

Best Practice Guideline – Pelvic Fractures

Pelvic fractures is one of the potentially life threatening injuries identified during the primary trauma assessment. The prevalence of pelvic injuries in studies of patient with blunt force trauma continues to be between 5% and 12% roughly. Early suspicion, identification and proper management of a suspected pelvic fracture in the prehospital setting is the key to reducing blood loss in the field. A key marker for the suspicion of pelvic injuries continues to be the transfer of considerable energy or severity of injury, and allows for appropriate triage of patients. The mortality rate from pelvic fractures in patients who reach the hospital is between 7.6% - 19%. Although hemorrhage from pelvic fractures, which can be upwards of 2 to 3 liters, is a concern, other injuries from the considerable transfer of energy may also contribute to the cause of death in these patients. The mortality from open pelvic fractures is much higher and approaches 50%. Whether internal or external, hemorrhage controls remains the key factor in a positive outcome for trauma patients.

I. Pre-hospital (EMS) Management

- a. Triage/Transportation
 - i. Assure scene safety
 - ii. Primary trauma survey to identify life-threatening injuries
 - iii. Transport to the most appropriate trauma center based on these considerations
 1. Transport time/distance to include factors of weather and geographic barrier
 2. Level 1 and 2 trauma centers provide equivalent clinical care
 3. Level 3 centers provide important stabilization services in rural/frontier areas
 - iv. Transfer to higher level of trauma center with specialized orthopaedic capabilities.
- b. Treatment
 - i. Maintain vital signs – consider a permissive hypotensive resuscitation strategy if not a concomitant trauma brain injury
 - ii. Avoid repeat examination of pelvis once injury is identified
 - iii. Consider Tranexamic Acid (TXA) – 1 gram; IV if hemodynamically compromised
 - iv. Immobilization
 1. Adduct and internally rotate the lower extremities together and secure
 2. Wrap a sheet (or designed “pelvic binder”) around the greater tuberosities of the femurs (low around the hips) and secure tightly.
 3. Alternatively, an inverted Kendrick Extrication Device (KED) can be applied if a sheet is not available
 4. Avoid excessive movement of the pelvis and utilize a “scoop” stretcher to move the patient onto the stretcher mattress.

II. Hospital Management

- a. *Hemodynamically Stable patient*
 - i. Obtain AP pelvis radiography (PXR)

- ii. Place the patient into a temporary external “pelvic binder” if the PXR suggests a fracture pattern with a high index of suspicion of hemorrhage
- iii. Obtain cross-sectional (CT scan) imaging with contrast of the pelvis to determine fracture pattern and to identify contrast extravasation (bleeding).
- iv. Early consultation with an Orthopaedic Traumatologist, or the consideration to transfer the patient to a comprehensive trauma center.

b. *Hemodynamically Unstable patient*

- i. Perform a FAST exam (or diagnostic peritoneal aspiration [DPA]) to rapidly exclude other sources of potential, intra-peritoneal hemorrhage.
- ii. If peritoneal hemorrhage is diagnosed, proceed to the hybrid operating room for exploration with concomitant external pelvic fracture fixation. If peritoneal hemorrhage is not diagnosed then proceed with the following.
- iii. Place the patient into a “pelvic binder” device to temporarily stabilize the pelvis
- iv. Early consideration for activation of the massive transfusion protocol and obtaining a thromboelastogram sample (TEG or ROTEM).
- v. Consider Tranexamic Acid (TXA); 1 gram IV within 3 hours of injury if EMS has not already given the initial dose.
- vi. Maintenance of perfusion
- vii. Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) for those patient *in extremis* from pelvic hemorrhage should be considered prior to the operating room or angiography suite.
- viii. Activation of the interventional radiologist and team for a formal angiogram if any of the following is noted:
 - 1. Contrast extravasation on CT angiogram
 - 2. Significant hemorrhage
 - 3. Hemodynamic instability
 - 4. Age \geq 60 years with a major fracture pattern (e.g. open book, vertical sheer)
- ix. Selective embolization is preferred versus non-selective embolization due to a lower complication rate.
- x. If angiography is NOT available, consider the following options:
 - 1. Pre-peritoneal packing; and/or
 - 2. External pelvic fixation; or
 - 3. Early transfer to a comprehensive trauma center with complex Orthopaedic capabilities.

c. DVT prophylaxis

- i. Frequency
 - 1. ~ 34% of patients with a pelvic fracture develop a proximal DVT
 - 2. ~ 12% of those patients go on to develop a PE.

- ii. Initiate DVT prophylaxis quickly with low-molecular weight heparin (LMWH) or low-dose heparin once the hemorrhage is controlled or hemodynamic stability is achieved (< 24 hours).
- iii. SCD to the bilateral lower extremities if there is a contraindication for chemoprophylaxis

III. Pediatrics

- a. Typically, an unusual fracture pattern in children
- b. Obtain cross-sectional (CT scan) imaging with contrast (if other injuries are suspect) of the pelvis to determine fracture pattern and to identify contrast extravasation (bleeding).
- c. Early consultation with Orthopaedic Traumatologist
- d. Placement of sheet for an “open book” type fracture
- e. Type & Cross
- f. Hemodynamic support – consider blood transfusion at 10 mLs/Kg to support BP
- g. Consider ICU admission

IV. References

- a. PHTLS, 6th edition, copyright 2007
- b. EAST Pelvic Fracture Guidelines. JoTIIC 71(6), Dec 2011.
- c. ACS TQIP Orthopaedic Best Practice Guidelines