Operative management of hepatic compartment syndrome after blunt liver injury - a case study

John Fletcher, MD[1], Sarah Thomas, MD[2], Luis Alicea, ARRT (CT)[2], Christina Riojas, MD[2], Emily Hathaway, MD[2], Timothy Nuñez, MD[2]

1 Oregon Health & Sciences University, Portland, OR; 2 Brooke Army Medical Center, San Antonio, TX

BACKGROUND:

Blunt liver injury is increasingly managed non-operatively in modern trauma centers. Hepatic compartment syndrome is a rare and poorly described clinical entity seen most commonly following percutaneous liver biopsy. Herein we report the first case of post-traumatic hepatic compartment syndrome and its operative management.

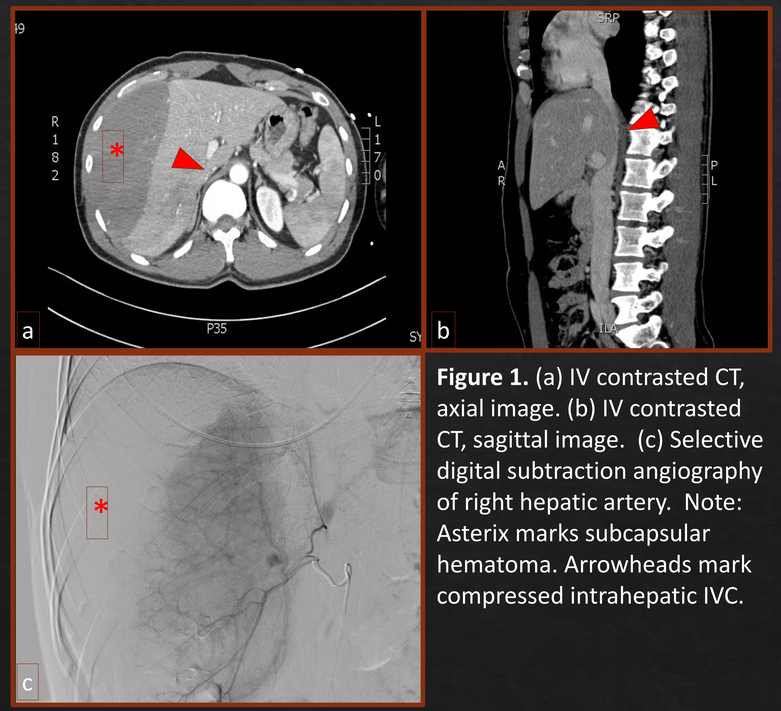


Figure 1. (a) IV contrasted CT, axial image. (b) IV contrasted CT, sagittal image. (c) Selective digital subtraction angiography of right hepatic artery. Note: Asterix marks subcapsular hematoma. Arrowheads mark compressed intrahepatic IVC.

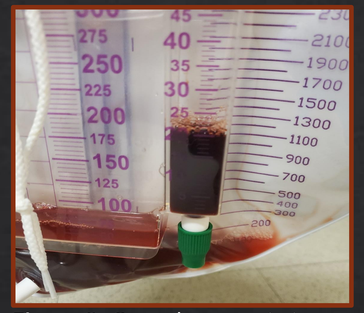


Figure 2. Gross hematuria in the absence of known renal injury or rhabdomyolysis.

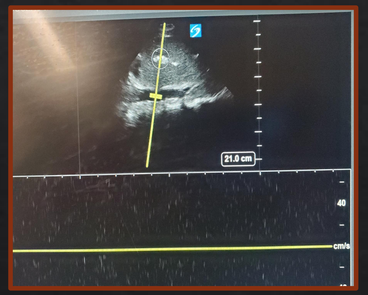


Figure 3. Point of care ultrasound, Pulse wave doppler showing no phasic flow in the occluded IVC. Arrowhead marks bird beak appearance of IVC.

CASE:

A 29 year-old man sustained an isolated Grade IV blunt liver injury without capsular rupture after a fall from height (Fig 1). On admission transcatheter embolization of active intrahepatic hemorrhage was performed. Within 24 hours of admission gross hematuria and acute oliguric renal failure developed (Fig 2). Bedside ultrasound identified complete occlusion of the retrohepatic inferior vena cava (IVC) and cessation of renal venous outflow (Fig 3). No direct renal injuries were identified. These findings are consistent with hepatic compartment syndrome. The patient was taken emergently to the operating room for decompression of the liver with the intent of restoring venous outflow from the infrahepatic IVC. Following decompression and evacuation of approximately 1 liter of clot and blood from the hepatic capsule antegrade flow in the IVC was restored (Fig 4). Despite restoration of antegrade caval blood flow oliguric renal failure persisted and renal replacement therapy was required for 32 days. His course was also by complicated acute liver failure which was successfully medically managed. He was ultimately discharged on hospital day 53 having achieved complete renal and hepatic recovery.



Figure 4. IV contrasted CT, sagittal image demonstrating restored caliber of the intrahepatic IVC (arrow)

CONCLUSION:

Hepatic compartment syndrome is a rare but severe complication of blunt liver injury. Optimal management strategies for post-traumatic hepatic compartment syndrome are unknown. Surgical decompression may have a role in the management of post-traumatic hepatic compartment syndrome but its timing and overall utility remain unclear.

The views herein are those of the authors and do not represent the United States Army, United States Air Force, Defense Health Agency, Department of Defense or the United States Government.