

SAFE! Successful Nonoperative Management of a Sport-Induced Grade V Hepatic Injury

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Introduction/Background

Liver injury is one of the most common sequelae of blunt abdominal trauma. While vehicular trauma is the leading cause of blunt liver injury, they may also result from falls or direct blows to the abdominal wall [1-3]. In the last three decades, there has been a paradigm shift as the blunt liver injuries has evolved to primarily nonoperative management. Even in Grade V injuries, the most severe liver injury score grade deemed by the American Association for the Surgery of Trauma, the success rate of non-operative management has been 50% to 83%, with the key differentiator of success attributed to hemodynamic stability.

This case presents an unusual presentation of blunt liver trauma during a baseball game resulting in a Grade V liver injury that was able to avoid operative management and angioembolization through utilization of conservative management.

Case Presentation/Methods

A 17-year old male presented to a Level 1 trauma center after colliding with another teammate during a baseball game. The patient was looking to catch a baseball when another outfielder collided with him, hitting his chest, elbowing his abdomen, and causing him to fall to the ground. Afterwards, the patient had an episode of hematemesis. Upon arrival to the ED, the patient vitals were within normal limits and remained hemodynamically stable. He complained of chest pain, right rib cage pain and right upper quadrant abdominal pain. Lab work revealed a leukocytosis (WBC 19) and transaminitis (AST 368, ALT 396). Initial computerized tomography (CT) scan showed right middle lobe and left lower lobe pulmonary contusions with small pneumatoceles and a liver laceration with extension to the hepatic veins and inferior vena cava (IVC) with surrounding hemorrhage of the left hepatic vein consistent with a grade V injury and large amount of hemoperitoneum (See Figure 1.A and 1.B). Portal vein was patent.

Patient was admitted to the surgical intensive care unit (ICU) and vascular surgery was consulted. Echocardiogram was performed to assess IVC for thrombus, which was negative. Patient was monitored with serial abdominal exams and trending hemoglobin (See Figure 2). Patient's vitals remained stable and required no blood transfusions. By hospital day 3, his leukocytosis had resolved. By hospital day six, his transaminitis was near normal (AST 43, ALT 170) and he was discharged home.

Follow-up after the initial injury show a partially occluded left hepatic vein with decreased hematoma after a week and decreasing liver laceration with thrombosed left hepatic vein and patent inferior vena cava at 39 days (see Figure 1.C and 1.D).

