CASE REPORT

ISOLATED HEPATIC ARTERY INJURY FOLLOWING BLUNT ABDOMINAL TRAUMA: CASE REPORT

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ABSTRACT: Injuries to hepatic artery is uncommon, often associated with other abdominal visceral and vascular injuries. They can have a delayed presentation. The diagnosis, management of this condition requires high index of suspicion and surgical expertise. Most of injuries are due to penetrating trauma with blunt abdominal trauma being less common. Isolated hepatic artery injury without any abdominal visceral and vascular injuries is extremely rare. We present a case of isolated injury to the hepatic artery for which we did simple ligation of hepatic artery after achieving haemostasis by pringles maneuver. Post-operative period for the patient is uneventful. We want to emphasize that hepatic artery ligation will not cause major vascular compromise. We want to present this case because for its rarity of an isolated hepatic artery injury.

KEYWORDS: Isolated Hepatic Artery Injury- Blunt Abdominal Trauma – Ligation.

INTRODUCTION: Injury to hepatic artery is rare, uncommon and a usually associated with other abdominal injuries. Most of these injuries are due to penetrating trauma.⁽¹⁾ Among the structures in the porta hepatis, bile duct is the commonest structure to get injured followed by portal vein and hepatic artery.⁽²⁾ In our case, biliary tract and portal vein were normal with isolated hepatic artery Injury following blunt abdominal trauma. We did ligation of the hepatic artery. As liver has dual blood supply, hepatic artery ligation does not cause major vascular compromise to liver, as portal vein will supply the vascular need.^(1,2,3,4)

CASE REPORT: A 42 year old man presented more than 12 hours after a blunt injury abdomen due to road traffic accident with abdominal pain, abdominal distention and dyspnea. Patient was hemodynamically unstable with tachycardia and hypotension. FAST examination revealed blood collection in the peritoneum and around the spleen. Patient was resuscitated and taken for emergency laparotomy. Intra operatively about 4 litres of blood was evacuated from the peritoneal cavity and lesser sac. Active hemorrhage noted in the lesser sac which was controlled by Pringles maneuver.

Hepatic artery proper was found to be completely transected and the cut ends were ligated. Biliary tract and portal vein were found to be uninvolved. No other intra-abdominal visceral or vascular injuries were found. Patient had an uneventful post-operative recovery except for marginal elevation in liver enzymes. He remained well in review, two months post-operatively. This case is being presented because for its rarity. We also want to emphasize that hepatic artery ligation will not cause major vascular compromise to the liver.

DISCUSSION: Worldwide isolated injury to hepatic artery is uncommon. If injury occurs, it is mostly due to penetrating. In 1910, Burton- Opitz reported that the liver could survive on portal blood flow alone because it supply 80% of total hepatic blood flow.⁽²⁾ Trygstrep and co-workers showed that hepatic artery provides 30% of flow with 50% of oxygen delivery.⁽²⁾ Of the three, biliary duct is the

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commonest structure to get injured followed by portal vein and hepatic artery.⁽²⁾ Isolated hepatic artery injury is rare. In the multicenter review of injuries to the portal triad, Jurkovich and associates (1995) reported 100% mortality if all three structures were injured or if both hepatic artery and portal vein were injured.⁽¹⁾

The incidence of vascular injuries in patients with blunt abdominal trauma is 3%.⁽⁵⁾ Since the first repair by Drysdale, overall incidence for trauma to porta hepatis is between 0.2 % -5 %. Blunt abdominal trauma may cause vascular injury by one of the three mechanisms (i) rapid deceleration, as in high speed traffic accidents or fall from height which may cause damage to abdominal vessels by avulsion or intimal tear, (ii) direct antero-posterior crushing in seat belted car passengers or direct blow to abdomen, (iii) direct laceration of major vessels by bone fragments as in severe pelvic fracture.⁽⁵⁾

Various factors have been suggested in the mechanism of blunt trauma to porta hepatis (i) upward shearing force exerted by liver or relatively fixed rigid bile duct, rapid emptying of gall bladder due to increased intra-abdominal pressure, (ii) the rarity of portal vein or hepatic artery injury is explained by their relative higher elasticity, tortuosity and increased length. Intraoperative indicators of porta hepatis injury include bile leak or staining, profuse bleeding from portal vein or hepatic artery. In various literatures, it has been elaborated that for an isolated hepatic artery injury simple ligation of the artery can be done.^(1,2,4)

Though for patients with cirrhosis or severe pre-existing liver disease hepatic artery ligation should be avoided as liver in these patients depends on increased arterial flow.^(1,2) For hepatic artery injury associated with portal vein injury at least one vessel should be preserved, preferably portal vein. There has been 40%-70% mortality if there is a portal vein injury as this delivers 80% of blood to liver.⁽²⁾ Various methods of portal vein repair include lateral repair, end to end anastomosis, grafts, porto-caval shunt. Extensive portal vein injury may require ligation if hepatic artery flow is uninterrupted.⁽³⁾ With associated bile duct injury it can be repaired by primary end to end anastomosis, lateral repair and primary duct enteric anastomosis.

CONCLUSION: Diagnosing the injury to porta hepatis is difficult especially in blunt abdominal trauma, as associated injuries may distract the attention of surgeon. In addition, injuries from blunt trauma may present late. This was highlighted in our case. Bile duct injury is the commonest injury of the porta hepatis followed by portal vein injury and rarely hepatic artery injury. Hepatic artery can be ligated without major compromise to liver whereas portal vein injury needs repair. The diagnosis and management of this condition requires a high index of suspicion and surgical expertise. With accurate diagnosis and prompt surgical treatment, the mortality and morbidity could be reduced.

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Figure 1 : picture shows avulsed hepatic artery with adjacent structures

Figure 2: picture shows unclotted and clotted blood of the patient

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