Management of Spleen Injury: A One Year Experience from a Tertiary Care Hospital in Nepal

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ABSTRACT

INTRODUCTION: The management of spleen injury has progressed from the era of splenectomy to the era of splenic preservation. This study aims to determine the management approach and outcome following spleen injury in a tertiary care hospital.

METHOD: A retrospective observational study was conducted from June 2015 to May 2016 from hospital records in Department of surgery at National Academy of Medical Sciences (NAMS). The American Association for the Surgery of Trauma Organ Injury Scale (OIS) was used for grading splenic injury. The analysis was done for operative rate, mortality, hospital length of stay and ICU length of stay. Different modalities of treatment and the treatment outcomes were evaluated.

RESULT: There were total of 15 cases of spleen injury. The most common mode of injury was fall from height (66.6%) followed by road traffic accidents (20%) and stab injury (2%). Sixty percent of the cases underwent operative management out of which 55.5% cases had splenectomy, 22.2% cases had splenic repair and 22.2% had repair of associated liver injury. There were 13.3% mortality and 86% recovery without residual morbidity.

CONCLUSION: Most of the cases with spleen injury were managed with favorable outcome. The careful patient selection for non-operative management will result in higher splenic salvage.

KEY WORDS: Injury, Management, Outcome, Spleen.

INTRODUCTION

Abdominal trauma is one of the common causes of preventable trauma related death. The injury to spleen is very common during abdominal trauma. During the past two decades, the management of blunt abdominal solid organ injury has shifted from operative to selective non-operative management.1 Historically the management of splenic injury can be divided into two phases, the period in which splenectomy was the treatment for virtually all spleen injuries and the era of splenic preservation. An autopsy study from Eastern Nepal showed that splenic injury occurred in 21.7% of the total cases of abdominal trauma.2 In Western Nepal, the need of splenectomy in splenic injury due to blunt abdominal trauma was 1.29%.3 In India, 46% cases out of total blunt abdomen trauma with visceral injuries had spleen injury.4 The management of spleen injury varies from splenectomy to spleen preserving procedure. The hemorrhage from traumatically disrupted spleen can be lethal when timely splenectomy may be life saving or injured patients can be treated with spleen salvage procedures and preserve the organ’s immunological function.5,6 The data from the American College of Surgeons National Trauma Data Bank shows that up to 15% of patients with blunt splenic injury will undergo an emergency splenectomy within six hours of admission, due to ongoing bleeding and hemorrhagic shock.7 The remaining patients with blunt splenic injury were considered for non operative management and were managed successfully.
The management of spleen injury has progressed from the era of splenectomy to the era of splenic preservation. The success rates for non-operative management of blunt splenic injury are 95% or higher for pediatric patients and approximately 80% or higher in adults.\(^1\) A feasibility assessment study of non-operative management of blunt abdominal trauma from teaching hospital in Western Nepal showed that the total cases of spleen injury who underwent successful non operative management was 3%.\(^11\)

This study aimed to determine the management approach and outcome following spleen injury in a tertiary care academic hospital.

**METHOD**

A retrospective cross sectional observational study was conducted from June 2015 to May 2016 from hospital records in Department of Surgery at National Academy of Medical Sciences. The secondary data were collected from hospital record and data was entered in Performa designed for the study. The data collected were regarding patient demographics (age and sex), trauma characteristics (mechanisms and mode of trauma, type of management – surgical or conservative) and outcome of injury. The American Association for the Surgery of Trauma Organ Injury Scale (OIS) was used for grading splenic injury. The patients in each grading category were analyzed for operative rate, mortality, hospital length of stay and ICU length of stay. Different modalities of treatment and the treatment outcomes were evaluated. The data were further analyzed for the type of operative interventions adopted for splenic injury. The data was analyzed using Microsoft Office Excel 2007 and SPSS software.

**RESULT**

There were total of 15 cases of spleen injury managed during a period of one year. The mean age of presentation was 39.2 years. The mechanism of injury was blunt in 86% and penetrating in 14%. The mode of injury was fall from height (60%), road traffic accidents (20%), stab (13.3%) and physical assault (6.6%). The clinical presentations were hypovolemic shock (46.6%), abdominal pain (33.3%), left chest pain (13.5%) and loss of consciousness (6.6%). The patients who were hemodynamically stable were continued with conservative approach whereas the hemodynamically unstable patients underwent operative management.