Figures

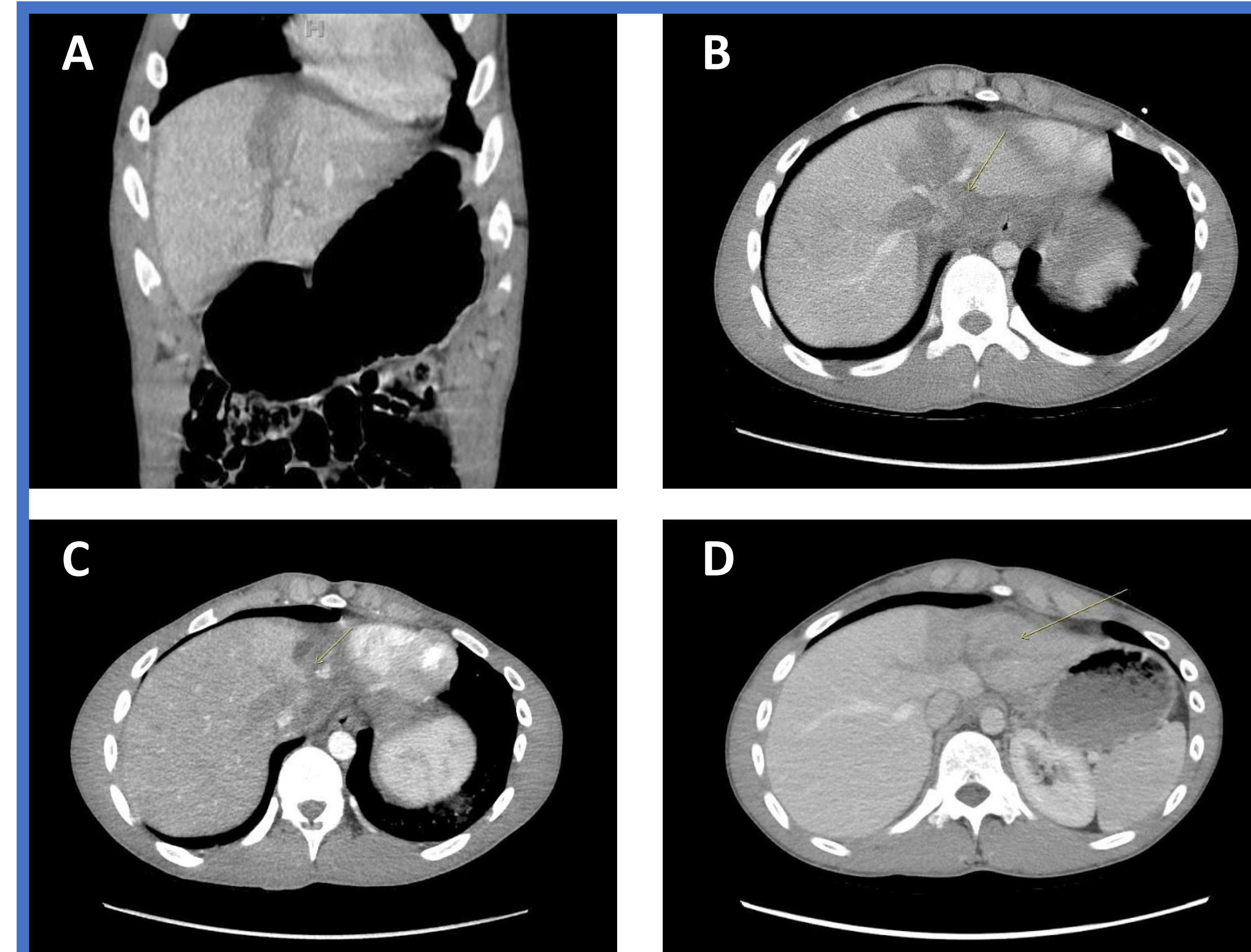


Figure 1: Initial and Follow-up Imaging.

A (top left): Initial CT Abdomen and Pelvis sagittal view demonstrating extent of liver laceration.

B (top right): Initial CT Abdomen and Pelvis showing a small amount of hemorrhage with partially occluded left hepatic vein.

C (bottom left): CT Angiogram of Abdomen performed seven days after injury, showing partially occluded left hepatic vein.

D (bottom right): CT Abdomen and Pelvis with IV contrast performed 39 days after injury showing fully occluded left hepatic vein.

