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BLUNT ABDOMINAL TRAUMA

Essay

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اصابات البطن الغير نافذة

رسالة

توطئة للحصول على درجة الماجستير
فى الجراحة العامة

مقدمة من

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SUMMARY

Blunt abdominal trauma continues to be the most common cause of injury to the abdomen, the failure to manage abdominal injuries successfully accounts for the majority of preventable deaths following multiple injuries, failure to recognize intra-abdominal hemorrhage and to successfully control bleeding from intra-abdominal organs leads to significant morbidity, there are many mechanisms that account for abdominal injuries, the recognition of it is of great importance for treatment and diagnostic work-up.

The liver and spleen seem the most frequently injured organs, although reports vary, small and large intestines are the next most injured organs, respectively. Recent studies show an increased number of hepatic injuries, perhaps reflecting increased use of CT scanning and concomitant identification of more injuries.

Initial management of patients with blunt abdominal trauma i.e. resuscitation and dearly care of traumatized patients aims to identify and correct any immediate life threatening condition, priorities include airway, cervical spine contour, breathing, and circulation, and hemorrhage control, dysfunction of the central nervous system and exposure of the patient, diagnosis can be done by one or more of the following modalities:

1. Clinical examination.
2. Laboratory investigation.

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INTRODUCTION

Injury to the abdomen is a common occurrence in everyday practice world wide in both military and civilian practice. The morbidity and mortality from these injuries remains high especially when there is delay in diagnosis or treatment. Delayed diagnosis or missed diagnosis is more common in the blunt injury group compared to the penetrating injury group which are obvious and the response is prompt. In developed countries, morbidity and mortality rates have been reduced as a result of improved safety standards, advances in diagnostic imaging techniques, patient monitoring devices, prompt intervention often in specialized trauma centers among other factors. In developed countries, however, the outcome of blunt injuries to the abdomen is still affected by late presentation to the hospital, poor diagnostic facilities, poor resuscitation measures and sometimes late commencement of treatment.[1]

Blunt abdominal trauma usually occurs due to road accidents, fall from heights or during sports. In these injuries liver or spleen are the most vulnerable organs while pancreatic injuries are rare. The kidneys are vulnerable to blows or kicks to the sides of the abdomen, injuries to internal organs in blunt abdominal traumas occur either due to forces of blows from front or an external force on a static organ. These forces result in tears and hematomas of solid or hollow organs.[2]

Speedy and accurate diagnosis and treatment can play an important part in determining the fate of these patients, after initial resuscitation and primary evaluation, secondary measures for diagnosing damage to each organ should be under taken immediately.(2)

The abdomen of trauma victims is routinely evaluated with physical examination. However, physical examination may be misleading in patients under the influence of alcohol or illicit drugs. It is also unreliable in patients with associated injuries to the head or spinal cord. Diagnostic peritoneal lavage (DPL), focused abdominal sonography for trauma (FAST), and computed tomography (CT) are typical tests used for abdominal evaluation in trauma, FAST has been shown to be as accurate as DPL and CT in the detection of haemoperitoneum after abdominal trauma.(3)

Ultrasonography (USG` is a non invasive procedure which is also used to evaluate for the presence of fluid in the abdomen, it has a high specificity for diagnosing damage to the solid organs and for the presence of fluid and has a low cost.(2)

CT imaging is the diagnostic tool of choice for the evaluation of abdominal injury due to blunt trauma in haemodynamically stable patients, CT scans can provide a rapid and accurate appraisal of the abdominal viscera, retroperitoneum and abdominal wall.(4)

Laparoscopy can be performed safely and effectively in stable patients with abdominal trauma, the most important advantages are reduction of the nontherapeutic laparotomy rate, morbidity, shortening of hospitalization, and cost-effectiveness.[5]

The hemodynamically stable or easily stabilized trauma patient can be admitted in a non-ICU ward with the provision of close monitoring, splenic injury especially with multiple-site free intra-abdominal fluid in abdominal computed tomography carries a high risk for non operative management (NOM) failure, in this series, the main criterion for a laparotomy in a NOM patient was hemodynamic deterioration after a second rapid fluid load.[6]

AIM OF THE WORK

Better understanding the pathogenesis of blunt abdominal trauma, discussing the new trend in its diagnosis and management, aiming to decrease its morbidity and mortality.

