Case Report

Operative Management of Massive Hepatic Trauma

F FAHIM S FAROOQ
Department of Surgery, K. E. Medical College/Mayo Hospital, Lahore
Correspondence to Dr. Fraz Fahim

Few injuries pose as formidable a challenge to the trauma surgeon as a major hepatic injury. When this combines with a juxtahepatic IVC injury it becomes one of the most life threatening injuries encountered in general surgery. This is a case report of a young male who presented to us in shock with a run over injury with ambiguous signs of peritonitis. Upon doing an exploratory laparotomy, he turned out to have major hepatic and splenic trauma with a lateral rent of juxtahepatic IVC. Hepatic segmentectomy, splenectomy and a repair of IVC were done. The patient survived with minor post op complications, and is now doing well and has resumed his routine daily activities.
Key words: Liver trauma, hepatic trauma, IVC.

While the overall trend in recent years has been toward non-operative management of liver trauma, few injuries pose as formidable a challenge to the trauma surgeon as retrohepatic vena caval and juxtahepatic venous injuries. The daunting mortality encountered with retrohepatic vena cava and juxtahepatic venous trauma is testimony to the difficulties inherent in their management[1] . For a successful outcome, the operating surgeon must be able to rapidly identify the nature of the injury and tailor the choice of procedure accordingly. The ongoing massive hemorrhage in conjunction with the difficult exposure and visualization are enough to cause trepidation in the boldest of surgeons. Adding to the list of difficulties is the knowledge that not only must vascular control be obtained, but also it must be accomplished before irreversible coagulopathy, acidosis, and hypothermia occur[2]. These facts taken together make the high mortality rates (4.7 to 24%) of these injuries understandable[3,4,5,6]. Hepatic or juxtahepatic venous injuries usually present with exanguinating hemorrhage. At the time of exploration, juxtahepatic venous trauma should be suspected when occlusion of the portal triad (the Pringle maneuver) fails to stop bleeding from the liver parenchyma or from below a damaged hepatic lobe.

Case report

A young male of 15 years was rushed to the emergency department approximately one hour after being run over by a vehicle. On admission his Pulse was 110/min, B.P. was 95/65 mm Hg, R.R. was 21/min, Temp. was 37^{0}C and had a GCS of 14/15. He complained of severe pain in the both upper quadrants. On examination he was in some pain and lying supine. He was pale and moderately tender in the upper abdomen, which was distended with absent bowel sounds. There was no bruising or wound on the abdomen. He was resuscitated with 1.5 liters of Ringer's Lactate and his vitals stabilized. He was placed under observation. Serial monitoring revealed a rising pulse and a falling systolic blood pressure. A decision to explore the abdomen was taken.

On exploratory celiotomy, about a liter of blood was evacuated from peritoneal cavity. He was found to have a spleen bleeding profusely from a grade three laceration; splenectomy was done. There was almost a complete transaction and devitalization of a part of liver roughly corresponding to areas 7 and 8 with a massive, expanding right-sided Zone 2 retroperitoneal hematoma. Resection of the devitalized areas was done with cautery dissection and ligation of individual vascular and biliary channels. As the area 8 was lifted off a rent in the juxtahepatic Inferior Vena Cava (IVC) which had been tamponaded previously started hemorrhaging furiously. Massive resuscitation with blood and colloids was immediately started. A side rent in the IVC at the point where it had just emerged from behind the liver was identified and successfully repaired over a Satinsky's clamp with continuos Prolene 5/0. In all he received 7 pints of blood transfusion peroperatively. There was no other injury found. Drains were placed in the Morrison's pouch and in the Splenic bed.

Patient remained critical due to acute anemia and high grade swinging pyrexia since the first post op day. His Hb was built up to 11.3g/dl by multiple transfusions. His pyrexia settled on 7th post op day and the antibiotics were stopped 48hrs later. He initially had heavy drainage of bile from his subhepatic drain to the range of ~700ml / 24 hrs but it decreased steadily over the next few days. This drain was taken out on 10th post op day. Subsequently an USG abdomen on 16th POD showed a collection of 150ml in subhepatic area. Since the patient was asymptomatic, he was discharged on 16th POD. A subsequent USG on 29th POD showed a significant decrease in the size of the collection.

