Group A: non operative treatment; Group B : operative treatment. The decision as to which treatment to apply depended on the surgeon, with conservative treatment being implemented in patients fulfilling the following criteria:a) Hemodynamic stability or correct response to plasma volume expansion; b) no indication of surgical treatment due of extra and intra abdominal associated injuries, independent of Glasgow coma scale and severity of hepatic injury. Failure of non operative treatment determines that a laprotomy be carried out, after the initial decision to treat the patient non operatively.

We excluded the patients with obvious indication for surgery: hypotension, evidence of peritonitis, vascular lesions, associated lesions in the hollow viscus. We also excluded patients who required a splenectomy.

The following factors were analyzed: age, gender, cause of injury, systolic blood pressure (SBP) on admission, Glasgow Coma Scale (GCS), grade of injury according to the Organ Injury Scale of the American Association for the Surgery of Trauma (OIS-AAST), presence of associated abdominal injuries, need for blood transfusion, amount of packed red blood cells, platelets and fresh frozen plasma transfusions, complications (related and non-related to the liver), need for surgical intervention, length of hospital stay and mortality [14-19].

Those patients having persistent hypotension systolic blood pressure less than 90 mm of Hg and tachycardia pulse rate more than 110 per minute were considered in hemorrhagic shock. The resuscitation was done using a fluid challenge of Ringer's lactate is infused in short period. If there was absent response or transient response to fluid challenge the patient was considered as hemodynamically unstable. Abdominal computed tomography was done in majority of these patients and grading of injury was done The patients who were selected for conservative management were kept under observation. The observation regarding peritoneal signs was continuously done by surgery residents even if the patient was kept in a critical care unit. Timely review was done by consultant into progress of patient. The termination of observation period and operative decision was always taken by consultant. The hematocrit values and other haematological tests were done daily. The observations were made regarding number of blood transfusions. The progress of conservative treatment was done by ultrasound even during follow up visits to rule out any long term complication. All these observations were recorded in patients' record and analyzed.

Results

In this study of 55 patients, 45 were males and 10 were females. The age of these patients ranged from 15 to 65 years of age. The injuries were due to traffic accidents (46)all from height (3), and assault (2), buried under wall collapse (2), other(2).

5 patients with unstable hemdynamics were subjected to operative treatment.
The operative procedures included suturing, omental packing and perihepatic packing. Rests of 50 patients were placed on conservative treatment and were included in the study for further analysis.
The CT findings could grade the liver injury in these patients;
Grade I:

1. haematoma: sub capsular, <10% surface area

2. laceration: capsular tear, <1 cm depth

Grade II:

1. haematoma: sub capsular, 10-50% surface area

2. haematoma: intraparenchymal <10 cm diameter

3. laceration: capsular tear, 1-3 cm depth, <10 cm length

Grade III:

1. haematoma: sub capsular, >50% surface area, or ruptured

with active bleeding

2. haematoma: intraparenchymal >10 cm diameter

3. laceration: capsular tear, >3 cm depth

Grade IV:

1. haematoma : ruptured intraparenchymal with active bleeding

2. laceration : parenchymal disruption involving 25-75% hepatic

lobes or 1-3 Couinaud segments (within one lobe)

Grade V:

1. laceration: parenchymal disruption involving >75% hepatic lobe

or >3 Couinaud segments (within one lobe)

2. vascular: juxtahepatic venous injuries (IVC, major hepatic vein)
We had grade I in (45%), grade II in (30.00%), grade III in (18%) and grade IV in (7%) patients.

Discussion and conclusion

In the last 15 years, the treatment of liver trauma has progressively evolved(4,12).At the begining of 1990's several articles reported the possibility of non surgical treatment in patients witj hemodynamic stability similar to what is carried out by paediatric surgeons in cases of hepatosplenic injuries(9,12).The aim of this type of treatment is to not only decrease the number of non therapeutic laparotomies(13,14) but to also achieve reduction in mortality and morbidity.In this group of patients immediate sirgery is substituted by intial non surgical or conservative management with close monitering.Operative management is indicated in cases of continued hemorrhage or presence of determined underlying lesions.

Therapeutic evolution has become possible thanks to the diffusion of imaging techniques such as abdominal CT Echocardiography which are more rapid,sensitive and specific in the diagnosis of abdominal injuries and have replaced paritoneal lavage because of its low specificity and bad prediction of the need for laprotomy(17) desite its high sensitivity and speed of application.In our case series based on hemodynamic stability patients were subjected for abdominal CT with contrast to provede better knowledge of his liver injury and his further management. In the series published recently, the applicability of conservative treatment in patients with liver injury has varied from 35% to 82% [6,16] according to the year, the selection criteria and the number of patients studied. The two main variables guiding the therapeutic approach were hemodynamic instability and the need for transfusion [19-21]. In our centre conservative treatment was implemented in almost 50% of the cases in the last 5 years with a failure rate of 21%, which is slightly higher than what has been reported in the literature [6]. There are no predictive criteria to allow either the selection of the type of adequate treatment or to predict the failure of conservative treatment. Thus, the application of

conservative treatment in cases of liver trauma obliges the surgeon to perform continuous monitorization of the patient during the first 48 hours and to have adequate infrastructure to allow immediate surgery on observation of clinical deterioration of the patient [7]. During the first years most series limited the cases to non-severe injury (grade ≤ III) [5], restricting the use of conservative treatment to values below 40% of the cases. Later, the good results achieved led to progressive widening of the inclusion criteria.

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