CASE STUDY

Nonoperative management for major blunt hepatic trauma in a 3-year-old child

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Abstract

Introduction: Based on hemodynamic stability, non-operative management of low- and high-grade liver injury is the first treatment choice over surgical treatment. Small clinics are still preferring primary operative approach instead of nonoperative one.

Presentation of the case: We are presenting a case (3-year-old male child) of nonoperative treatment of a grade IV blunt liver trauma (lacero-contusive injury of V, VI and VII segments) with massive hemoperitoneum. The patient was put into a conservative treatment with antibiotics, fluids and ½ unit of blood. The results of Computed Tomography showed significant amounts of perihepatic and periileal fluid between the bowels and in the Douglas pouch, which persisted for five days. Laboratory alterations of Serum Glutamic Pyruvic Transaminase, Serum Glutamic-Oxaloacetic Transaminase, and Total Bilirubin reached their maximum values on third day, persisting in decline until fifth day and returned to normal after tenth day. The hospital stay was 11 days, the length of time necessary for the complete conservatory treatment and full recovery of the trauma.

Discussion: More than 80%-90% of liver injuries are managed with nonoperative intervention. Early and late complication can be managed by interventional radiology procedures when it is possible. Success rate of conservative treatment is over 80%.

Conclusion: If no other abdominal injuries are evident and patient is hemodynamically stable nonoperative management for major blunt hepatic trauma in children is the best choice of treatment.

***Keywords**: nonoperative, hepatic trauma, hospital stay*

Introduction

Operative management of severe blunt liver trauma (as the abdominal organ most commonly injured) is often associated with significant morbidity and mortality (1). Despite the difficulty of choosing the right management, nonoperative management of blunt liver injury is currently the treatment modality of choice for hemodynamically stable patients, regardless of the degree of injury or age of the patient (2). Thus, even in paediatric age, surgical interventions for liver injuries are almost history (3). The choice of trauma management is facilitated when the environment offers clinical monitoring and serial exam capabilities and an operating room available for emergency laparotomy (2,4).

University Trauma Hospital is the only centre providing tertiary healthcare in trauma management, so it offers all of the aforementioned capabilities. In this context, a presentation of a case with major blunt liver trauma under non-operatory hospital management conditions was presented.

Presentation of the case

A 3-year-old male child was presented in severe condition in the Emergency Department of the University Trauma Hospital, Tirana, Albania, after a car accident. After the emergency ultrasound was performed, at the time of admission, a considerable amount of perihepatic and periilenal fluid was found between the bowels and in the Douglas pouch. According to laboratory tests, the results showed relevant values: White Blood Cells (WBC) 18.5K/ul, Haematocrit (HCT) 27%, Red Blood Cells (RBC) 3.200 000, Haemoglobin (Hb) 9.2 g/dl, Serum Glutamic Pyruvic Transaminase (SGPT) 198U/L, Serum glutamic-oxaloacetic transaminase (SGOT) 178U/L, and total bilirubin 1.40mg/dl. Regarding hemodynamic, the parameters appear to be stabilized: Arterial Pressure 100/60 mm Hg, V=136 min, and Oxygen Saturation (SAT O2) 99%. Abdominal Computed tomography (CT) reinforces the findings of considerable abdominal perihepatic and periilenal fluid between the bowels and in the Douglas pouch, with a large contusion area of segments V-VI-VII of the liver (Image 1). The patient was put into a conservative treatment with antibiotics, fluids and ½ unit of blood.