The patient was well two months postoperatively and had resumed his full daily activities. He is on regular follow up.

Discussion

Management of major hepatic trauma and juxta- or retro-hepatic vena caval injuries is one of the most challenging issues faced by the trauma surgeon[7]. These patients often

have exanguinating hemorrhage. This is because of the difficulty in approaching the superior and posterior surface of the liver and the juxtahepatic IVC. Obtaining vascular control in this area is intimidating, especially in an emergency setting[1].

The initial difficulty in this case was whether to operate or not. The current management of major hepatic trauma is at a crossroads. The debate centers around the operative vs. non operative management. According to one study adults without exploration had a significantly higher mortality, which usually occurred before laparotomy could be initiated[8]. Before 1965 and the introduction of diagnostic peritoneal lavage (DPL), up to 50% of hepatic trauma was not diagnosed[1]. After 1965, DPL picked up these "missed" injuries. However, up to half of these missed injuries resulted in nontherapeutic celiotomies. In 1981, computed tomography (CT) was advocated as a better diagnostic tool and nontherapeutic celiotomies began to be reduced. This shift has obviously increased our " non-operative" management[9]. In 2 provocative articles published recently, Strong and colleagues have challenged the trauma surgery community. They contend that there are patients whose livers have been so shattered that survival is dependent on eradication of this "diseased" portion of liver by resection[10,11]. The deteriorating vitals solved this question for us and a celiotomy was initiated. A DPL and/or a CT scan were considered but were not done in view of this clinical situation.

Our prime objective was to minimize hemorrhage and control of hypothermia. This was effectively achieved by meticulous surgical technique and setting a high threshold for transfusions. A conscious effort was made to transfuse only fresh blood.

The take home message from this case would be that major hepatic and juxtahepatic trauma needs to be managed aggressively. The conservative approach in blunt trauma may not always be a wise course since the associated injuries can not always be ruled out. These cases need to be tackled early. And last but not the least clinical judgment of the surgeon should take precedence over all diagnostic adjuncts in such cases.

References

1. Herb Phelan, MD, John P. Hunt, MD, Yi-Zarn Wang, MD, Retrohepatic Vena Cava and Juxtahepatic Venous Injuries, South Med J 94(7): 728-731, 2001
2. Khaneja SC, Pizzi WF, Barie PS, et al: Management of penetrating juxtahepatic inferior vena cava injuries under total vascular occlusion. J Am Coll Surg 1997; 184:469-474
3. Muhammad I, Mabogunje O. Management of Liver Injuries in Zaira, Nigeria. Injury May 1990 21(3):174-6
4. Eisner L. Ackermann C. Regazzoni P. Harder F. Therapy and Prognosis in 102 Liver Injuries. Helvatical Chirurgica Acta Jan 1989; 55(5): 593-6.
5. Chevallier JM Jost JL, Menegaux F, Chigot JP, Vayre P. Hepatic Trauma: Experience of 135 consecutive liver injuries (1982-1989) and arguments for conservative surgery. Langenbecks Archiv
6. Shah P Mohanty S et al. Hepatic Trauma: An Indian Experience. International Surgery. Jul-Sep 1995 80(3): 247-50
7. McNevin S M; Buchman T G, Trauma Surgery pp405-406, The Washington Manual of Surgery, 1999, Lippincott Williams and Wilkins
8. Shin H; Tepas JJ 3rd; Ismail N et al, Blunt hepatic injury in adolescents: age makes a difference. Am Surg 1997 Jan;63(1):29-36
9. Donald Trunkey MD. Nonoperative Management of Hepatic Trauma http://surgery.medscape.com/Medscape/surgery/AskExperts public/ExpertsPanel.html
10. Strong RW. The management of blunt liver injuries. Aust N Z J Surg. 1999;69:609-616.
11. Strong RW, Lynch SV, Wall DR, Liu CL. Anatomic resection for severe liver trauma. Surgery.1998;123:251-57.