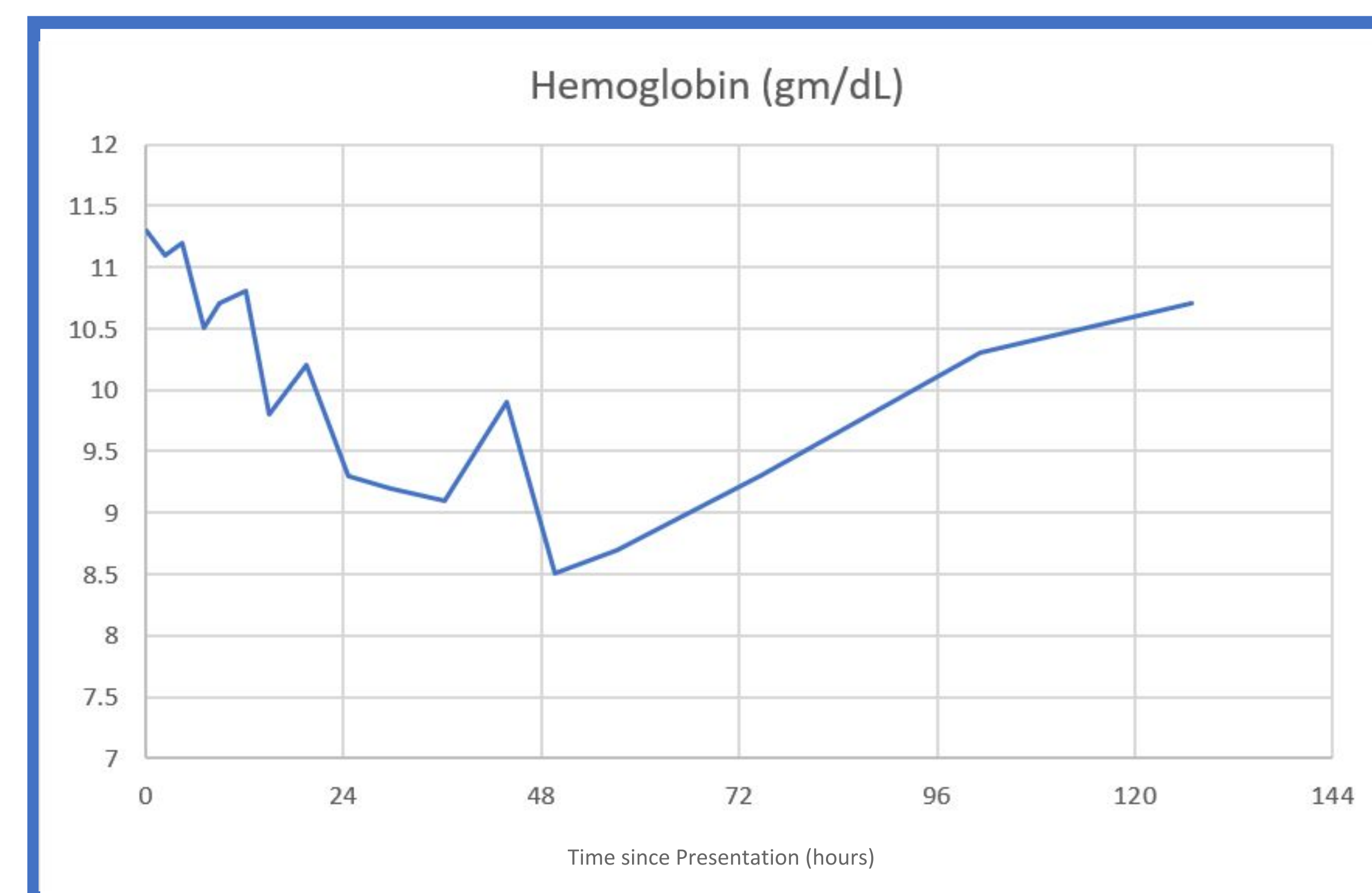


Figure 2: Hemoglobin Trend. Patient's hemoglobin trend during his admission was never noted to be below 8, and thus required no blood transfusions.

Discussion

The liver is one of the most injured abdominal organs in blunt trauma [1,2]. This case presents an unusual presentation of a sport-related blunt trauma resulting in an AAST Grade V liver injury. In addition, this case highlights that operative management, angioembolization and even transfusion is not required in all Grade V liver injuries if the patient remains hemodynamically stable. Indications for operation include hemodynamic instability, associated hollow viscus injury in penetrating injury, failure of angioembolization and increased transfusion requirement for blunt trauma [4]. For Grade V hepatic injuries requiring operation, the mortality rate ranges from 68% to 80%.

Nonoperative management of hepatic injuries does have its own risks. Potential complications include bile leaks, hemobilia, bile peritonitis and delayed hemorrhage, with increasing complication rates as high as 64%. In a Level 1 trauma center retrospective review, 52.6% of Grade IV and V injuries required blood transfusion, with most patients requiring blood transfusions needing over 10 units of packed red blood cells [2]. Because of the high rate of these potential complications, nonoperative management of severe hepatic injuries still incorporates ICU observation with serial abdominal examinations and serial hemoglobin monitoring [5]. Furthermore, repeat CT imaging is commonly obtained several weeks later to monitor for potential delayed complications [6].

Because of the morbidity and mortality that may arise with interventional management of hepatic injuries, often the best management remains close observation in a hemodynamically stable patient requiring no transfusions, even despite potential complications of nonoperative management.

Conclusions/Discussions

We present a case of a 17-year old male who sustained a Grade V left hepatic vein injury during a baseball game who was able to avoid operative management and angioembolization. This case highlights that high-grade injuries can result from sports and that despite hemoperitoneum and high AAST grade, hemodynamic stability and lack of transfusion requirement can be managed without any intervention and portend to favorable prognosis.

References

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