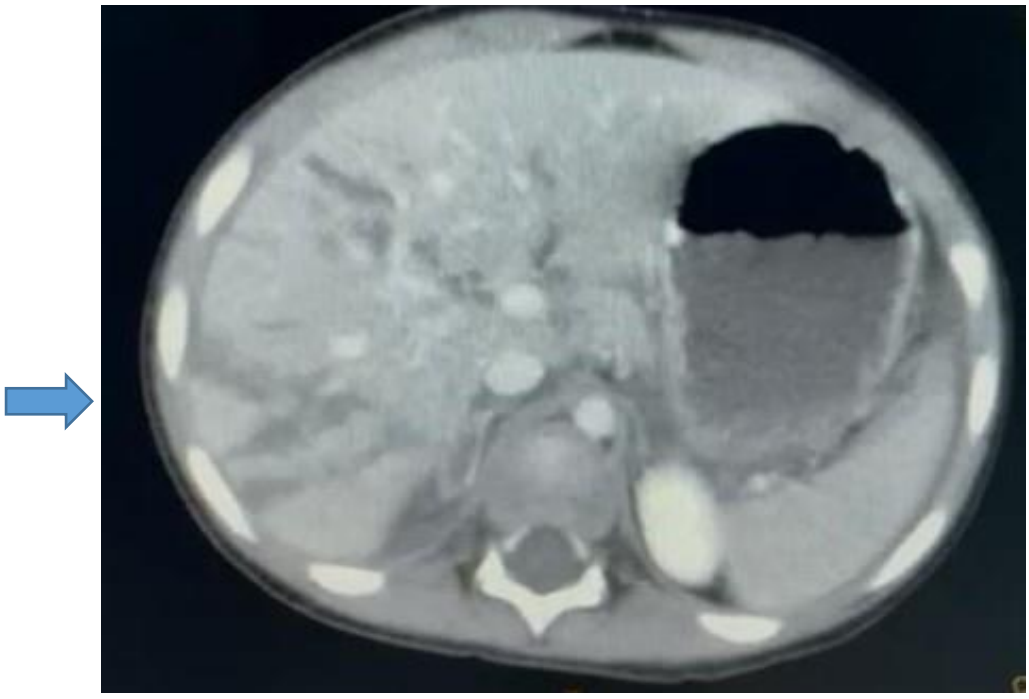

Image 1:CT image, Day 1

After two days, the patient presented with flatulence and painful abdomen. However, the patient continued to have a stable hemodynamic status, while laboratory values are presented as follows: Total Bilirubin 2.4, SGPT 1490 U/L, SGOT 1400 U/l, Amylase 17 U/L, Lipase 7 U/L, WBC 15.2, RBC 3.800 000 and Hb 10.4. In this context, a Contrast-Enhanced CT of the abdomen was performed, the findings of which showed significant amounts of perihepatic and periileal fluid between the bowels and in the Douglas pouch. No active bleeding and no other obvious damage in the abdomen were observed (Image 2).

Image 2: CT image, Day 2

After the third day, the clinical condition remained the same, with the patient having also a sub-febrile temperature of 38 degrees Celsius and the laboratory alterations persisted with the following values: Total Bilirubin 8.7, Direct Bilirubin 5.1, SGPT 2240 U/L, SGOT 198000 U/l, Amylase 17 U/L, Lipase 7 U/L, WBC 18.2, RBC 3.900 000, and Hb 11.0. During the ultrasound, a diminutive quantity of perihepatic and perilenal blood were observed, with a minimum of liquid in Morison, and a considerable amount between the bowels and in the Douglas pouch. After the fifth day, the patient was cannulated, active and fed enterally. The temperature was 37.5 degrees Celsius, the hemodynamic remained stable and laboratory values began to drop to the following values: Creatinine 0.37mg/dl, Total Bilirubin 5.2, Direct Bilirubin 3.0, SGPT 1710 U/L, SGOT 16440 U/l, Amylase 23U/L, Lipase 8 U/L, WBC 15.2, RBC 3.800 000, and Hb 10.4

In the I/V contrast CT abdomen, a small amount of liquid was found between the bowels and in the Douglas pouch and also a minimum of bilateral pleural liquid (Image 3).

Image 3: CT image, Day 5

After the tenth day, the patient was afebrile, without clinical complaints. Nutrition was enteral, laboratory results returned to normal, and imaging tests indicated that there was no free fluid in the abdomen. The hospital stay was 11 days, the length of time necessary for the complete conservatory treatment of the hepatic trauma and full recovery.

