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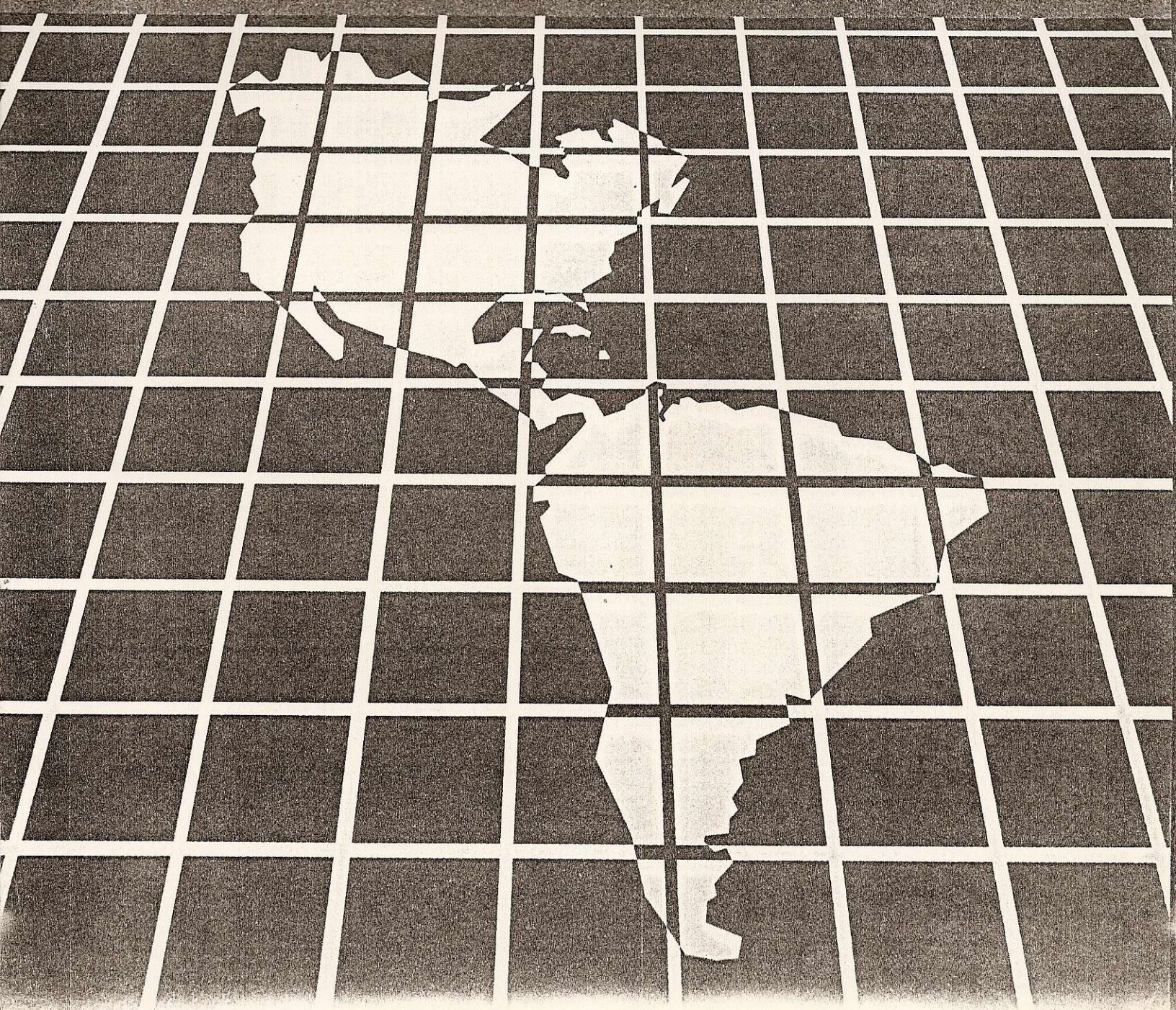

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THE ROLE OF LAPAROSCOPY IN THE NONOPERATIVE MANAGEMENT OF MAJOR BLUNT LIVER TRAUMA

