

*Case Report*

## Non-operative Management of Splenic Injury

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### ABSTRACT

The most common cause of preventable death after abdominal trauma is missed splenic injury. Blunt injury to the spleen in adults treated by Non-operative Management (NOM) has become the gold standard of care in patients who are haemodynamically stable. The risk of post Splenectomy Infections (PSI) prompted the evolution of preservation of the injured spleen. This modality of conservative treatment for injured spleen was started in paediatric patients. It is highly successful with overall failures rates ranging from 2% to 31% (average 10.8%) with majority of failures occurring in the first 24 hours. Splenic artery embolization is the Current method of NOM of splenic trauma. Here we discuss our experience in managing a female patient of 18years, who presented to the casualty with complaints of diffuse abdominal pain predominantly over left loin following a road traffic accident. Patient was diagnosed to have splenic laceration grade II& hematoma. Patient was managed conservatively by close monitoring and with periodic follow up

**Key Words:** Non-operative Management, Splenic injury

### INTRODUCTION

Approximately 13% of cases of abdominal trauma reporting to emergency department are abdominal organ injuries and of these 60% are splenic injuries. <sup>[1]</sup> The most common cause of preventable death after abdominal trauma is missed splenic injury. <sup>[2]</sup> Clinical presentation of splenic trauma varies widely from fatal hypovolemic shock to asymptomatic. Hence, awareness of this spectrum of presentations and their relative importance is necessary for successful diagnosis and management of splenic injuries. <sup>[3]</sup> Various studies show that the success rate of NOM is improved with interventional angio-embolism; however, several studies documented chances of high rate of complications following angio-embolism. <sup>[4,5]</sup> Often treating surgeon faces dilemma regarding the choice of management. Major changes in the treatment of traumatic

splenic injuries have been seen during the past three decades. In recent times splenic preservation procedures are encouraged because of the fear of increasing susceptibility of patients to infections after splenectomy. Particularly the risk of fatal overwhelming post-splenectomy sepsis <sup>[6]</sup> has motivated trauma physicians towards conservative management of injured spleen. This trend in adult patients is based on experiences in the pediatric setting <sup>[7]</sup> where the non operative management of splenic injuries, with strict bed rest and observation, has already gained acceptance. As a result, in most of the trauma centers, regardless of the severity of the splenic injury, nonoperative management is now believed to be the treatment of choice in hemodynamically stable patients. However, the potential implication of the severity of the injury as a selection criterion remains controversial. Some investigators have

shown increased risk of failed nonoperative management for injuries of higher CT grade [8-10] or if the CT scan reveals contrast extravasation in the splenic parenchyma. [11,12] Here we discuss our experience in managing a 18year old female with splenic injury conservatively.

### CASE REPORT

An 18 year old female patient presented to the casualty with complaints of diffuse abdominal pain more predominantly over the left loin region with history of loss of consciousness for three hours and no history of vomiting and hematuria following a road traffic accident due to collision of auto and a truck. On examination: facial lacerations present over the left side. Per abdominal examination- scaphoid, soft, moving with respiration, no distension, no visible abrasions or contusions, tenderness was present in the left hypochondrium and loin. Vitals were stable with blood pressure ranging from 90/70 to 120/80 mmHg and pulse rate ranging from 90 to 110 bpm. USG abdomen S/o splenic hematoma

measuring approximately 10X4.5X2.7cms and grade II laceration of the splenic parenchyma. Diagnosis confirmed with a CECT abdomen. Routine laboratory investigations were as follows. Hb-9.3G%, Sr Bil-0.8 mg%, Dir-0.2 mg%, ALT-126IU/L, SGPT-25U/l, Screat - 0.6mg%, Bl urea-18mg%, Srelectrolytes-WNL. Patient was managed conservatively with bed rest, IV fluids, IV antibiotics and IV analgesics for seven days. USG abdomen was repeated on the seventh day which showed decrease in hematoma size to 7X2X1.5 and no expansion of existing hematoma and no signs of intra abdominal bleeding Lab reports on seventh day were Hb 9.6 G% without any transfusions, PCV 24 vol%, SrBil 1.0mg%, Facial wounds healed. Patient was discharged. USG abdomen, CECT abdomen and blood investigations were repeated after three months of discharge. Hb-11.3 G%, Sr Bil-0.6mg%, Dir-0.4mg%. Laceration gradually closed by itself and hematoma resolved leaving a residual cavity. There was no abscess formation in the residual cavity.



