Case Report

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Double Jeopardy: A Case of Non Operative Management of Simultaneous High-grade Splenic Injury with High-grade Renal Injury

Surgery Section

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ABSTRACT

High-velocity blunt trauma to the abdomen can result in multiple solid organ injuries, leading to catastrophic bleeding and mortality. Non Operative Management (NOM) of isolated solid organ injury is well established. NOM ranges from observation and monitoring to angioembolisation, with the aim of preserving the organ and its function. NOM for splenic trauma is considered the first line of management in haemodynamically stable patients. NOM for high-grade renal injury is controversial. NOM for simultaneous multi-organ injuries is challenging and the possible advantages of this treatment pathway are still debated. In the present case report (54-year-old female patient), the patient presented with blunt abdominal trauma and imaging revealed a Grade IV splenic injury along with a Grade V renal injury. As the patient remained haemodynamically stable and imaging did not show any active bleeding, NOM was adopted with intensive monitoring and multiple blood transfusions.

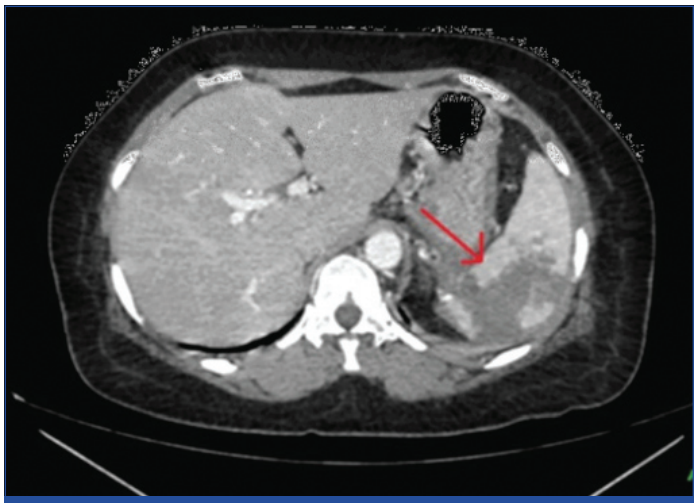
Keywords: Blunt trauma abdomen, Multiple organ injury, Non operative treatment

CASE REPORT

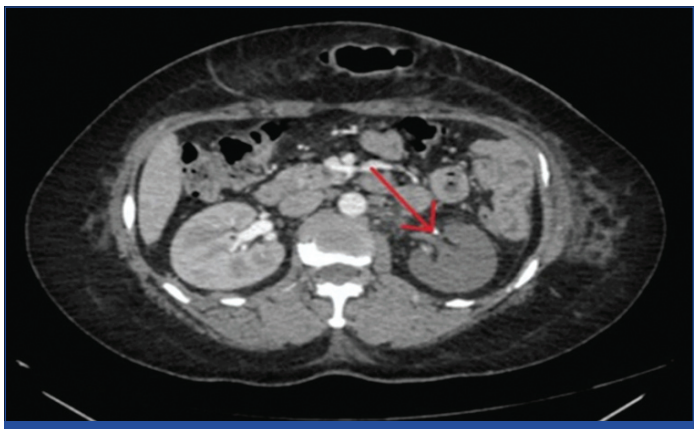
A 54-year-old female patient presented to the Emergency Department four hours after sustaining abdominal trauma from the collision of her two-wheeler with a car. She was initially managed in a nearby small private hospital and later referred to the present hospital. She sustained an injury to the left upper quadrant of the abdomen and the right thigh and complained of left upper abdominal pain and vomiting. She appeared pale, with a pulse rate of 128 bpm, blood pressure of 110/70 mmHg and a Glasgow Coma Scale (GCS) of 15/15. The abdomen showed contusions over the left hypochondrium, umbilical region and suprapubic region. An epigastric hernia, possibly due to the traumatic abdominal wall tear, was evident [Table/Fig-1].

[Table/Fig-1]: Abdomen contusions and traumatic epigastric hernia.

Blood investigations showed a haemoglobin level of 5.5 gm%, urea of 179 mg/dL and creatinine of 6.08 mg/dL. She was transfused with four units of blood and underwent dialysis twice. A Computed Tomography (CT) scan of the abdomen showed a splenic laceration [Table/Fig-2], classified as an injury of Grade IV according to the American Association for the Surgery of Trauma [1]. The scan also revealed a completely devascularised left kidney, with no excretion of contrast in the collecting system and complete opacification of the left renal artery and vein, suggesting an American Association for the Surgery of Trauma (AAST) Grade V renal injury [Table/Fig-3].



