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NONOPERATIVE MANAGEMENT OF BLUNT SPLENIC AND LIVER INJURIES IN ADULT POLYTRAUMA

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ABSTRACT :

Background: Isolated splenic or hepatic injuries are present in approximately 30% of all cases of adult abdominal trauma. Most authors quoted above have limited nonoperative management (NOM) to patients with isolated organ injury. Results of NOM following blunt hepatic and splenic trauma in patients with multiple injuries were evaluated in this study.
Materials and Methods: Retrospective chart review was performed on multiple injured adults with splenic and liver injures resulting from blunt trauma. Associated injuries, clinical signs at presentation, used diagnostic tools, injury grading, transfusion requirements, morbidity and mortality were documented.
Results: Medical records of 275 patients aged from 17 to 81 years with blunt splenic and liver trauma and associated injuries were analyzed. Patients with hemodynamic instability or obvious peritoneal signs were excluded from further study. Surgery was indicated in 106 patients without response or transient response for fluid challenge. 131 of 237(55%) patients were selected for NOM: 78 with splenic, 46 with liver and 7 with injuries to both. 25(19%) patients were older 55 years. The mean injury severity score was 25.2. Injury grade ranged from I-IV and the degree of hemoperitoneum was from mild to severe. 8 patients failed NOM (6%). Mean blood transfusion requirement during first 24 hours at admission was 0.3 units. Morbidity rate was 1.2%. Two patients (1.5%) died following severe head trauma.
Conclusion: Nonoperative strategy is the preferred modality for the care of blunt splenic and liver injuries in the hemodynamically stable patients, irrespective of age, grade of injury, associated injuries or degree of hemoperitoneum.

Keywords: Blunt abdominal trauma, nonoperative management, spleen and liver injury

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INTRODUCTION:

Isolated splenic or hepatic injuries are present in approximately 30% of all cases of adult abdominal trauma.[1],[2] In recent years, following the initial success of Upadhyaya and Simpson with nonoperative management (NOM) of splenic injuries in children,[3] more and more stable patients with blunt splenic injuries are treated nonoperatively with reported success rates of 14-100%.[4]-[9] Recent studies documented successful extension of this approach to the care of hepatic, renal, pancreatic and multiple injuries.[10]-[15]

Increasing use of high quality computed tomographic imaging and its interpretation leads to redefinition of the criteria for NOM of splenic and hepatic injuries.[16]-[18] Most authors quoted above have limited NOM to patients with isolated organ injury. In this paper, we present our experience with NOM of hepatic and splenic injuries in patients with additional extra- and intra-abdominal injuries.

AIM AND OBJECTIVES OF THE STUDY:

To findout effectiveness of Nonoperative Management Of Blunt Splenic And Liver Injuries In Adult Polytrauma.

MATERIALS AND METHODS:

this retrospective chart review, medical records of 275 consecutive adult patients (age over 16 years) with blunt splenic and liver injuries admitted to department of general surgery sree mookmbikai hospital The following variables were recorded: age, gender, mechanism of injury, initial Glasgow Coma Scale score (GCS) and systolic blood pressure, associated injuries, injury severity score (ISS), diagnostic procedures, injury grade, number of units of packed blood cells transfused within the first 24 hours at admission, morbidity and mortality rate.

The diagnosis of hemoperitoneum was confirmed by abdominal ultrasonography, computerized tomography (CT)-scan or by peritoneal lavage (DPL). From 1996, focused abdominal sonography trauma (FAST) has largely replaced DPL in the initial assessment of the blunt trauma victim. Solid organ injuries were classified by using the Organ Injury Scale Committee of the American Association for the Surgery of Trauma standards according the results of abdominal CT-scan and ISS.

Hemodynamically unstable patients and patients with obvious peritoneal signs underwent immediate abdominal exploration and were excluded from further analysis. The signs of hemodynamic instability included: arterial hypotension (systolic pressure lower than 100 mmHg) and/or tachycardia at admission (pulse more than 100 beats per minute). Absence of response or transient response to fluid challenge (1000-2000 ml Ringer's lactate) was indication to operative treatment.

Victims without tachycardia and/or hypotension at admission were concluded as hemodynamically stable. Patients responded to fluid challenge with decreasing in pulse rate and increasing of blood pressure was included in category of stable and was treated nonoperatively. Patients selected for observation were admitted to the intensive care unit for 24-48 hours for continuous serial physical examination, vital signs and serial hematocrit measurement.

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Up to year 1999 a follow-up CT scan was obtained at 72 hours and 10-14 days after admission. The amount of hemoperitoneum was measured as described by Levine *et al* .[17] An attending radiologist and an attending surgeon interpreted all imaging studies. Later CT scan did not affect discharge as it was performed in outpatient department. Since 1999 we changed our radiological follow-up policy and routine CT scan was performed in complicated or clinically needed cases only.

