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Blunt Abdominal Trauma with Gallbladder Rupture in a Patient with Cirrhosis

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1. Introduction

A 61-year-old male was involved in a motor vehicle collision as a rear seat passenger. There was one fatality in the vehicle. The patient was unresponsive at the scene and had prolonged extrication. On admission to the trauma bay his vital signs were: BP – 73/37, Pulse-108, R-22, Pulse Ox 99%. The patient exhibited incomprehensible speech but no initial movement of his extremities. There was right mid-clavicle crepitus and bruising. The abdomen was soft and non-distended. The pelvis was stable. The initial FAST was positive in the right upper quadrant. A repeat systolic blood pressure was 68 with a pulse of 117.2 units of packed cells were initiated. A CXR revealed multiple right sided rib fractures and a right pneumothorax [Figure 1]. A right chest tube was inserted and the patient was taken to the operating room for abdominal exploration. Repeat vital signs within 5 minutes of admission and just prior to OR transport revealed a Blood pressure of 94/46 with a pulse of 104 and respirations of 24. Oxygen saturation was 100%. The initial serum lactate was 4.6. The initial base deficit was 7 and the hemoglobin was 10.9 WBC – 10,900 Platelet-62,000. Serum glucose was 253 mg/dl. The initial albumin was 2.7 g/dl with a bilirubin of 2.2. SGOT – 156 and SGPT-57 A TEG was done – ACT was 105 R time – 0.6 with a MaxAmp - 43.2 INR -1.27 .

Exploratory laparotomy was performed. A ruptured gallbladder along with a grade 3 liver laceration was evident involving the right lobe. The laceration extended into the gallbladder fossa. Gross evidence of cirrhosis with a markedly nodular liver was present. A damage control approach was taken. The gallbladder mucosa was bleeding. It was cauterized and then the gallbladder packed with gelfoam and suture closed. The liver laceration was packed with 5 laparotomy pads. The rest of the abdomen was explored and no bowel or other solid organ injuries were noted. A negative pressure dressing was placed to achieve closure of the abdomen. The patient received 8 units of packed cells, 7 fresh frozen plasma, one platelet pack and one unit of cryoprecipitate during the operative intervention. The EBL was 1500 ccs. The post-operative CXR revealed the right chest tube in good position with an endotracheal tube in place [Figure 2].

The patient was transported intubated to the ICU. A survey CT scan of the abdomen was performed [Fig. 3, Fig.4]. Right upper quadrant packs were in place. A survey CT of the spine revealed a T9 superior end-plate fracture and a T10 central body fracture. The patient was able to follow commands with normal strength in all extremities. 48 hours later with hemodynamics stable and coagulopathy reversed, he was taken back to the operating room. The packs were removed and the abdominal cavity irrigated. The gallbladder was opened and the residual gelfoam removed. A cholecystostomy tube was placed along with several Jackson Pratt drains in the right upper quadrant. The midline incision was closed. Acute lung injury ensued. This responded to ventilatory support with a pressure control setting. He developed a nosocomial pneumonia and tracheobronchitis with Klebsiella and Acinetobacter that responded to intravenous Ciprofloxacin. A tracheostomy was performed after he was weaned from pressure control. Large volume ascitic fluid drained from the right upper quadrant drains. This responded to intravenous albumin and lasix. The patient was started on daily spironolactone for control of the ascites. The JP drains were removed and a cholecystogram was performed. This study was normal. The tube was subsequently removed. He was transferred to the floor. The tracheostomy tube was downsized and eventually removed. He began to tolerate a diet with normal bowel activity. He was discharged to home ambulating and in good condition after a 54-day hospital stay.

