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Management of liver injuries

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Abstract

The liver is one among the foremost frequently injured organs in abdominal trauma. The anterior location within the abdomen and fragile parenchyma with easily disrupted Glisson's capsule make this organ susceptible to injury. There is a paradigm shift within the management of liver trauma thanks to advancements of diagnostic and therapeutic modalities. a few century ago, Pringle conducted an animal experiment, occluding the orifice in liver trauma while repairing the injuries. However, application of an equivalent principle in trauma victims led to high mortality. Since 1965, the introduction of diagnostic peritoneal lavage (DPL) has led to several nontherapeutic laparotomies in previously unsuspected low-grade injuries. Operative intervention in high-grade injuries may end in high mortality also.

Keywords: parenchyma, Peritoneal lavage, Abdominal trauma

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Introduction

Introduction of computerized tomography (CT) scan, use of ultrasonography in trauma, availability of angiography, enhanced critical care monitoring and control surgery have revolutionized the management of liver trauma. Numerous studies have shown better outcome with conservative management. Though there's a broader consensus regarding the nonoperative approach even in high-grade injuries, however, some controversies still exist.

Diagnosis

Ultrasonography

Ultrasonography may be a noninvasive procedure and highly operator-dependent. Focused assessment by ultrasound for trauma (FAST) has been advocated in initial trauma evaluation. The aim of this exam is to supply a fast bedside assessment for hemoperitoneum and hemopericardium. a quick exam consists of sonographic evaluation of pericardium, right upper quadrant, including Morrison's pouch, left upper quadrant and therefore the pelvis. This evaluation isn't designed to spot the degree of organ injuries, but rather the presence of blood. The sensitivity and specificity of this examination are 63–100% and 95–100%, respectively. Negative FAST examination doesn't exclude intra-abdominal injuries or hemoperitoneum. Retroperitoneal injuries and hollow viscus injuries also can be missed by ultrasound evaluation.

Recent advancement of contrast-enhanced sonography improved the diagnostic accuracy in terms of conspicuity, size and completeness of the injury, as compared to non-contrast.

Computed tomography scan

CT scan is that the first imaging study which provides relatively detailed delineation of solid organ injuries and retroperitoneal injuries also. CT scan is that the standard imaging study for hemodynamically stable patients following injury. Severity of injuries is additionally graded supported CT scan examination. Extravasation of contrast demonstrated on CT scan (35–40 HU) indicates active bleeding from the injury site and further intervention is required.

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CT scan plays an integral role within the nonoperative management of liver injuries. Follow-up CT scan is suggested for high-grade injuries (grades IV–V) in 7–10 days to work out the injury status and complications also. CT scan-guided percutaneous drainage can also be performed when complications like biloma and intra-abdominal collections occur.

Angiogram and angioembolization

Angiography plays an important role within the conservative management of the liver injury. Extravasation of contrast seen on CT scan requires emergency angiography and angioembolization in hemodynamically stable patients. Post-operative angioembolization is additionally reported in control surgery before removal of packing, if rebleeding is suspected. The sensitivity and specificity of angiogram identifying active bleeding in liver injuries is 75% and therefore the success rate of controlling the hemorrhage is 68–93%. The multidisciplinary approach to conservative management of high-grade liver injuries shows better outcome with less transfusion, early recovery time and fewer medical care days. The mortality is low also.

Diagnostic peritoneal lavage

DPL was one among the foremost common modalities utilized in the diagnostic evaluation for blunt abdominal trauma within the mid-20th century. This procedure is extremely sensitive for hemoperitoneum. Positive DPL led to a rate of just about 30% non-therapeutic, unnecessary laparotomies. Widely available CT scans and therefore the introduction of FAST have generally replaced the invasive DPL. However, the Advanced Trauma Life Support course (ATLS) still includes this modality and it remains one among the talents that physicians got to learn for ATLS certification.

Management

Penetrating injury

Recent literature supports operative intervention only in hemodynamically unstable patients, usually as a result of a high-velocity gunshot wound.

Other indication for operative intervention is an associated hollow viscus injury.

Trunkey has described the operative procedure for unstable gunshot wounds to the liver. If the patient is unstable or deteriorating within the ER, patients should be taken to the OR within quarter-hour. Activation of massive transfusion protocol, four quadrant packing, direct compression and rapid control of fecal contamination are the initial steps. Debridement, ligation of the bleeding vessel, lobectomy and repair of venous injury under total vascular isolation are the simplest strategies with good outcome.

If the triad of coagulopathy, acidosis and hypothermia are encountered during this phase of the repair, perihepatic packing and temporary closure of the abdominal incision with transfer to medical care unit (ICU) should be the priority. The patient should be taken back to OR as soon because the metabolic derangement is corrected and rewarming has occurred.

Blunt injury

The main indication of the operative approach to the blunt liver injury is hemodynamic instability, not the grading of the injury. Although a better grade injury has higher potential for failure of nonoperative management, hemodynamic instability remains the foremost important branch of the choice tree indicating operative intervention.

Rebleeding, constant decline of hemoglobin and increased transfusion requirement, also because the failure of angioembolization of actively bleeding vessels are a couple of factors which indicate the necessity forlaparotomy.

The operative approach has also evolved over the last 20 years. Direct suture ligation of the parenchymal bleeding vessel, perihepatic packing, repair of venous injury under total vascular isolation and control surgery with utilization of preoperative and/or postoperative angioembolization are the well-liked methods, compared to anatomical resection of the liver and use of the atriocaval shuntation.

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