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\begin{array}{|c|c|c|c|c|c|c|}
\hline
\text{OIS grade} & \text{N} & \text{Conservative} & \text{Operative} & \text{Mortality} & \text{LOS (days)} & \text{ICU (days)} \\
\hline
\text{I} & 2 & 50\% & 50\% & 0 & 11 & 4 \\
\text{II} & 0 & - & - & - & - & - \\
\text{III} & 8 & 50\% & 50\% & 1 & 13.6 & 6 \\
\text{IV} & 3 & 66\% & 33\% & 0 & 14 & 5.3 \\
\text{V} & 2 & 0 & 100\% & 0 & 26.5 & 5.5 \\
\text{Total} & 15 & & & & 26.5 & 5.5 \\
\hline
\end{array}
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OIS=Organ Injury Scale, LOS=Length of Stay, ICU= Intensive Care Unit

The length of stay in the hospital was found to be increasing with the increase in OIS grade whereas the length of ICU stay was not found to be increasing substantially with increasing OIS grade. The operative rate for spleen injury was 53.33% out of which 55.5% cases had splenectomy, 22.2% cases had spleen repair and 22.2% had repair of associated liver injury. There were 13.3% mortality and 86% recovery without residual morbidity.

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\begin{array}{|c|c|c|c|c|c|}
\hline
\text{OIS grade} & \text{N} & \text{OR (%)} & \text{Splenectomy} & \text{Splenorrhaphy} & \text{Exploration} \\
\hline
\text{I} & 2 & 50\% & - & - & 1 \\
\text{II} & 0 & - & - & - & - \\
\text{III} & 8 & 50\% & 3 & 1 & - \\
\text{IV} & 3 & 33\% & 1 & - & - \\
\text{V} & 2 & 100\% & 2 & - & - \\
\text{Total} & 15 & & & & \\
\hline
\end{array}
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OIS= Organ Injury Scale, OR=Operative Rate

**DISCUSSION**

The study shows that 50% of the patients with spleen trauma can be managed with non-operative modality in Organ Injury Scale (OIS) grade I to IV whereas 100% of the patients in OIS grade V required operative treatment. The OIS grade V spleen injury requires operative treatment such as splenectomy because the patients present in the state of refractory hemodynamic instability.\(^12\) The immediate operative intervention should be performed for patients with splenic injury who develops hemodynamic instability or substantial blood transfusion due to splenic injury. The OIS grade IV spleen injury can be managed with conservative approach with close monitoring in Intensive Care Unit for any hemodynamic instability. The close monitoring of hemodynamic status in conservative approach and
timely operative intervention in case of hemodynamic unstable patients will lead to favorable outcome in spleen injury.

In splenic injury, there was a significant incremental increase in mortality rate for Grade V injury as compared with lesser grade and LOS and ICU stay also showed incremental increase with increasing OIS grade spleenic injury. In this study, there was no correlation between mortality and higher OIS grade of splenic injury but the LOS was higher with increasing OIS grade. This can be due to small number of patients included in this study.

The non-operative management of blunt spleen injury has increased over time and has acceptable mortality and complications rates in selected patients. Yanar showed that success rates for non-operative management of blunt spleen injury is approximately 80% or higher in adults. In this study the non-operative management was 46.67% in adults. Although this is higher than the success rate of non operative management for spleen injury in a teaching hospital in Western Nepal, this is still low as compared to international scenario. The low rate of non-operative management in this study can be due to lack of specialist trauma surgeons with experience of non-operative modality of treatment in spleen injury. Although splenic injury is a common problem the management decisions vary and single management protocol does not universally apply.

The efforts at splenic preservation could be divided into three different areas: operative attempts at maintaining splenic function; embolization of the splenic artery and its branches; and non-operative management of splenic injury. In this study, the first and third methods were adopted for spleen salvage.

CONCLUSION

Most of the cases with spleen injury were managed with favorable outcome in a central academic hospital with tertiary level care. The careful patient selection for non-operative management will result in high rates of overall splenic salvage.

REFERENCES