

Case Report

Trauma laparotomy for the usual reasons, but for unusual causes

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ABSTRACT

The impact of synchronous diseases or conditions on operative management of Trauma patients is not well established. In trauma patients, secondary diagnoses may complicate the treatment strategy and lead to changes in management and potentially outcomes. We present 5 unusual trauma cases and we discuss the difficulties and the outcomes we experienced in managing these patients.

Case A

An 18-year-old woman suffering a car accident. She was hemodynamically unstable when admitted. Her trauma scores on arrival were New Injury Severity Score (NISS) 41, Shock index (SI) 2.33, Trauma and Injury Severity Score (TRISS) 38.5. She received bilateral chest tubes for hemothorax. The Focus Assessment with Sonography in Trauma (FAST) examination was positive for hemoperitoneum. Despite the resuscitation attempt the patient remained hemodynamically unstable so she underwent a trauma laparotomy. At laparotomy a liver rupture grade IV due to avulsion of a tumor from left liver lobe and significant liver hemorrhage was surprisingly found (Fig. 1). An atypical left liver resection was inevitable (segments II, III, IVa) and hepatorrhaphy of the cut surface completed the procedure. A grade II splenic laceration was also found which was managed by splenorrhaphy. A left femur fracture was externally fixated. Patient died of her wounds at the Intensive Care Unit in the first 24 h postoperatively. Postmortem examination revealed that she had additionally suffered from lung contusions, azygos vein laceration, myocardial contusion and a minor zone II retroperitoneal hematoma (right perirenal). Histopathology report of the liver tumor indicated a 5.5 cm × 5 cm × 5 cm focal nodular hyperplasia (FNH).

Case B

A 45-year-old man involved in a car accident. His trauma scores on arrival were Glasgow Coma Scale (GCS) 7, NISS 16, SI 2.1 and TRISS 16.5. The patient was hemodynamically unstable and the FAST revealed a large quantity of fluid in the abdomen, therefore he underwent immediately a trauma laparotomy. Intraoperatively an enlarged polycystic liver (GIGOT classification Grade III/Quian's classification grade IV) [1] was found while blood was pouring out between the numerous sizable cysts which covered the liver (Fig. 2). It was not possible to determine the grade of liver injury. All attempts for bleeding control failed, even liver packing was futile because of the numerous cysts. Patient died intraoperatively due to uncontrollable hemorrhagic shock. Postmortem examination revealed that he suffered from polycystic liver and kidney disease.

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Fig. 1. Bleeding due to avulsion of a FNH from the left liver lobe in an 18 years old female who sustained a car accident.

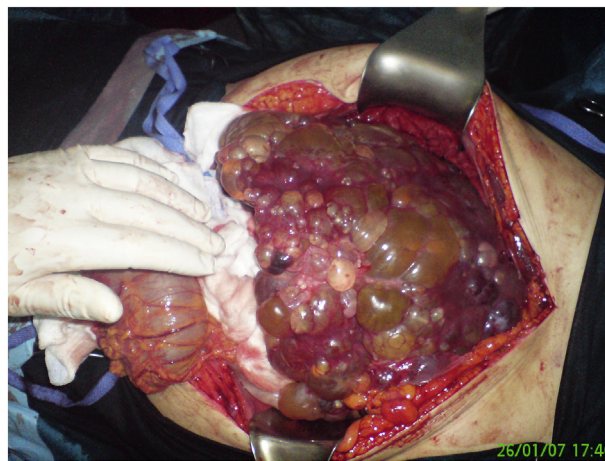


Fig. 2. Trauma laparotomy revealed significant bleeding from the inferior and right surface of polycystic liver (laparotomy pads for an attempted hemorrhage control).

Case C

A 36-year-old woman suffering an abdominal stab wound through the lower anterior abdominal wall. Her trauma scores on arrival were NISS 4, TRISS 83, SI 0.69. Wound exploration showed possible penetration of parietal peritoneum. During clinical examination she was hemodynamically normal but the abdomen showed a slight tenderness. The decision-making about the patient's management was complicated because of her past medical history which included total proctocolectomy and J-pouch ileoanal anastomosis due to ulcerative colitis. Nevertheless, the decision for an exploratory laparotomy was preferred over serial examinations of the abdomen or diagnostic peritoneal lavage (DPL). Trauma laparotomy was negative and postoperative course was uneventful.