Discussion

The most common cause of traumatic liver damage identified in some studies was car accidents (5,6). This factor may be the ethology of injury even in children, as is the case in our study. Studies have demonstrated that severe liver injury (Grade III, IV and V) is associated with increased morbidity and mortality (7). The 3-year-old patient had a grade IV blunt liver trauma (lacero-contusive injury of V, VI and VII segments) with massive hemoperitoneum and severe clinical condition. It has been demonstrated that nearly 80% of patients with liver injury are successfully treated with conservative management (8). In this context, the patient was treated conservatively and, after 11 days in hospital, was able to recover completely. The study of approximately 40,000 patients with liver injury from 405 trauma centres showed that the likelihood of operative therapy for successful treatment of complicated liver trauma was less than 40% (9). Thus, contrary to the surgical treatment's choice, on the side of old scholar surgeons in particular in small clinics, the basis of modern nonoperative management is based on the patient's stable hemodynamic. The main potential drawbacks of non-surgical care in managing blunt liver injury may be delayed bleeding and the omission of related injuries that require surgery (10). By providing the right environment that offers clinical follow-up and the possibility of rapid interventions through interventional radiology of possible complications, non-operative management remains an effective solution even for major blunt hepatic trauma in children.

Conclusion

If no other abdominal injuries are evident and patient is hemodynamically stable nonoperative management for major blunt hepatic trauma in children is the best choice of treatment. Follow-up in appropriate hospital conditions enables the full recovery of the patient and the reduction of hospital stay.

References

1. Croce MA, Fabian TC, Menke PG, Waddle-Smith L, Minard G, Kudsk KA, et al. Nonoperative management of blunt hepatic trauma is the treatment of choice for hemodynamically stable patients. Results of a prospective trial. Ann Surg. 1995 Jun;221(6):744–55.
2. Stassen NA, Bhullar I, Cheng JD, Crandall M, Friese R, Guillamondegui O, et al. Nonoperative management of blunt hepatic injury: an Eastern Association for the Surgery of Trauma practice management guideline. J Trauma Acute Care Surg. 2012 Nov;73(5 Suppl 4):S288-293.
3. Koyama T, Skattum J, Engelsen P, Eken T, Gaarder C, Naess PA. Surgical intervention for paediatric liver injuries is almost history - a 12-year cohort from a major Scandinavian trauma centre. Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine. 2016 Nov 29;24(1):139.
4. Alonso M, Brathwaite C, Garcia V, Patterson L, Scherer T, Stafford P, et al. PRACTICE MANAGEMENT GUIDELINES FOR THE NONOPERATIVE MANAGEMENT OF BLUNT INJURY TO THE LIVER AND SPLEEN. 2003;32.
5. Park KB, You DD, Hong TH, Heo JM, Won YS. Comparison between operative versus non-operative management of traumatic liver injury. Korean J Hepatobiliary Pancreat Surg. 2015 Aug;19(3):103–8.
6. Scollay JM, Beard D, Smith R, McKeown D, Garden OJ, Parks R. Eleven years of liver trauma: the Scottish experience. World J Surg. 2005 Jun;29(6):744–9.
7. Zago TM, Tavares Pereira BM, Araujo Calderan TR, Godinho M, Nascimento B, Fraga GP. Nonoperative management for patients with grade IV blunt hepatic trauma. World Journal of Emergency Surgery. 2012 Aug 22;7(1):S8.
8. Raza M, Abbas Y, Devi V, Prasad KVS, Rizk KN, Nair PP. Non operative management of abdominal trauma – a 10 years review. World Journal of Emergency Surgery. 2013 Apr 5;8(1):14.
9. Yu WY, Li QJ, Gong JP. Treatment strategy for hepatic trauma. Chin J Traumatol. 2016 Jun;19(3):168–71.
10. Norrman G, Tingstedt B, Ekelund M, Andersson R. Non-operative management of blunt liver trauma: feasible and safe also in centres with a low trauma incidence. HPB (Oxford). 2009 Feb;11(1):50–6.