Fig no-1 Abrasion over Lt loin



Fig no-2 USG abdomen showing hematoma

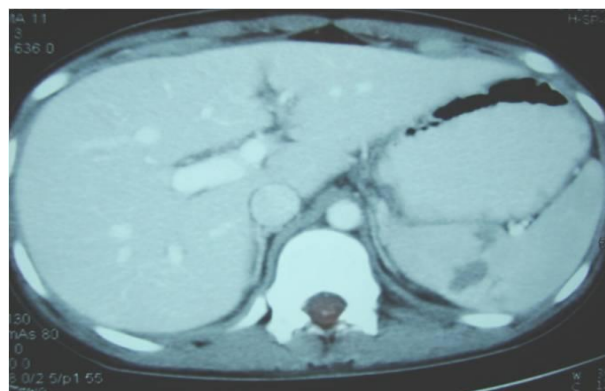


Fig no-3 CECT abdomen showing Gr II laceration & hematoma measuring

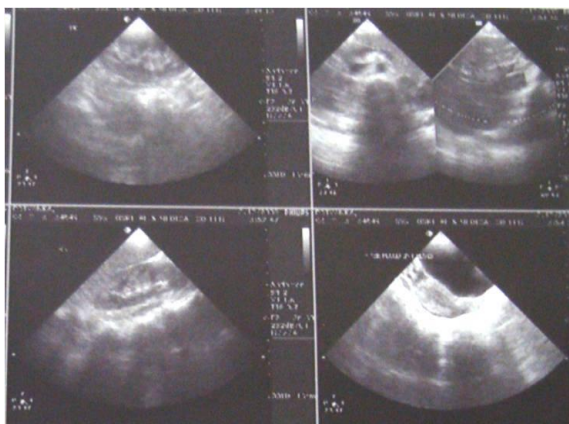


Fig no-4 USG abdomen on seventh day



Fig no-5 USG abdomen after three months

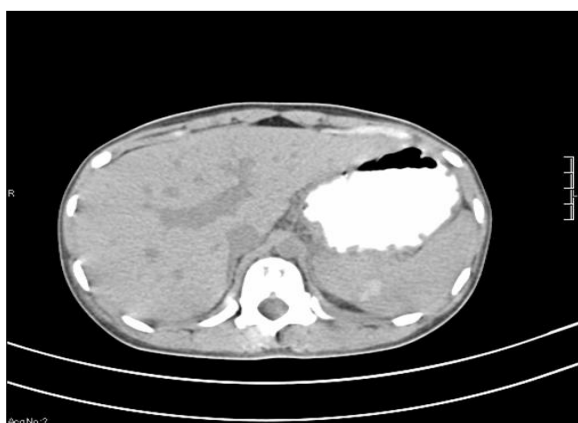


Fig no-6 CECT abdomen after three months

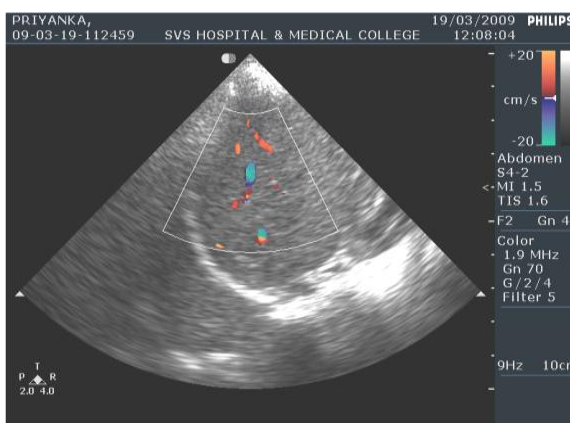


Fig no-7 colour doppler of spleen

## DISCUSSION

Spleen is the most commonly injured organ in blunt trauma to abdomen. Male population is more prone for splenic injury than females. This is probably due to outdoor works and frequent travelling of males due to their jobs. It has been observed that the highest incidence of splenic injury is in the age group of 31-40 years. [13-15] This may be due to increased availability of automobiles at a younger age since majority of blunt abdominal injuries were a result of road traffic accidents. [16-18] The American association for the surgery of trauma has given an organ injury scale for spleen. (Table-1)

### Table-1 Splenic injury scale

The management of blunt trauma to the spleen in children has become routine, with 90% of them being successfully treated non-operatively. [19] Reports of selected adults with blunt trauma to the spleen managed by observation had varying

degrees of success, suggesting that either there were intrinsic differences between the spleens of adults and children or there were other factors that determined the success of non-operative treatment. [20] The risk of infection would increase with the transfusion requirements due to the greater damage to the spleen in adults. [19] The clinical examination still remains as a main tool for inclusion in the NOM protocol for high grade splenic injuries. The criteria for non-operative treatment of splenic injuries in adults are:

- No altered level of consciousness,
- Hemodynamically stable after minimal fluid resuscitation,
- No physical findings or any associated injuries requiring laparotomy,
- Documentation of splenic injury by imaging techniques, and
- No recurrent blood transfusion due to fall of hemoglobin/ hematocrit levels. [21,22]

Grade	Type	Injury description
Grade I	Hematoma Laceration	Sub capsular,<10% surface area Capsular tear,<1cm parenchymal depth
