

CASE REPORT

Conservative management of AAST Grade 4 spleen and AAST Grade 5 livers injury in Blunt trauma abdomen

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Abstract

Over the years, the management of blunt trauma abdomen (BTA) has changed, especially in children. Operative management has evolved into a non-operative management (NOM) approach, with surgery reserved for those who present in extremis or become hemodynamically unstable despite resuscitation. This NOM approach has been associated with improved survival rates in severe liver injury and severe splenic injury. Patients that fail NOM and require emergency surgery are associated with increased morbidity and mortality. Therefore, management of even the severe American Association for the Surgery of Trauma (AAST) grade injuries of liver and spleen are managed based on the hemodynamics and general condition of the patient.

Key words: liver injuries, spleen injury, blunt trauma abdomen, non-operative management

Introduction

Blunt abdominal injuries and blunt chest injuries in children occur because of compression to the abdomen and thorax due to high-energy traumas like traffic accidents, falls from height or fall of heavy objects over the said areas. The spleen is the most commonly injured organ following blunt abdominal trauma whereas liver is the second. The most common cause of spleen and liver injury is trauma to the upper abdomen or left and right hemithorax respectively.^(3,4) Ultrasonography (USG-FAST), computed tomography (CT) and liver function tests (LFTs) are tools used for the diagnosis. Physical examination findings may not be sufficient for diagnosis even in serious injury, hence these are graded on the base of CT findings as American Association for the Surgery of Trauma (AAST) grade 1 to 5, from least severe to most severe. Grade 4 and 5 injuries usually need some type of intervention (Operative management or angio-embolization) but this mainly depends on the hemodynamics of the patient.⁽¹⁾

In hemodynamically stable patients, spleen and liver injuries are managed conservatively, but if there is hemodynamic instability, patients are managed surgically.^(2,6) Surgery is required if patients need blood transfusions of over 40 ml/kg/day or if there are findings indicating peritoneal irritation or hollow organ perforation. Splenectomy, segmental resections of liver, or repairs can be performed in surgery according to the type of injury. Complications like atelectasis, pneumonia, sepsis, intraabdominal abscess, and hemobilia and those due to blood transfusions have

been observed after spleen and liver injuries.⁽⁵⁾ Here is a case of a child where she was successfully managed conservatively despite having grade 4 splenic and grade 5 liver injury along with other concomitant injuries.

Case Summary

A 6-year-old female child presented to emergency with history of fall of brick wall over her while playing. At the time of presentation, she had low BP-90/68 mmHg and was tachycardic-128/min. She was also in respiratory distress. The E-FAST scan turned out positive i.e. there was free fluid in abdomen (in pelvis and Morrison's space) and left CP angle was obscured. X-ray chest revealed multiple rib fractures with hemopneumothorax on left side. She also had left shaft of humerus fracture. Her hemoglobin was 8.3g/dL and hematocrit 32%. ICD was inserted on left side. She responded to fluid resuscitation and blood transfusion and her BP stabilized. CECT was done which revealed grade 4 splenic and grade 5 liver injury. As her vitals improved, she was planned to be managed conservatively. She was to PICU (Pediatric Intensive Care Unit) where her hemodynamics were closely monitored for 10 days following which she was shifted to ward. She was discharged on 15th day of admission with BP-112/74 mm/Hg, HR-96/min and hemoglobin-10.2 g/dL.

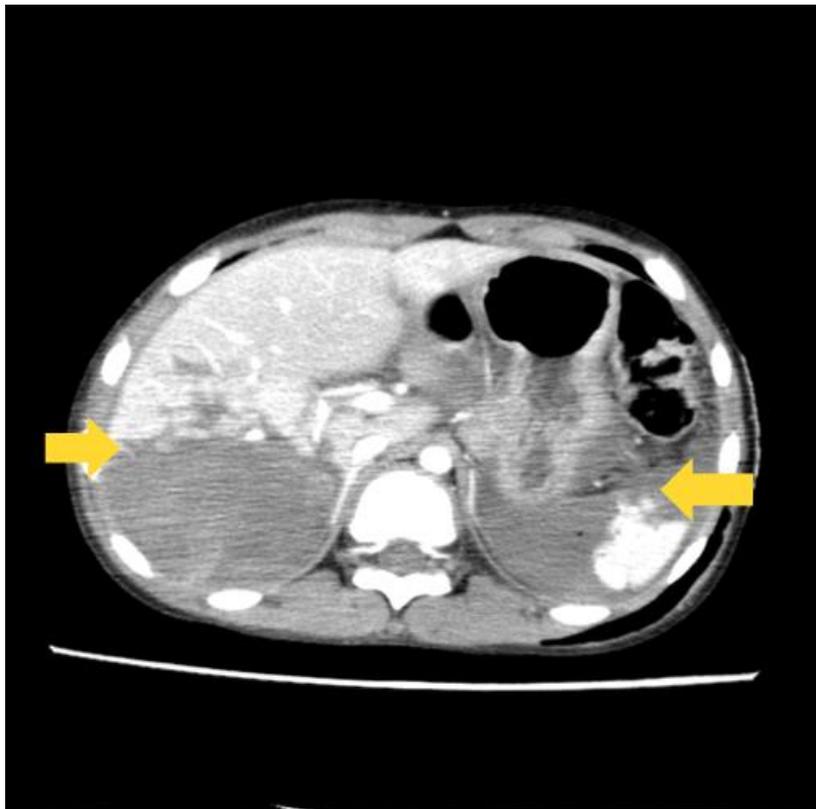


Figure 1: CECT image of the patient showing extensive hepato-splenic injury

Discussion

The medical literature is replete with data confirming the safety of selective nonoperative management of blunt solid organ injuries. Nonoperative management of grade 4 and 5 liver and spleen injuries remains an effective treatment strategy with low mortality.⁽⁵⁾ It is now well documented that patients managed non-operatively require less transfusions than those undergoing surgical management. It is observed that CT grade does not accurately predict the severity of injury, and physiology, so, it should

not dictate the treatment. Parameters such as transfusion, hemodynamics and required days of bedrest or hospitalization should govern the management of patients. Even patients with more complex injuries such as head injury or other operative injuries, whose response to spleen or liver injury is difficult to determine, can be safely managed without surgery.⁽⁷⁾Hence, conservative management is successful in most of the liver and spleen injuries and it is expected to be implemented in most cases with advent of angio-embolization.⁽⁸⁾ After discharge, absolute bed rest for 7-10 days and limited physical activity for 4-6 weeks are recommended.

Conclusion

In conclusion, this case report highlights the successful implementation of conservative management in a patient with severe blunt trauma abdomen and blunt trauma chest resulting in grade 5 liver injury and grade 4 spleen injury as well as multiple rib fractures on the left side. Through meticulous monitoring, timely intervention, and comprehensive multidisciplinary care, the patient demonstrated favorable outcomes without the need for surgical intervention. This approach underscores the importance of individualized treatment strategies tailored to the specific needs and circumstances of each patient. While surgical intervention remains a cornerstone in the management of severely injured patients, conservative management can be a viable option in select cases who are responding well, offering promising results and potentially avoiding the inherent risks associated with surgery. Further studies and ongoing evaluation are warranted to elucidate the optimal management strategies for patients with similar injuries, ultimately contributing to improved patient outcomes and enhanced clinical decision-making in the field of trauma care.

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