Blunt Abdominal Trauma
Evaluation and Management

Essay
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List of Abbreviations

AAST	American association for the surgery of Trauma
AIS	Abbreviated injury scale
BAT	Blunt Abdominal Trauma
CT	Computed Tomography
DPL	Diagnostic Peritoneal Lavage
ED	Emergency Department
FAST	Focused Abdominal Sonogram For Trauma
GCS	Glasgow Coma Scale
HU	Houns Field Unite
ICU	Intensive Care Unite
ISS	Injury Severity Scores
OIS	Organ Injury Scale
OPSI	Over Whelming Post Splenectomy Infection
SNOM	Selective Non Operative Management
SP	Survival Probability

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INTRODUCTION

Trauma is the leading cause of death in people under the age of 45 years, and 10% of these deaths result from abdominal injury which may be blunt (84%) or penetrating (16%). Early detection of these life-threatening injuries is the most important factor in decreasing the incidence of death due to intra-abdominal trauma **(Gonzalez et al., 2000).**

Physical examination traditionally is an important tool in the assessment of the general status of the patient. Recently, abdominal ultrasound has been more commonly used in the detection of intra-abdominal haemorrhage due to blunt trauma. Some characteristics of ultrasonography, such as speed, repeatability, non-invasiveness and bedside availability, have made it the preferred initial diagnostic investigation in suspected abdominal trauma in emergency departments **(Mckenney et al., 1996).**

Early non-invasive monitoring identifies hemodynamic deficits as soon as the patient enters the emergency department. Time is an important factor in the resuscitation and expeditious management of acute emergency patients because delay in correcting circulatory deficiencies of shock and trauma lead to organ failures and death **(Shoemaker et al ., 2005) .**

A variety of tests are used to identify abdominal bleeding in blunt multitrauma patients including ; clinical examination, focused assessment with sonography for trauma, computed tomography and diagnostic peritoneal lavage **(Miller et al., 2003).**

Ultrasonographic imaging is non-invasive, inexpensive, and readily available at the patient's bedside. Consequently, at many institutions it has essentially replaced diagnostic peritoneal lavage for detection of intraperitoneal fluid. In experienced hands, the focused assessment with sonography for trauma examination has been shown to be both sensitive and specific for detecting hemoperitoneum in victims of blunt abdominal trauma. Previous studies have shown the sensitivity of the focused assessment with sonography for trauma for detecting hemoperitoneum in victims of blunt abdominal trauma to be between 63% and 100%, and the specificity of the focused assessment with sonography for trauma examination to be between 90% and 100% **(Mc Gahan et al., 2002).**

Computed tomographic scan is considered as the most reliable method for diagnosis of Blunt bowel and mesenteric injuries, although a series reports a 10% to 15% false-negative rate. The use of oral and rectal contrast material is controversial because the risk of aspiration may be significant, and this seems to be of small diagnostic gain. The CT signs suggestive of blunt bowel and mesenteric injuries have been described .The most specific sign of bowel rupture is extravasated oral contrast material, but this is rarely observed. Other findings include pneumoperitoneum, bowel wall thickening, mesenteric hematoma, mesenteric fat streaking , free intraperitoneal fluid, especially in an interloop location , and bowel wall enhancement with intravenous contrast **(Fakhry et al., 2003).**

Minimally invasive surgery has become widely used in pediatric surgery because of technological advances and surgeon familiarity. There have been limited studies in the adult trauma literature that have shown laparoscopy to be an effective modality for evaluation of abdominal trauma and the treatment of injuries to solid organs and hollow viscera . As comfort with and frequency of laparoscopy in the setting of trauma increases, the rate of negative laparotomies decreases **(Leppaniemi and Haapiainen., 2003).**

Traditional philosophy regarding blunt abdominal trauma has adhered to the adage that visceral injuries are best treated by surgical management. In the past 20 years, however, there has been a revolution in thought, with progressively increasing use of Selective non operative management . Selective non operative management is currently the treatment of choice at level I trauma centers, reportedly employed in close to two-thirds of patients with confirmed solid organ injuries **(Shapiro et al., 2001).**

Operative management for splenic and hepatic injuries. Overall, the most significant factor is hemodynamic stability, defined as a persistent systolic blood pressure>90 mm Hg. Patient selection has a large impact on the success of selective non operative management. In those presenting with a lower blood pressure, stabilization may be achieved by fluid resuscitation (maximal crystalloid infusion of 2 L) or through the transfusion of up to 2 units of packed red blood cells. Further transfusion requirements or a falling hemoglobin are indicative of ongoing hemorrhage and should prompt consideration of repeat CT scan with surgical intervention if uncontrolled bleeding from the visceral injury is confirmed **(Pachter et al., 1998).**

Aim of the work

The aim of this work to assess the value of preoperative evaluation of patients presented by blunt abdominal trauma in decision making.

ANATOMY OF THE PERITONEAL CAVITY

ABDOMINAL CAVITY

The abdominal cavity is much more extensive than the impression gained from examination of the anterior abdominal wall. Much of it lies under cover of the lower ribs, for the domes of the diaphragmatic arch high above the costal margin. Liver and spleen, much of the stomach, and the upper poles of the kidneys and both suprarenals are hidden by the lower ribs **(sinnatomby,1999).**

THE PERITONEAL CAVITY

The parietal and visceral layers of peritoneum are in contact, the potential space between them being the peritoneal cavity. This consists of: (1) a main region, the greater sac, and (2) a diverticulum, the omental bursa or lesser sac behind the stomach and adjoining structures; the two communicate via the epiploic foramen **(Snell,1992).**

VERTICAL DISPOSITION OF THE PERITONEUM

It is convenient to commence tracing the arrangement of the greater sac in the vertical plane from the anterior abdominal wall at the umbilical level. A fibrous ligamentum teres (obliterated left umbilical vein) ascends from this to the inferior surface of the liver, inclining slightly right and receding from the abdominal wall as it ascends, raising a triangular falciform hepatic ligament of parietal peritoneum from the wall and inferior diaphragmatic surface. The falciform ligament has right and left peritoneal layers with intervening connective tissue. Its juxta-umbilical region has a posterior free border from the umbilicus to the inferior hepatic surface, containing the ligamentum teres. Superiorly the falciform ligament extends from the diaphragm to become continuous with the visceral peritoneum on the hepatic anterosuperior surface . **(Moore,1992)**.

The visceral peritoneum on the anterosuperior hepatic surface continues round the sharp inferior hepatic border to the inferior (visceral) surface, where it is arranged as follows; right of the gallbladder it covers the inferior surface of the right lobe of the liver and is reflected posteriorly to the right suprarenal gland and the upper pole of the right kidney, forming the inferior layer of the coronary ligament, it often passes direct from the liver to the kidney as the hepatorenal ligament. From the right kidney it descends to the front of the first part of the duodenum and right colic flexure; it also passes medially in front of a short segment of the inferior vena cava (between the duodenum and liver), continuing onto the posterior wall of the omental bursa. Between the two layers of the coronary ligament is a large, triangular, posterior area on the right hepatic lobe devoid of peritoneal covering, the bare area of the liver, where the liver is attached to the diaphragm by areolar tissue**(Susan et al.,2005)**.

Near the right hepatic margin layers of the coronary ligament converge fusing to form the right triangular ligament which connects the right hepatic lobe to the diaphragm and forms the apex of the bare area, the base being the groove for the inferior vena cava**(Susan et al.,2005)**.