



CLINICAL PRACTICE GUIDELINE

Pelvic and Acetabular fracture management guidelines

MANAGEMENT IN A&E

Trauma Team management

- ATLS principles
- Haemostatic resuscitation for the haemodynamically unstable patient (PRBC + FFP + Platelets + Ca⁺⁺) + Tranexamic Acid + avoid hypothermia.
- Pelvic binder, if not applied already
- **DO NOT** test for pelvic mechanical stability
- **DO NOT** log roll patient until pelvis is cleared
- All patients suffering high-energy trauma must have examination of the perineum and genitalia plus a rectal examination and the findings recorded in the medical records.

Most haemodynamically unstable pelvic injuries will stabilize with the standard approach of pelvic binder + haemostatic resuscitation. Cases that continue to bleed are expected to be rare.

Trauma CT

- For any blunt trauma patient presenting with **haemodynamic instability** and suspected pelvic fracture, a **Dual phase trauma CT scan** should be requested.
- Otherwise, standard Trauma CT will suffice
- See guidance for management of haemodynamically unstable pelvic fracture.

Pelvic Binders

- All suspected pelvic fractures, or patients with blunt trauma and a systolic blood pressure < 110 mmHg, should have a pelvic binder applied as part of their initial resuscitation; ideally pre-hospital.
You **SHOULD NOT** wait for imaging.
- **Greater Trochanters:** The pelvic binder should be applied centered over the greater trochanters. If a binder is not available then a sheet can be wrapped and tied around the pelvis and the knees/ankles.
- **Children:** In small children where a pelvic binder might be too big, a sheet, towel or large BP cuff can be improvised.
- **No external fixator in A&E:** There is **NO INDICATION** for application of an emergency pelvic external fixator in the Emergency Department.
- **Lateral compression fractures:** binders are relatively **SAFE** to be applied in all pelvic fractures, including lateral compression. This is an emergency haemorrhage control measure, and you won't identify the type of fracture before proper imaging. In addition, the force and displacement caused by the injury is much more than what a binder can do. Most binders have a force limiting mechanism anyway.

Out of Binder Radiographs

All trauma patients who had a trauma CT with a pelvic binder on, and no pelvic fractures identified on the CT, must have a pelvic X-ray after removal of the binder, and before leaving the A&E. (as a pelvic binder can anatomically reduce an open book fracture)

Urinary Catheter & Urological Injuries

- ALL pelvic fractures should have **urinary drainage established before transfer to the orthopaedic ward**. This is by means of a urinary catheter, or supra-pubic catheter when indicated.
- Assess for external signs of urethral injury before attempting catheter insertion (blood at urethral meatus, scrotal/ perineal haematoma, perineal wound).
- A **single, gentle attempt at catheterization, by an experienced doctor**, is permissible, even if the clinical or CT findings suggest urethral injury.
- **In adults, a 16F soft, silicone catheter should be used.**
- The procedure and the presence of clear or blood stained urine must be recorded in the medical records.
- If the catheter drains blood stained urine, a catheter cystogram must be performed.
- If the catheter does not pass, or drains only blood, do **NOT** inflate the balloon, withdraw the catheter and perform a retrograde urethrogram.
- Please refer any urogenital injury to the urology team on call ASAP.

- If a urethral catheter cannot be passed, a suprapubic catheter is required. This can be inserted during emergency laparotomy, if needed, but otherwise a percutaneous suprapubic catheter should be placed.
- A percutaneous, suprapubic catheter should be placed using a Seldinger technique under ultrasound control by a doctor experienced in this technique. The skin insertion point MUST be in the midline and should be 3 to 4 fingers-breadths above the symphysis. A 16F silicone catheter should be used.
- For further details, and for the technique for performing retrograde cystogram or urethrogram, please refer to the trust guidelines on management of urological trauma in pelvic fractures.

Specific injuries

Vertical Shear Pelvic Injury

In addition to the pelvic binder, skeletal traction using a distal femoral traction pin is recommended. Apply skin traction while awaiting application of skeletal traction.

Open Pelvic Fracture – Wounds in the perineum, vagina or rectum require transfer to theatre for debridement and diversion of faeces with a defunctioning colostomy in an upper abdominal quadrant. Basic principles of care of open fractures apply, with antibiotic prophylaxis for infection and pelvic stabilisation by external fixation. Early diagnosis of an open pelvic injury is essential. It is mandatory to involve the on call general surgical, plastic surgery, and/or gynaecologist oncall as soon as the diagnosis is made.

Acetabular fractures

Resuscitation– According to ATLS Protocol.

Imaging:

- Acetabular fractures can present as part of polytrauma (usually diagnosed on Trauma CT) or isolated injury to the hip region.
- If diagnosed on plain film, further imaging with CT is required.
- One should look for signs of hip dislocation, joint incongruity, associated femoral head or neck fracture and neurological injury.

Hip dislocation (native joint) - Should be reduced urgently **in theatre**, under anaesthesia, and placed on skeletal femoral traction if associated with acetabular fracture. Occasionally an anti-rotation boot is also required if the joint is still unstable after application of skeletal traction. It is mandatory to perform a detailed neurological and vascular assessment of the limb(s) before and after reduction of a dislocation.

If the hip is irreducible, remains highly unstable or a new neurological deficit develops after reduction, urgent advice should be sought from one of the pelvic and acetabular surgeons.