Grade II	Hematoma Laceration	Sub capsular,10-50% surface area, intra parenchymal<5cm in diameter Capsular tear 1-3 cm, parenchymal depth that doesnot involve trabacular vessel
Grade III	Hematoma Laceration	Sub capsular,>50% surface area, or expanding, ruptured sub capsular or parenchymal hematoma, intra parenchymal hematoma >5 cm. or expanding >3cm parenchymal depth. Or involving trabacular vessel
Grade IV	Laceration	Laceration involving segmental or hilar vessels producing major de vascularization(>25% of spleen)
Grade V	Laceration Vascular	Completely shattered spleen Hilar vascular injury devascularising spleen

The management of blunt splenic trauma in adults has slowly evolved over the past three decades from a mandatory laparotomy and splenectomy to a nonoperative approach. The increased diagnostic accuracy of splenic injury by CT scanning and the recognition of early postoperative and late septic complications in the splenectomy patient [23] are the two factors which altered the treatment of splenic trauma in favour of splenic salvage. Patients who respond to resuscitation after a brief episode of non-recurring hypotension can also be treated nonoperatively. [24] Elderly patients have previously been excluded from recommendations for non-operative treatment of splenic injuries, according to various studies. [25] Not only the rapid diagnosis capability offered by CT to identify the pattern and degree of splenic injury but also an estimate of the volume of free intra-abdominal blood has led to a greater acceptance of its use in diagnosing blunt splenic trauma. Angiography with embolization of the splenic artery should be performed in hemodynamically stable patients with serious splenic injuries, since the risk of NOM failure is high.

## CONCLUSION

The most affected age group is third decade with gross preponderance of male

population. Blunt trauma due to Road Traffic Accidents far exceeded other causes. Rib fractures, hemothorax or pneumothorax, and even an abrasion on left loin due to trauma should raise strong suspicion of splenic injury. In a case of poly trauma, absence of signs and symptoms of abdominal trauma like guarding, rigidity, tenderness and distention does not exclude splenic trauma. Grade I and II splenic injuries that do not have other abdominal injuries necessitating laparotomy can be safely managed by Non Operative Management.

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