

Trauma Service Guidelines

Title: Emergency Trauma Urethrogram
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Introduction

Trauma patients with pelvic fractures have experienced considerable force and may need to be evaluated for urethral and/or bladder rupture.

Background

- The mean incidence of urethral injury in pelvic fractures is approximately 4-19% in males and 0% - 6% in females¹⁻⁸
- Injury to the male posterior urethra is associated with disruption of the anterior arch of the pelvis, specifically pubic symphysis diastasis and displaced inferomedial pubic bone fractures⁹ (**see Appendix 1**)
- Anteroposterior compression injuries tend to produce more frequent injury to the lower urinary tract than lateral forces.¹⁰

Emergency Trauma Urethrograms (ETU) Indications

ETU is the gold standard for evaluating urethral injury.^{6,11} An ETU should be performed in a **male trauma patient** in the following instances: (**see Appendix 2**)

- Clinical signs of urethral rupture
 - ◆ Meatal blood, perineal swelling/haematoma, boggy or high riding prostate, pain on urination or inability to void¹²
 - ◆ These signs may be absent in approximately 40% of patients particularly when seen within the first hour after injury^{5,11,13}
- In the setting of pelvic fractures involving movement of the pubic rami in relation to the rest of the pelvis.
 - ◆ Straddle fractures (with or without sacroiliac joint diastasis)
 - ◆ Malgaigne fractures (ipsilateral rami fractures with ipsilateral sacroiliac joint diastasis)
- It is known that plain pelvic X-rays can miss between 9-22% of fractures and that assessment of the integrity of the posterior arch is difficult on a single film¹⁴ therefore an ETU should be performed if clinical and/or radiological signs suggest urethral injury^{11,13,15}
- If there is any doubt as to the presence of a pelvic fracture then management as per a suspected urethral injury is recommended.

Female Urethral Injuries

Female urethral injuries occur by contusion or laceration of the urethra by bone fragments and are less likely to be complete.^{4,16} Approximately 80% are associated with vaginal lacerations or blood at the introitus.^{4,17} Investigation is controversial and should be performed after consultation with Urology with a view to examination including urethroscopy under anaesthesia.

Bladder Rupture

Bladder rupture by bony spicules or because of lap belt pressure should be investigated in the ED with CT cystography.^{18,20}

Clinical and radiological signs of bladder rupture include macroscopic haematuria, lower abdominal tenderness, pelvic fractures and pelvic fluid on standard CT.^{13,19}

Urografin will be administered by the Radiology or ED registrar/consultant; drainage films may need to be performed at a later date as advised by Urology to increase sensitivity of the cystography for bladder rupture.

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Equipment for Retrograde Urethrogram

- Foley catheter (usually size 14-16)
- Water for balloon
- Urografin 70% boluses of 10 - 20ml (Up to 3 may be required)
- IDUC dressing pack

Procedure

- The ETU is performed on a trauma trolley in the trauma resuscitation area; the urografin 30% is available in the ED radiology storeroom opposite ED CT scanner.
- The Emergency consultant, Radiology and/or Urology registrar can perform the procedure
- The investigator must wear a lead gown
- Xray plate positioned as for pelvic views
- Xray beam angled in the 30° oblique position
 - Clean and drape area
 - Insert IDUC into navicular fossa – this will be no more than 1 cm proximal to the meatus.
 - Instil water into balloon to achieve a seal within the urethra (approx ≤ 3 ml but up to 5ml may be needed).
 - Position the penis to the side to allow lateral view of the urethra, with traction applied so that the bulbous urethra can be imaged along its length.
 - Firmly grasp the penis and extend laterally in an oblique direction as 10-20 ml Urografin is injected (this will help prevent the chances of the IDC slipping out of the navicular fossa.)
 - Film is taken towards the end of Urografin injection
- Injection may be repeated 3 times if necessary.

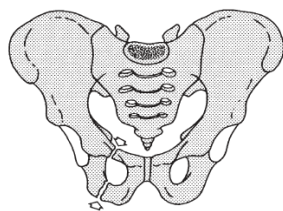
Follow Up

- Inform the Urology registrar of the results of the procedure.
- Incomplete/complete rupture with mild distraction requires a suprapubic catheter performed under ultrasound control by the Radiology registrar^{11,20,21}, or in theatre +/- exploration and realignment if other injuries indicate operative management.
- Complete rupture with wide distraction requires a suprapubic catheter followed by primary alignment.^{20,21}

RISK OF URETHRAL INJURY WITH PELVIC FRACTURE

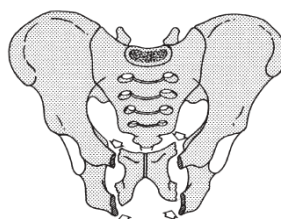
Type of fracture	Odds ratio
Single ramus	0.6
Ipsilateral rami	0.8
Malgaigne's (vertical shear)	3.4
Straddle	3.9
Straddle plus sacroiliac	24.0

Ipsilateral fractures of the pubic rami.



