EM CASE OF THE WEEK.

BROWARD HEALTH MEDICAL CENTER
DEPARTMENT OF EMERGENCY MEDICINE

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Care Warriors

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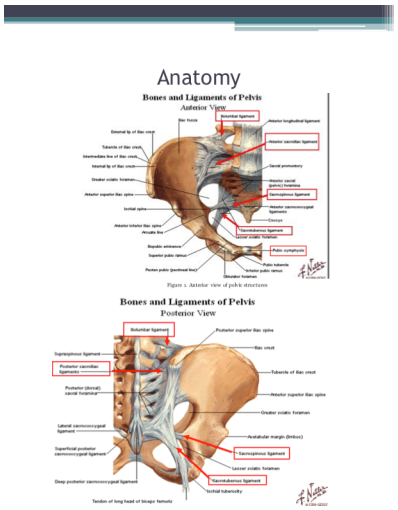
Pelvic Fracture

- The victim of a MVA who was in shock is delivered to your trauma center by ambulance. On exam, his BP is 80/60 mmHg and he has an unstable pelvis. X-rays reveal a pelvic fracture. Chest x-ray is normal. FAST exam shows free fluid near the spleen. There are no major extremity deformities noted. A pelvic binder is placed and fluids are administered. Which is the next best step in management of this patient?

  - A. CT of the chest
  - B. CT of the abdomen and pelvis
  - C. Angiography
  - D. Exploratory laparatomy with pelvic packing
  - E. Diagnostic peritoneal lavage



Pelvic fractures are generally associated with high energy blunt trauma, most commonly by MCC, MVC, falls, and pedestrian struck by MV. High energy trauma increases the likelihood of internal injuries to the abdominal and pelvic viscera.

The two figures above show the anatomy of the pelvis with areas of potential injury.

EM Case of the Week is a weekly "pop quiz" for ED staff.

The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.

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The correct answer is **D**. Free fluid was detected with the FAST exam, so the source of potential bleeding must be located and addressed.

Discussion

Pelvic fractures are associated with increased mortality in trauma patients, with an overall mortality rate of 5-16%. Part of the danger lies in the need to rule out serious associated injuries. These can include significant retroperitoneal hemorrhage, intra-abdominal injury, nerve injury, and damage to surrounding structures such as rectum, bladder, urethra, prostate, vagina, uterus, and ovaries.

Several types of fractures exist.

1. Pelvic ring disruption: this may present as an open-book fracture with anterior injury and posterior fracture or ligamentous injury. There is an increased risk of hemorrhage. The ring is also subject to injury from lateral compression, anteroposterior compression, and vertical shear.
2. Sacral fracture: carries an increased risk of neurologic injury due to close proximity of the plexus and other nerve structures.
3. Acetabular fracture
4. Avulsion fracture: more commonly seen in young athletes

Of note, the extent of bleeding may not correlate with the severity of the fracture pattern! In other words, a fracture that appears minor on imaging may in fact be associated with significant hemorrhage.

Figure 1. Open book pelvic fracture (http://img.medscape.com/pi/emed/ckb/radiology/336139-394515-

Initial management

As in all cases involving trauma, the initial steps in management include assessment of ABC's. The next most appropriate step is to conduct the FAST exam, the results of which will determine the rest of management. The test is highly specific, so a negative exam in an unstable or critical patient still warrants continued suspicion for injury.

A diagnostic peritoneal lavage (DPL) can be used when the results of the FAST exam are unequivocal or negative, and the cause of the patient's hemodynamic instability remains unclear. A positive result is considered to be an aspirate of 10mL or greater of gross blood. The DPL has been used less frequently as other modalities of assessment have become standard. In particular, CT is the gold standard method of evaluation as long as the patient is hemodynamically stable. It is able to show concomitant intra-abdominal bleeding, injury, and the extent of the hemorrhage.

If a pelvic injury is suspected or confirmed, an initial placement of a pelvic binder is appropriate. The pelvis should be wrapped with a sheet or commercial binder, or legs tied in internal rotation. This reduces pelvic volume via a tamponade effect, stabilizes fracture fragments, and thus reduces hemorrhage.

The definite treatment options will consist of operative stabilization, pelvic packing, or angiography with embolization.

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Complications of Pelvic Fractures

1. Urethral injury: usually in men, may present with **blood at the meatus**, **scrotal hematoma**, hematuria, high-riding prostate on rectal. DO NOT insert Foley! DO **retrograde urethrogram** first if suspected

2. Bladder injury: diagnose with **retrograde cystogram**. For extraperitoneal leaks place a Foley and repeat imaging. For intraperitoneal leaks, surgical repair with suprapubic cystostomy is indicated.

3. External genitalia injury: testicular rupture or torsion, penile fracture, vaginal hemorrhage and fistula formation. When pelvic fractures are present, careful physical exam with inspection is needed.

4. Intra-abdominal injury to viscera, bowel: CT is the primary diagnostic test. Perform FAST to look for free intraperitoneal blood. Positive findings in an unstable patient are an indication for emergent laparotomy.

Take Home Points

- Pelvic fractures are serious injuries, with the most common and dangerous association being hemorrhage
- Based on a history of high impact trauma, suspicion should be high
- FAST exam for fluid
- CT is the imaging of choice for hemodynamically stable patients
- Immobilize significant pelvis injuries

ABOUT THE AUTHOR

This month's case was written by Linda Yue. Linda is a 4th year medical student from FIU HWCOM. She did her emergency medicine rotation at BHMC in February 2017. Linda plans on pursuing a career in Internal Medicine after graduation.

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