Statistical analysis was done using the statistical package for social sciences (SPSS).Different statistical methods were used as appropriate. Mean ± SD was determined for quantitative data and frequency for categorical variables. The independent t- test was performed on all continuous variables. The normal distribution data was checked before any t-test. The Chi-Square test was used to analyze group difference for categorical variables. A p- value < 0.05 was considered significant

RESULTS:

There were 201 men and 74 women with age range from 17 to 81 years old (mean 38.2 years). 35 patients (13%) were older 55 years. Mechanism of injury was motor vehicle accident in 215(78%) of cases, fall from height in 36(13%), assault in 23(8%) and blast in 1(0.4%).

29 hemodynamically unstable and 9 patients with obvious peritoneal signs were taken immediately to the operating room for exploratory laparotomy and were excluded from further analysis.149 of 237(63%) remaining patients sustained injury to spleen, 61(26%) to liver and 27(11%) to both. GCS score at admission was from 3 to 8 in 39, from 9 to 12 in 19 and from 13 to 15 in 179 patients. Transient response or absence of response to fluid challenge was indication for surgery in 106 patients. Overall 131(55%) patients were selected for NOM. Patients characteristics are summarized in . Age and sex distribution were similar in the two groups, but the NOM patients had a higher GCS score and systolic blood pressure on arrival than the operated group.

78 of 131(60%) patients in NOM group has injured spleen, 46(35%) - liver trauma and 7(5%) - combined trauma of both. These included 25 of 35(71%) patients older 55 years old.

CT grading of splenic and liver injuries is presented in . 6 patients had grade IV splenic injury with flushing of contrast dye on abdominal CT-scan. Assessment of degree of hemoperitoneum on CT-scan revealed small amount of intraabdominal blood in 29, moderate in 41 and severe in 61. Additional associated injuries are listed in .Injury grading in operating patients was unavailable.

Mean transfusion requirement during first 24 hours of admission was 0.3 blood units (range 0-2). Overall 26(20%) patients in NOM group and 94 (89%) in OM group were transfused. In NOM group patients required blood included those with higher injury grade and additional pelvic and long bone fractures. One NOM patient developed an infected intra-hepatic bile collection, which resolved after percutaneous drainage. Two other patients in this group with admission GCS score 3, remained comatose and died later from complications of head injury. All other patients did well. NOM patients had shorter hospital stay. There was no difference in hospital stay after changing CT follow-up policy. Overall morbidity and mortality rate in NOM patients was 1.2% and 1.5% respectively.

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NOM failed in 8(6%) patients. Decreasing hematocrit and requiring more than 4 blood units during the first 24 hours from admission was indication for laparotomy in 4 patients. Delayed diagnosis of diaphragmatic injury in one and pancreatic transection in another case was revealed in second abdominal CT scan performed 24 hours after admission. CT was performed on the morning after clinical suspicion and films revision. Small tear of left diaphragm without dislocation of intraadbominal organs and splenic laceration were found on surgery in first patient. This patient required splenectomy during abdominal exploration and suturing of diaphragm. Distal pancreatectomy and splenectomy was performed in second case. One poor compliance drug abuser underwent splenectomy 48 hours after admission despite hemodynamic stability. Hypovolemic shock at readmission 2 weeks after injury in patient with known grade II splenic injury was indication to splenectomy in other case. A small amount of hemoperitoneum with a healing nonbleeding splenic tear was found during laparotomy. The cause of his worsening was large hemothorax that was treated by thoracal drainage. He was discharged uneventfully after 9 days.

Some authors[10] in 1990-s argued age over 55 years prohibit NOM in splenic or hepatic injuries. However, the data support this argument leave a lot to be desired. With growing experience of NOM in elderly patients different reports[35],[36] conclude that age should not be a criteria for NOM of blunt splenic injuries. Older patients with high-grade injuries and pelvic free fluid are greater risk for NOM failure. Patients with these findings must be monitored closely. Failure of NOM in this population is associated with increased morbidity and mortality.[36] Careful selection of patients older 55 years must be made to minimize morbidity and mortality from failed attempts. At any event, the 25 patients older 55 selected for NOM in the present series were managed successfully.

Currently, the reported failure rates for NOM ranges from 15-25%.[4]- [27] In this series, the failure rate was 6%. This is a result of patient's selection, which is evident by the significantly higher GCS and systolic blood pressure at admission in NOM group. In addition, there were 11(10%) non-therapeutic laparotomies in the OM group. This fact indicates that not all patients who could have been managed nonoperatively were right selected. This is a field for more experience in management of blunt splenic and liver injuries. The use of laparoscopic splenectomy or splenic preservation in stable patients with delayed splenic rupture or NOM failure may be inspecting in future.

CONCLUSION:

We conclude that NOM is safe and effective in selected stable patients with splenic and liver injuries. It appears that neither age, injury grade, perceived amount of intraperitoneal blood, nor associated injuries, are contra-indications to NOM. The most important selection criterion is hemodynamic stability. The indication for conversion from NOM to OM is based on additional injuries detected by subsequent imaging and on hemodynamic criteria, not on physical examination only.

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