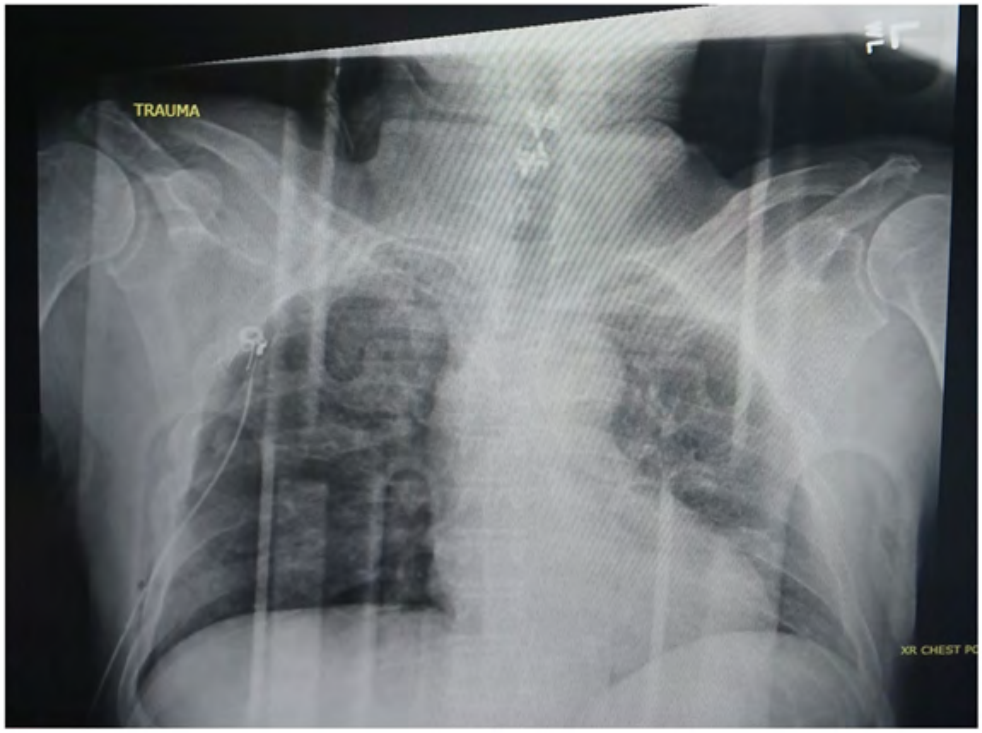

Figure 1

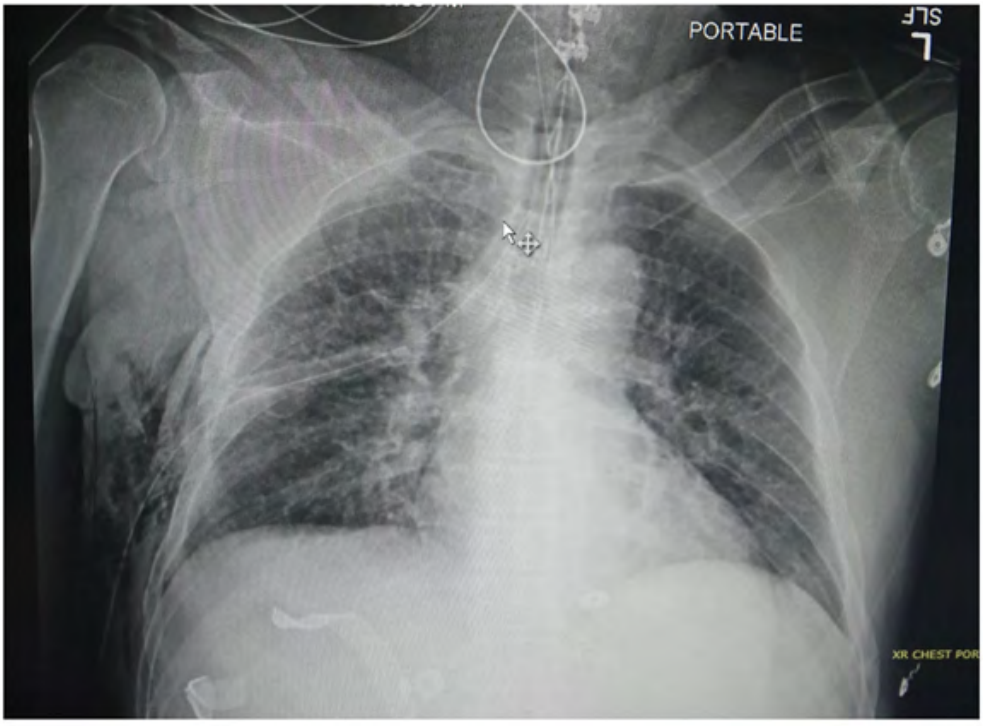

Figure 2

Figure 3

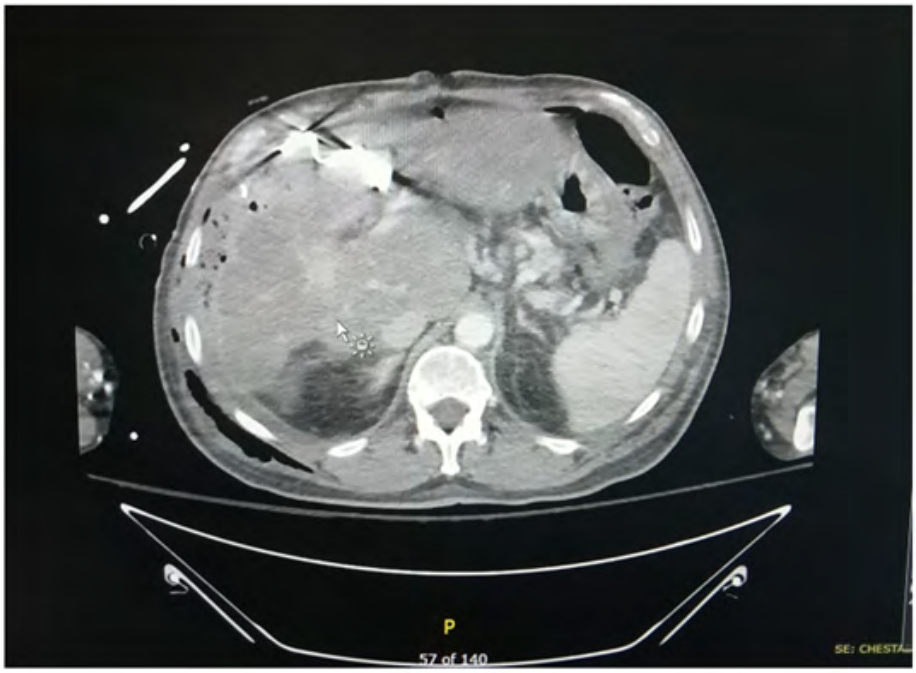

Figure 4

2. Discussion

This patient was involved in a high-speed motor vehicle collision as a rear seat passenger. Significant energy transfer was evident with a fatality at the scene. The initial chest-x-ray [Fig.1] revealing multiple rib fractures and a right sided pneumothorax underscores the severity of the blunt trauma sustained. Although this patient's abdomen was soft and non-distended the initial FAST was positive in the right upper quadrant. ATLS principles were followed and a right chest tube inserted with resolution of the pneumothorax and improvement in the vital signs. 2 units of packed cells were started prior to transport. The initial labs were consistent with hemorrhagic shock. The elevated bilirubin and liver enzymes along with the low albumin likely reflected the presence of cirrhosis. Given the operative evidence of cirrhosis a damage control approach for the liver injury was selected. The massive transfusion protocol was implemented. Clinical outcomes based on the PROPPR trial are improved when a 1:1:1 ratio is administered [1]. Damage control laparotomy combined with damage control resuscitation has consistently demonstrated improved outcomes [2,3]. Cauterizing the gall bladder wall and packing the gallbladder with gelfoam in this setting is a novel approach. We reasoned that formal cholecystectomy in this patient was not a good option given the location of the liver laceration and the presence of cirrhosis. Although there have been case reports of successful cholecystectomy in the setting of cirrhosis and gallbladder injury from trauma, concern has been raised regarding increased mortality [4]. One large population-based data base from England documented a fourfold increase in mortality for those patients with cirrhosis requiring an emergency cholecystectomy [5]. Stratifying patients based on the severity of cirrhosis has been advocated as a way to gauge overall risk of operative intervention [6,7].

Initial packing followed by cholecystostomy tube placement was an effective option in this setting. The post-operative course of nosocomial pneumonia and the need for lung protective ventilation was not unexpected. The development of ascites was also anticipated. This responded to intravenous lasix, albumin and spironolactone therapy [8]. Spironolactone is especially effective in this setting given its aldosterone inhibition [9,10]. In summary we report a case of blunt gallbladder rupture and liver injury in a patient with pre-existing cirrhosis treated with initial gallbladder packing using gelfoam along with liver packing. The subsequent laparotomy involved removal of packs and placement of a cholecystostomy tube. This tube was removed prior to discharge of this patient to home.

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