Luis Fernando Correa Zantut, M.D.[1], Marcel Autran C. Machado, M.D.[2], Paula Volpe, M.D.[2], Marcelo JR Lima, M.D.[2], Renato S. Poggetti, M.D.[3], Dario Birolini, M.D.[4]

SUMMARY

The emergency surgical treatment of severe hepatic trauma still carries a high mortality risk. We report a case of severe blunt trauma to the liver managed without surgery under CT guidance. This attitude requires hemodynamic stability of the patient, close monitoring in a surgical intensive care unit and repeated CT scans. Laparoscopy was used to the management of hemoperitoneum due to rupture of hematoma and diagnosis and treatment of bile leakage. Conservative treatment is a reasonable option in selected hemodynamically stable patients with severe hepatic trauma. Laparoscopy is a useful adjunct in the nonoperative management of this condition.

The liver is the most commonly injured organ in abdominal trauma. Operative therapy has been the standard of care for patients with both blunt and penetrating injuries. However, the emergency surgical treatment of severe hepatic trauma still carries a high mortality risk.

The treatment of blunt abdominal trauma has markedly changed in recent years towards a more conservative regimen. In this way, the liver trauma could be managed without surgery under CT guidance. This attitude requires hemodynamic stability of the patient, close monitoring in a surgical intensive care unit and repeated CT scans.

Laparoscopy has been proven to be a useful tool in the evaluation of blunt abdominal trauma. We believe that laparoscopy is useful in addition to the CT scan in the guidance of the conservative management of liver trauma.

CASE REPORT

A 40 year-old female automobile driver was injured in a frontal collision. She was admitted elsewhere hypotensive, alert and oriented. In our emergency department, her systolic blood pressure was 90 mm Hg, her respirations were 30/min and there was no loss of consciousness (RTS = 4.6196; ISS = 21 and TRISSCAN = 0.82). After infusion of 2 liters of Ringer's solution, blood pressure was 120/60. Physical examination noted a marked right upper quadrant tenderness. The examination of the thorax revealed diminution of breath sounds on the lower right side. Chest X-ray showed sixth and seventh rib fractures on the right, but was otherwise normal. Her admission laboratory studies were: hemoglobin, 12.7 g/dl; white blood cell count 11,900/ml; glutamic oxaloacetic transaminase (AST) 672 IU/l; glutamic-pyruvic transaminase (ALT) 259 IU/l; and total bilirubin was 1.3 mg/dl.

Computerized tomography (CT) of the abdomen revealed a large laceration of the right lobe of the liver, with parenchymal hematoma of both right and left

1. Staff Surgeon, Department of Surgery, University of São Paulo, School of Medicine, São Paulo, Brazil.
2. Resident in Surgery, Department of Surgery, University of São Paulo, School of Medicine, São Paulo, Brazil.
3. Associated Professor, Department of Surgery, University of São Paulo, School of Medicine, São Paulo, Brazil.
4. Professor, Department of Surgery, University of São Paulo, School of Medicine, São Paulo, Brazil.
Address for reprints: Dr. Luis Fernando C. Zantut, Av. Brigadeiro Luis Antonio 4521, São Paulo, Brazil, CEP 01401-002. Telefax: 55-11-8848323.

lobes (type IV injury). Intraperitoneal fluid was noted but no other organ injuries were identified. Because of the patient's stability, we decided on a nonoperative initial management under CT guidance.

The patient was admitted to the intensive care unit and was observed on strict bed rest. On hospital day 5, hemoglobin was 10.7 g/dl and total bilirubin increased to 3.5 mg/dl. On postinjury day 7, serum hemoglobin fell to 7 g/dl, requiring transfusion. Physical examination was normal except for mild right upper quadrant abdominal tenderness. Diagnostic laparoscopy was performed and revealed a small amount of perihepatic blood and moderate quantity of bile. Tubular drain with continuous suction was inserted.

Her abdominal tenderness resolved, and she required no further blood transfusion. A repeat CT scan performed on postinjury day 15 demonstrated early resolution of her liver injury. She was discharged asymptomtic with normal liver function tests on thirtieth postinjury day.

DISCUSSION

The liver is the most commonly injured organ in abdominal trauma. Operative therapy has been the standard of care for patients with both blunt and penetrating injuries[1].