PATHOPHYSIOLOGY OF BLUNT ABDOMINAL TRAUMA

Trauma is one of the main health problems in all countries irrespective of their economic status, each year, 60 million people world over loose their lives due to trauma. About one sixth of the patients admitted in hospitals are due to trauma, from the economic point of view, trauma inflict severe expenditure on the health care system.[2]

In 1985, it was estimated that 158 million dollars were spent in the USA on trauma patients. The most appropriate and important group for evaluating the complications and death rate due to trauma are patients who die within 24 hours of the trauma speedy, and accurate diagnosis and treatment can play an important part in determining the fate of these patients. After initial resuscitation and primary evaluation, secondary measures for diagnosing damage to each organ should be under taken immediately.[2]

Mechanisms of trauma:

Trauma is best categorized by utilizing three main descriptors: (i) the mechanism of injury, (ii) the biomedical forces that created the wound(s), and (iii) the intent of injury. All three classifications bear directly on the type, severity, and outcome of the injury.[7]

Trauma mechanisms include mechanical, thermal, electrical, radiation, and blast (a form of mechanical injury). For each of these mechanisms, there are precipitating agents or vectors that produce injury. Mechanical injury can result from blunt force or penetrating trauma. Examples of blunt trauma include motor vehicle crashes, pedestrians struck by a motor vehicle, and falls.[8]

The degree of tissue destruction is directly proportional to the amount of energy absorbed by the tissues. The biomechanical forces of injury can be described, in physical terms, as force vectors of energy transmission that result in tissue injury.[9]

Subclassification of blunt trauma

Forces:

a. Direct impact/compression:

The biomechanical forces that result in blunt trauma are most commonly due to rapid deceleration or acceleration. Either an object that is already in motion strikes the victim or the victim is in motion and strikes another object, a motor vehicle striking a pedestrian is an example of the former and motor vehicle with occupant striking an immovable object, such as a tree, is an example of the latter. In both of these examples, the victim may sustain a soft tissue injury, bony or intracavitary injuries, injuries to the cervical spine and upper extremity joints are often caused by distraction forces such as hyperflexion or hyperextension.[10]

b. Shear:

Shearing forces make organs and tissue planes move relative to each other, tearing communicating structures and blood vessels. The force can be caused by deceleration or acceleration and as a result is most often associated with high-speed road traffic accidents (RTAs) and high falls. After impact, organs continue to move forward on their points of attachment causing them to tear. Aortic rupture in a high-speed RTA is a good example, the descending aorta being fixed but the arch being free and unsupported. Severe deceleration can make the arch shear off from the descending aorta, causing an injury that is most often fatal within seconds.[11]

Incident:

1. Motor vehicle crashes (MVCs):

When caring for patients received from the scene of a motor vehicle crush, it is important for the healthcare provider to collect basic, essential information, this includes details about the speed of the vehicles, the points of impact sustained. It is also important to determine whether the patient was the driver or passenger, front or backseat occupant, and whether any safety devices were used and/or deployed during the crash, if the patient was ejected from a vehicle, it is important to determine where the patient was found in relation to the location of the vehicles, the mortality rate greatly increases, and injury

prediction becomes extremely difficult in the event of patient ejection from an enclosed vehicle. It is also important to determine if any other occupants in the same vehicle were killed.[12]

2. Pedestrians Struck by a Motor Vehicle:

Approximately 15% of all injuries in the motor vehicle category are caused by motor vehicles striking pedestrians, the case fatality ratio was 9%, making pedestrian injuries the most lethal of all types of motor vehicle-related injuries. Approximately, 60% of the pedestrians were struck as they attempted to cross a street, twice as many injuries occurred when the victim was crossing the street between intersections. Another 8% occurred while pedestrians were walking along the road side.[13]

3. Motorcycle crashes:

Common injury patterns that are associated with specific types of impacts are:

A. Head-on collision:

Femur fractures are common. Also if thrown over the handlebars, face and chest injuries are likely.[13]

B. Angular collision:

Crush injuries of the lower extremities and open or closed leg fractures are commonly seen.[14]