Case D

A 66-year-old man suffering a car accident. Upon arrival his trauma scores were NISS 18, TRISS 91, and SI 1.24. His chest X-rays revealed multiple rib fractures at the left hemithorax. Due to deteriorating abdominal tenderness and macroscopic hematuria, a CT scan was performed during a secondary survey. It revealed intraperitoneal fluid in all 4 abdominal quadrants without liver or splenic injury, and a decision for exploratory laparotomy was made. The patient had a medical history of orthotopic ileal neobladder construction following radical cystectomy for bladder cancer 8 years ago. Intraoperatively, rupture of the ileal neobladder was detected, while ureteral implantations sites were intact. Suture repair was performed after debridement. Postoperative course was uneventful.

Case E

A 22-year-old male suffering a blunt abdominal trauma in a car accident. His trauma scores on arrival were NISS 16, TRISS 49.8 and SI 1.51. Patient remained hemodynamically unstable despite resuscitation efforts, while FAST revealed fluid inside the peritoneal cavity. During trauma laparotomy, a grade IV splenic injury was identified and splenectomy was performed. The postoperative period was uneventful. Interestingly, histopathology examination revealed a splenic cavernous haemangioma in the area of splenic rupture.

Discussion

Our Institution is a level II regional Trauma centre with no tertiary services, serving a prefecture with a population of more than 85,000 people which increases to over 130,000 during the summer period.

The Focal Nodular Hyperplasia is a benign and highly vascularized pseudotumor. Spontaneous hemorrhage from a FNH has rarely been reported in literature, while this is the first report in the literature of traumatic avulsion of a liver tumor. Surgical resection of FNH as well as other benign liver tumors is associated with a very low mortality rate if performed in an elective setting [2].

The Autosomal Dominant Polycystic Kidney Disease (ADPKD) is a genetic disorder that affects up to 0.2% of the general population. 75–90% of patients with ADPKD have associated Polycystic Liver Diseases (PLD). Isolated PLD is seen in less than 0.01% of the population. Surgical treatment of PLD remains even in elective settings challenging and ranges between fenestration, liver resection and liver transplantation [1]. To the best of our knowledge no literature is present regarding the management of liver trauma in patients with PLD.

In both Cases A and B massive liver hemorrhage was the leading operative problem. All principles of damage control were insufficient due to underlying medical conditions. Liver resection in Trauma setting is the last choice and every effort should be made to avoid it. Nouri et al. stated recently in their study that bleeding is the main cause of mortality in patients with liver injury, mentioning that a laceration of 3 cm depth in the liver parenchyma is associated with 19% of mortality rate and 25–50% damage in one liver lobe is followed by 28% mortality. In their study they concluded that more research in the direction of the new hemostatic agents (like Ferric chloride, potassium aluminum sulfate or alum and aluminum chloride etc.) is needed [3].

The management of stab wounds to the anterior abdominal wall penetrating the peritoneum remains challenging. A laparotomy is indicated if patients are in shock or if evisceration or signs of peritonitis are present. In any other case, serial examinations and re-evaluation is implied [4]. Our trauma patient in case C had no clear indication for laparotomy, and therefore a non-operative approach would be justified according to current management algorithms. Nevertheless, due to her past medical history and the slight tenderness of her abdomen, it was in the patient's interest to intervene as soon as possible, in order not to risk the preservation of her small bowel. Adhesions from the previous operation might increase the probability of small bowel injury, if tethering it to the abdominal wall. Moreover, adhesions could confine a leak from bowel injury and so the patient might not develop diffuse peritonitis or might have mild findings in physical examination. On the other hand, adhesions render the bowel prone to injury intraoperatively. In any case, the quality of life of the patient might worsen if small bowel resection is inevitable.

The reconstruction of the urinary tract through the creation of an ileal neobladder is a widely-performed procedure [5]. In our trauma case D it was critical to explore and to be certain about the integrity of the ureteral implantation sites and to preserve this kind of reconstruction while fixing the rupture. There is no similar report in the literature of such types of traumatic injury.

The cavernous haemangioma of the spleen is a rare finding with fewer than 100 cases being reported although it is at the same time the most common benign splenic tumor. A spontaneous rupture in these patients is as high as 25% [6]. This fact makes highly possible the suspicion that these tumors might predispose patients to a splenic rupture during a trauma incidence. Moreover, the presence of such a tumor in the injured spleen might adversely affect a non-operative approach imposing splenectomy.

Conclusion

Trauma patients always constitute a diagnostic and therapeutic challenge. The need for immediate evaluation and decision-making is of paramount importance. Management algorithms are needed for fast categorization and decision-making, but we cannot oversee the fact that every trauma patient is an individual with unique characteristics that can force an altered therapeutic strategy. Existing guidelines and our training regarding the management of trauma originates mainly from the battlefields where victims are mostly young and healthy patients. On the contrary, in civilian trauma it is more probable to confront patients with synchronous diseases, demanding surgeon's awareness and appropriate training.

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