The treatment of blunt abdominal trauma has markedly changed in recent years towards a more conservative regimen. It has been shown that the abdominal bleeding following blunt trauma with injury to liver had ceased at the time of laparotomy in more than 50% of all cases and, thus, could be managed without an operation[2]. Although well accepted in pediatric patients, the nonoperative management of blunt hepatic trauma in adults remains controversial in some centers. With the advent of high-quality computed tomography imaging and interpretation, the nonoperative management in selected patients has become a useful alternative.

In general, patients with blunt trauma selected for conservative therapy are hemodynamically stable, or become stable after initial resuscitation. If liver injury is suspected, abdominal CT scan is performed. Computed tomography has been proved to be sensitive and specific for the diagnosis of hemoperitoneum and intra-abdominal injury. Also, ultrasonography has been used for the diagnosis of hepatic trauma. If a liver injury is identified, the patient is admitted to the intensive care unit for strict bed rest and observation. Blood transfusion are given as needed.

The finding of free blood in abdominal cavity *per se* is not an absolute indication for laparotomy. It seems fairly clear that nonoperative management has been, and should be, limited to those patients with, in general, minor liver injuries and without signs of circulatory instability or other intra-abdominal injuries which would require celiotomy.

Several authors concluded that CT demonstration of large parenchymal hematomas or moderate to large hemoperitoneum were *a priori* criteria for surgical intervention despite clinical stability of the patient[3]. The majority of the cases selected for conservative treatment was constituted as mild liver injuries. Severe liver trauma remains an indication for operative management. In the present case, we decided on nonoperative management despite large liver parenchymal laceration because it would require extended resection or a kind of packing if surgical treatment had been chosen. Hepatic resection in trauma has been associated with high mortality rates[4].

Initial experience with the use of abdominal CT in guiding the nonsurgical management of blunt hepatic trauma was first described in 1983. The authors suggested that the extension of hemoperitoneum detected with CT could serve as a guide to dictate the need for surgery. They also concluded that conservative management could be considered if the patient showed stable vital signs and if the hepatic injury demonstrated with CT was limited[5].

Meyer et al.[3] concluded that patients with small parenchyma liver lacerations or intraparenchymal

hematomas and less than 250 ml of hemoperitoneum estimated with the help of CT could safely be treated without surgery. The major features of nonoperative treatment are close hemodynamic monitoring, serial hematocrit measurements, blood replacements as necessary, and the use of abdominal CT scanning to monitor reabsorption of hemoperitoneum and healing of the hepatic injury. Hemoperitoneum reabsorbed significantly by 3-7 days. The persistence of an unchanged volume of intraperitoneal fluid on a follow-up study performed at these time intervals suggested either continuous intraperitoneal bleeding or bile leakage[6].

In this case report, we found an increased intraperitoneal fluid seen on CT with concomitant decrease in the hematocrit. These findings indicated the laparoscopy evaluation of the abdomen.

The use of laparoscopy as a diagnostic tool could reduce the incidence of unnecessary surgical exploration for abdominal trauma in which hemoperitoneum exists[7]. In our case, the laparoscopy revealed the rupture of the liver hematoma, no active bleeding and the presence of biliary leakage. These conditions had been successfully managed with closed drainage under laparoscopy guidance.

Our favorable experience in this case had led us to suggest an algorithm for selective management of patients with blunt hepatic trauma. We conclude that conservative treatment could be a reasonable option in selected hemodynamically stable patients with severe hepatic trauma and laparoscopy constitutes a useful adjunct in the nonoperative management of this conditions.

RESUMEN

El tratamiento de urgencia del trauma hepático severo todavía tiene un riesgo alto de mortalidad. Se informa un caso de trauma hepático cerrado severo, que se manejó bajo guía tomográfica, sin cirugía. Esta actitud clínica requiere estabilidad hemodinámica del paciente, estrecha monitoría en una unidad de cuidados intensivos y tomografía computadorizada repetida. Se utilizó laparoscopia para el manejo del hemoperitoneo debido a la ruptura de un hematoma así como para el diagnóstico y tratamiento de la fuga de bilis. El tratamiento conservador es una opción razonable en pacientes seleccionados hemodinámicamente estables con trauma hepático. La laparoscopia es una medida adjunta útil en el manejo no operatorio.

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