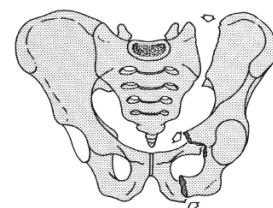
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Straddle fracture.



F

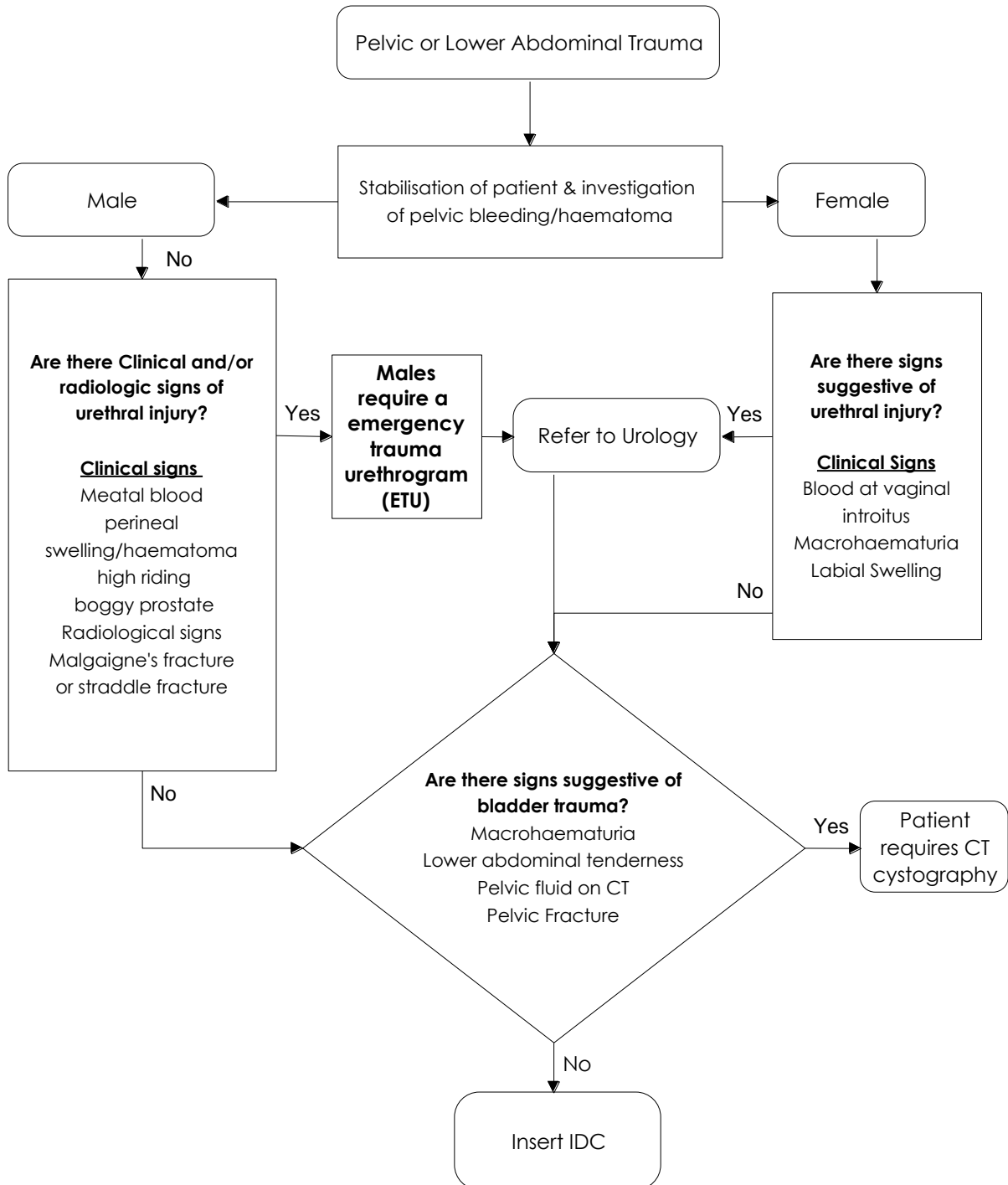
Malgaigne fracture



H

Resnick: Internal Derangements of Joints, 2nd ed. Saunders, Pg. 1445

EMERGENCY TRAUMA URETHROGRAMS



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