Journal of Pediatric Surgery (2013) **48**, E9–E12

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Journal of Pediatric Surgery

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# Traumatic hepatic artery laceration managed by transarterial embolization in a pediatric patient☆

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Received 31 December 2012; revised 18 February 2013; accepted 18 February 2013

**Key words:**
Pediatric trauma;
Liver laceration;
Blunt Trauma;
Angioembolization

**Abstract** While blunt abdominal trauma with associated liver injury is a common finding in pediatric trauma patients, hepatic artery transection with subsequent treatment by transarterial embolization has rarely been reported. We present a case of a child who suffered from a hepatic artery injury which was successfully managed by supraselective transarterial microcoil embolization, discuss management strategies in these patients, and provide a review of currently available literature.


Blunt abdominal trauma is a significant cause of morbidity and mortality in the pediatric patient. Liver and spleen injuries account for over 70% of all intraabdominal injuries in children [1]. The majority of liver injuries in pediatric patients are able to be managed without surgery, although hemodynamic instability has been found to be a predictor of failing non-operative management [2]. A potential adjunct to non-operative management is the use of transarterial embolization (TE) to control arterial bleeds. While this has been described in the adult population, there have been only a handful of cases describing TE as the primary control for traumatic hepatic artery bleeds in the pediatric population [3–9]. We present another case of successful management of a traumatic hepatic artery transection using primary TE in a child and also describe the use of endoscopic biliary diversion to limit a significant delayed bile leak.

## 1. Case presentation

The patient is an 8 year-old boy with alpha-1-antitrypsin deficiency who presented to an adult hospital emergency room with severe abdominal pain one hour after falling onto the handlebar of his bike while doing a "wheelie." He was hypotensive with a systolic blood pressure of 80 mmHg and a positive FAST (focused abdominal sonography for trauma) exam. Due to the concern for an abdominal injury, the child was transferred to our institution, a Level 1 pediatric trauma center.

Upon arrival, the patient was tachycardic (HR 120) and hypotensive. On physical exam, he was lethargic with

☆ Disclosures: The authors have no sources of funding or relationships to disclose with respect to this manuscript.
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http://dx.doi.org/10.1016/j.jpedsurg.2013.02.066

ecchymoses on the upper abdomen and was tender to abdominal palpation with moderate distention. There were no other injuries noted. Initial laboratory investigation found a hematocrit of 26.9, a normal coagulation panel, a mild transaminitis (AST 305 U/L, ALT 276 U/L), and a slightly elevated lipase (157 U/L). Following fluid resuscitation, a computed tomography scan was obtained which showed a 4 cm liver laceration involving segments 4A and 4B with evidence of right anterior branch division hepatic artery transection and active contrast extravasation with free fluid in the abdominal cavity (Fig. 1). No other injuries were noted. The patient remained hypotensive, so he was transfused two units each of packed red blood cells, platelets, and fresh frozen plasma. After stabilization, he was taken to the interventional radiology suite for embolization of the injured hepatic artery. The anesthesiologist continued resuscitation throughout the embolization and the operating room was on standby in the event of acute decompensation.

Following initiation of anesthesia, the patient's right common femoral artery was accessed. The proper hepatic artery was catheterized and active contrast extravasation was confirmed from the anterior division of a right hepatic artery supplying segment 4, as well as in the area of the liver laceration (Fig. 2). Two Terumo hypersoft detachable helical coils (0.010" 1.5 mm × 4.0 cm) were deployed to completely occlude the bleeding vessel. No further bleeding was noted after the coils were placed (Fig. 3). The patient was transferred to the intensive care unit in relatively stable condition. The procedure took 1.5 h and the child remained stable throughout.

**Fig. 1** Coronal view: IV contrast enhanced CT of the abdomen show segment IV A/B laceration with a focus of active contrast extravasation from the anterior division of the right hepatic artery. Note the associated hemoperitoneum.

**Fig. 2** Arterial phase AP image of celiac arteriogram show active contrast extravasation from a branch of the anterior division of the right hepatic artery.

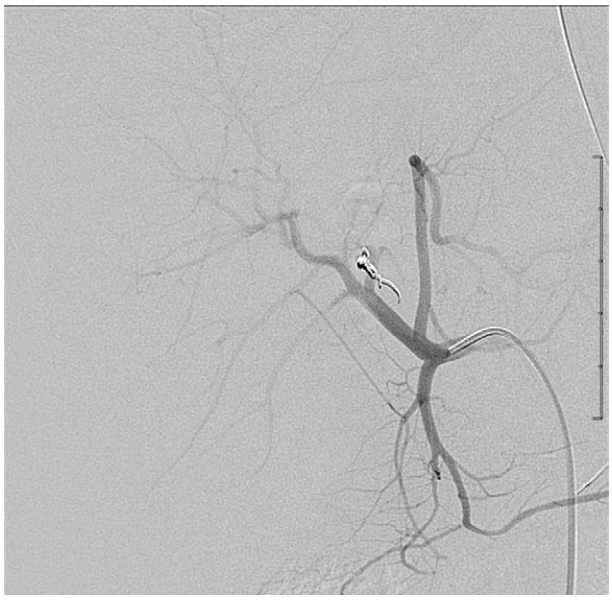

**Fig. 3** AP projection of celiac arteriogram post coil embolization show complete cessation of extravasation and preserved patency of the remainder of the hepatic arterial branches.