

### **Left Hepatic Lobe Infarction in a Ten Year Old Girl**

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**Hepatic infarction is rare, probably due to the dual blood supply by portal vein and hepatic artery. The causes of hepatic artery occlusion include: atherosclerotic, embolus, arteritis, aneurysm, neoplasia, sepsis, shock, general anesthesia and transcatheter embolization for treatment of malignant hepatic tumors. Abdominal trauma rarely leads to hepatic infarction, causing significant morbidity and may require emergency intervention.**

**We are reporting a case of left hepatic lobe infarction developed after blunt abdominal trauma in a ten year-old girl. It was managed successfully by conservative treatment. The sequela of hepatic infarction, in this case, was evaluated by ultrasound.**

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Abdominal trauma is a leading cause of morbidity and mortality among all age groups. Many injuries might not manifest during the initial assessment and might result in missing associated life-threatening injuries<sup>1</sup>. Abdominal trauma could be due to penetrating or blunt forces, which could be classified according to the mechanism of injury into two types: compression forces and deceleration forces.

Compression mechanism usually results from direct blow or external compression against a fixed object like spinal vertebra; the crushing force most commonly causes tears of the capsule covering solid intra-abdominal organs resulting in subcapsular hematoma and small intestinal perforation<sup>2</sup>.

Deceleration mechanism causes stretching and shearing forces between the fixed and the free abdominal organs leading to tear or complete rupture of the supporting ligaments of these organs. Deceleration injuries usually include hepatic tear along the ligamentum teres and intimal injuries to the major arteries, bowel and mesenteric tears<sup>2</sup>.

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The liver and the spleen are the most frequently injured organs, small and large bowels are the next commonly injured organs<sup>2,3</sup>.

A review described trauma as the leading cause of death in those aged 1- 44 years and found traffic accidents, stab wounds, and falls from heights were the leading modes of injury. Blunt abdominal trauma accounted for 79% of cases and the majority of these cases were males with peak incidence occurring in age 14-30 years<sup>4</sup>.

Work-up of blunt abdominal trauma depends on the history, mechanism of injury, physical examination and the radiological findings. Although expensive, CT scan provides the most detailed images of traumatic cases and may assist in determination of the operative intervention, even when sign of peritonitis is absent<sup>5,6</sup>.

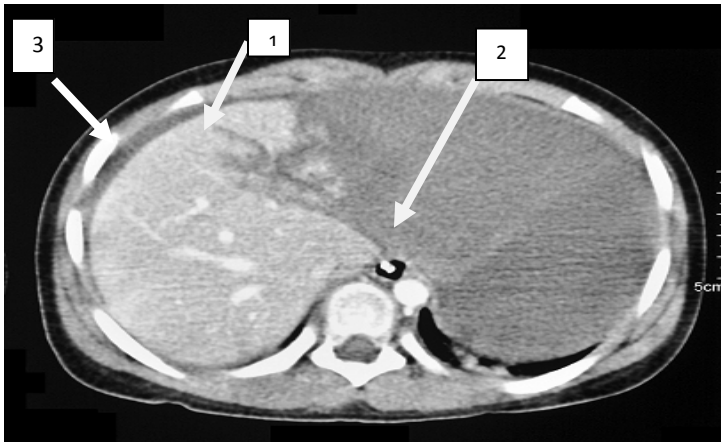
The authors are reporting a rare case of hepatic infarction in a girl after blunt abdominal trauma.

### **THE CASE**

A ten year-old girl sustained a blunt upper abdominal trauma after falling from a swing. On examination, the vital signs were as follow: Pulse 105 beat per minute and blood pressure 100/60 mm/Hg. Abdominal examination revealed tenderness and guarding in the right upper quadrant of the abdomen. The hemoglobin level was 6.7 gm/dL and serum amylase was 323/L. The patient required 90 ml of packed red blood cells, after which the hemoglobin rose to 9.4 gm/dL.

Color Doppler ultrasound and CT scan with contrast demonstrated ischemic infarction of the whole left hepatic lobe, grade three injury of the right lobe of the liver with moderate amount of hemoperitonium. The portal vein was normal, see figure 1.

The patient was managed conservatively and closely monitored in the in pediatric intensive care unit. The patient responded to conservative management; therefore, she was transferred to the general ward after stabilization. Repeated abdominal ultrasound was done after three weeks showed infarcted left lobe of the liver with two small hematomas and central necrosis. The patient had uneventful recovery and she was discharged home.



**Figure 1: CT Abdomen with Contrast Showing Grade Three Injury on Right Liver Lobe (1), Complete Ischemic Infarction of the Left Lobe of the Liver (2), Hemoperitoneum (3)**

## DISCUSSION

Hepatic infarction has been rarely reported in children following blunt abdominal trauma and liver transplant<sup>7,8</sup>. The incidence of hepatic infarction after liver transplant due to thrombosis is 12% in children and 3% in adult<sup>9</sup>. In a review of 118 traumatic injuries of portal triad, hepatic artery was the least commonly injured structure, accounting for only 23% of the injuries<sup>10</sup>. Blunt hepatic injuries most commonly result in pseudoaneurysm formation of hepatic artery and less often lead to occlusion, partial or complete transection<sup>9</sup>.

Patients with hepatic artery injury due to blunt trauma usually present with upper abdominal pain, vomiting and signs of shock in severe cases<sup>11</sup>.

Diagnosis of hepatic infarction, following blunt abdominal trauma is difficult on clinical presentation; the diagnosis can be confirmed during surgery or preoperatively by US, CT scan or angiography<sup>7,9,11-13</sup>. Ultrasound of infarcted native liver initially appear as non-homogeneous areas which might show cystic changes with gas formation after a few weeks of injury<sup>12,13</sup>. CT scan finding of hepatic infarction due to arterial insufficiency are shown as attenuation, peripheral and wedge-shaped areas<sup>14</sup>.

Hepatic infarction after blunt abdominal trauma is more commonly reported in adults and usually managed surgically<sup>7,9</sup>. Tuxen et al reported hepatic artery injury in a child with non-penetrating trauma in 1974, which was managed by laparotomy and hepatic artery repair<sup>7</sup>. Maurizio et al reported hepatic artery transection in eleven year-old girl after a blunt trauma which was managed surgically<sup>11</sup>.

Most traumatic hepatic infarction cases are managed surgically<sup>7,9,11</sup>. Selective hepatic dearterialization could be performed for exsanguinating liver injury without complication<sup>9</sup>. Post transplant liver infarction is treated conservatively in selected cases or by retransplantation<sup>8</sup>.

Complication of hepatic infarction is rare and may occur late in the form of biliary stricture, bilomas and abscess<sup>12</sup>.

In the presented case, the blunt abdominal trauma resulted in complete infarction of the left liver lobe. We successfully managed this patient by conservative method with intravenous fluid, blood transfusion and close monitoring.

## CONCLUSION

**Hepatic infarction is rare after blunt abdominal trauma in children. Radiological evaluation by color Doppler ultrasound, CT scan or angiography is essential for diagnosis. Conservative management is acceptable in stable cases and surgical management is required in complicated cases.**

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