INPATIENT MANAGEMENT

Assessment

This should include

- Completion of detailed 2ry survey
- Detailed lower limb neurological assessment.
- Perineal and digital rectal examination, to assess neurology and rule out open pelvic injury. This can be performed in the supine position. You don't need to feel the prostate
- Vaginal exam (by Obs&Gyn) in cases with high suspicion of open pelvic injury.
- Inspection for skin lesions around the pelvis.
- Urological assessment is part of the emergency work up, and a catheter (urethral / supra-pubic) should be inserted before transfer to the ward.

Radiological Investigations

All patients should undergo fine cut CT scans (2-3mm slice thickness) of the whole pelvis.

Pelvic CT reconstructions do not replace Inlet and Outlet views, or Judet views, for the following reasons:

1. The resolution in few occasions can be inadequate and fracture lines can be missed.
2. Plain radiographs are the reference point to intra-operative images.
3. Imaging out of the binder is necessary to rule out injuries masked/reduced by the binder, and assess extent of displacement.

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| Pelvic fracture | AP + Inlet and Outlet views of whole pelvis |
| Acetabular fracture | AP pelvis + Judet oblique views of whole pelvis |
| Spinal Series | Thoracolumbar AP and lat views, or CT scanning of the entire spine, is recommended in all cases of displaced pelvic injuries and acetabular fractures. |

A combined pelvic and acetabular fracture will require AP pelvis radiograph plus inlet/ outlet views and Judet oblique views of the whole pelvis.

Inpatient care

This should include:

- Adequate analgesia, but **no NSAIDs**
- Skeletal traction where appropriate: see below
- VTE prophylaxis: start Enoxiparin 40 mg o.d. within 24 hours of admission unless there is a contraindication, see *below*. Always check with other teams involved (e.g. General Surgery if concomitant abdominal injury, neurosurgery if concomitant head injury....etc) before starting VTE prophx
- Start **bowel management** to prevent constipation ASAP. Senna + Movical
- Omeprazole or Lansoprazole PO

VTE Prophylaxis

- Start within 24 hours of injury or restoration of haemodynamic stability
- 40mg Enoxiparin OD, unless contraindicated.
- If chemical prophylaxis is contraindicated, use intermittent calf compression, if there is no contraindication (e.g. leg injury)
- Contraindications to LMWH:
 - Persistent haemodynamic instability
 - Head injury with acute intracranial haemorrhage
 - Spinal injury with unstable vertebral injury requiring stabilization (check with spinal team)
 - Active peptic ulcer or recent GI haemorrhage
 - Other sources of active bleeding
 - Allergy to heparin
- With other acute injuries that have potential for major haemorrhage (e.g. splenic rupture, aortic dissection), check with the appropriate specialty before commencing LMWH.
- In patients with delayed surgery more than 3 days, perform Duplex Ultrasound scan to rule out DVT pre-operatively. If there is a DVT, arrange for insertion of IVC filter pre-operatively. This should be removed at 4-6 weeks postoperatively.

Skeletal Traction

- This is indicated in displaced acetabular fractures and vertical shear pelvic fractures.
- To be applied in the **distal femur**, unless there is associated femur fracture.
- Total skeletal traction weight is 10% of body weight
- Apply skin traction while awaiting application of skeletal traction.

Pre-operative work up

Work up should include the following:

- Up to date FBC, U&E, clotting profile
- Cross match 4 units PRBC
- Appropriate radiographs (see above)
- Documented neurological and urological assessment.
- Prophylactic antibiotics at induction: Ceftriaxone + Teicoplanin.

Referral to pelvic team & shared care

- This is recommended as soon as possible, even out of hours
- A succinct form outlining the pertinent information required before referring a pelvic fracture is attached. **This form should be filled by the registrar / SHO of the referring team, and placed at the front of the notes.**

As the referring trauma team has dedicated time to look after the acute aspects of the injuries, the patient remains under a joined care between the admitting team, and the pelvic team. The admitting team will look after the associated injuries and liaise with other related specialties (e.g. spine, general surgery...etc). For patient convenience, the pelvic team may offer to take over the outpatient care of other injuries from 6wks point if there were no active issues regarding fractures or soft tissues and wounds. However, the pelvic team may need to refer those back to the treating surgeons if concerns/complications requiring special attention/surgery arise.

Post-operative care plan

Unless specified in the post op note, the plan will include:

- Start VTE prophylaxis the next morning, unless contra-indicated
- No NSAIDS
- Continue bowel management to prevent constipation ASAP. Senna + Movical
- Omperezole or Lansoprazole PO
- Clinic follow up will be 6, 12, 26, 52 wks with related X-rays on arrival.
- Check x-rays +/- CT as specified in the post op notes.
- Routine postoperative bloods: FBC, U&Es + Group and Save next morning.

**REFERRAL / ASSESSMENT FORM
PELVIC AND ACETABULAR FRACTURES**

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| Name of patient /label | |
| Date of birth | |
| Date of injury | |
| Mechanism of injury | |
| Neurovascular injury/complications | YES / NO if YES, please give details: |
| Urethral injuries Perineal injuries Rectal/vaginal injuries | YES / NO if YES, please give details: |
| Catheter in situ | YES / NO |
| Associated/ other injuries | |
| Treatment given so far | |
| Relevant imaging (pls circle) | Radiographs CT MRI |
| Referring consultant | |