[Table/Fig-2]: Contrast-enhanced Computed Tomography (CECT) showing splenic injury.



[Table/Fig-3]: CECT showing renal injury.

The patient remained haemodynamically stable, with haemoglobin above 8 gm/dL throughout her hospital stay. Her renal functions improved to normal levels after multiple dialysis sessions. A renal Diethylenetriamine Pentaacetic Acid (DTPA) scan was unavailable

in the hospital; however, as she remained haemodynamically stable with no further ongoing bleeding, renal injury was managed conservatively without nephrectomy. The CT scan of the abdomen showed a tear in the abdominal wall muscles (with the skin and deeper layers intact) and since the patient underwent NOM for major organ injuries, she was reluctant to undergo repair of the abdominal wall tear. Consequently, the patient was discharged with advice that she could develop a hernia in the future, which would require repair.

The patient was readmitted a week after discharge with an obstructed abdominal wall hernia. Her vitals were stable at presentation and authors proceeded with emergency surgery for the obstructed hernia. The hernia was accessed through the contused part of the abdominal wall and the contents were reduced. The tear in the oblique and transversus abdominis muscles was repaired and an onlay mesh was fixed. The patient had an uneventful recovery and was discharged. At the four-week follow-up, a CECT scan of her abdomen showed a resolving hematoma around the spleen and no abnormalities in the injured left kidney.

DISCUSSION

The most commonly injured major solid organs following Blunt Abdominal Trauma (BTA), in order of incidence, are the spleen, liver and kidney. Splenic injury is the leading cause of massive bleeding among all solid organ injuries [2]. Current guidelines for BTA advocate for NOM for a significant proportion of patients with isolated solid organ injury who present with stable hemodynamics [1,3]. NOM is feasible for single organ injury and is considered the treatment of choice in haemodynamically stable patients [1]. NOM involves monitoring in an intensive care setup with readily available operating room backup. Interventional angioembolisation has recently been included as part of NOM for salvaging the injured solid organ. Established standardised criteria exist for selecting patients who can undergo NOM [1,3,4].

The standard selection criteria for successful NOM for isolated solid organ injury are outlined by the World Society of Emergency Surgeons and the Eastern Association for Surgery of Trauma (EAST) [3,4]. NOM is considered the gold standard for all grades of blunt splenic injuries in haemodynamically stable patients [4-6]. The EAST guidelines also indicate that higher grades of splenic injuries and the amount of hemoperitoneum do not affect NOM outcomes [3].

There is still controversy regarding the adoption of NOM for Grade V renal injuries, which are traditionally managed with surgical intervention [1,7]. Altman AL et al., in their retrospective study, documented the validity of NOM for Grade V renal injuries in haemodynamically stable patients. They demonstrated that patients managed with NOM required fewer blood transfusions, had shorter intensive care stays and experienced fewer complications [8].

Currently, there are no clear guidelines for NOM in cases of simultaneous multiple solid organ injuries, especially for higher injury severity grades.

In the selected subset of patients with favourable haemodynamics and other parameters, NOM can be utilised to avoid complications and morbidity related to surgical intervention. For instance, Demuro J has reported a case involving high-grade liver and renal injuries that was managed successfully with NOM [9]. Similarly, Laculiceanu A et al., reported a case of splenic and high-grade renal trauma managed conservatively [2]. The advantages of NOM over operative management include the avoidance of laparotomy, low morbidity and mortality rates, minimal blood transfusions, reduced intra-abdominal complications, maintenance of immunological functions and a shorter hospital stay [6]. Nguyen PTT and Hsu JM have stated that NOM, along with angioembolisation techniques, can be a viable and effective option for patients with high-grade splenic and de-vascularised renal injuries [10]. In the present patient, NOM was successful without the need for interventional radiology, as the CT scan did not show any contrast blush, indicating no active bleeding.

Patients with multiple solid organ injuries, especially those with higher grades, can deteriorate at any time and become haemodynamically unstable. Monitoring should occur in an intensive care setup with excellent blood bank support and around-the-clock availability of an operating room and surgical expertise. When these facilities are implemented in a trauma centre, NOM can be considered the first line of management even for high-grade splenic and renal injuries, achieving an almost 95% success rate [8].

CONCLUSION(S)

Practicing NOM in patients with multiple solid organ injuries, especially those with higher grades, requires sound clinical judgement. Multiorgan injuries may not be a contraindication for NOM in a carefully selected subset of patients. Furthermore, these patients should ideally be treated by a multidisciplinary team in a well-equipped trauma centre.

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