



EM CASES SUMMARY

Episode 143 Priapism & Urinary Retention: Nuances in Management

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Priapism: The Ischemic Fifth Limb

Priapism is defined as an unwanted prolonged erection. Similar to acute brain and heart ischemia, **time is tissue** for ischemic priapism. Initiate treatment as soon as possible, preferably within 4-6 hours to minimize the risk of impotence that occurs in 100% of patients with untreated ischemic priapism at 48 hours.

Low flow vs. High flow Priapism

Low flow priapism is ischemic and a true urologic emergency – a compartment syndrome of the penis, whereas high flow is non-ischemic. Low flow is far more common, with high flow only making up about 2% of presentations.

Priapism is a clinical diagnosis. On exam, key findings include an erect corpus cavernosa with a flaccid glans. There are a number of ways to differentiate ischemic and non-ischemic priapism based on history and lab findings.

<i>Low flow</i>	<i>High flow</i>
Ischemic	Non-ischemic
Venous obstruction	Increased arterial inflow
Severe pain	Less symptomatic
Often medication-induced or related to sickle cell disease	Caused by trauma (eg, straddle injury)
Acidotic penile blood gas	Normal penile blood gas

A variety of **medications and toxins** can cause ischemic priapism, including:

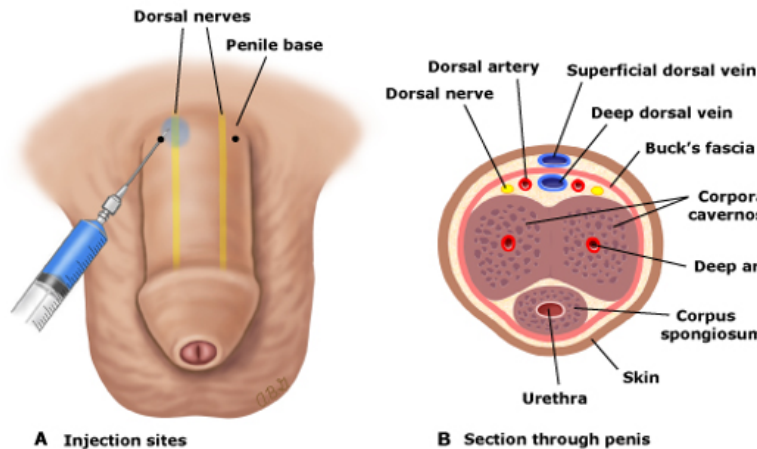
- Intra-cavernosal injections (“*triple mix*” – papaverine, prostaglandin E1 and phentolamine)
- PDE5 inhibitors (sildenafil, tadalafil)
- Anti-hypertensives (hydralazine, prazosin, calcium channel blockers)
- Neuroleptics (trazodone, chlorpromazine)
- Drugs of abuse: cocaine, marijuana

Get a **baseline penile blood gas** with the first aspiration of intra-cavernosal blood. Although it may not aid in the diagnosis, serial gases may be useful to monitor response to treatment. An ischemic blood gas will be dark, hypoxemic ($pO_2 < 30-40$), acidotic ($pH < 7.25$, $pCO_2 > 60$) and glucopenic.

Management of priapism: stepwise approach

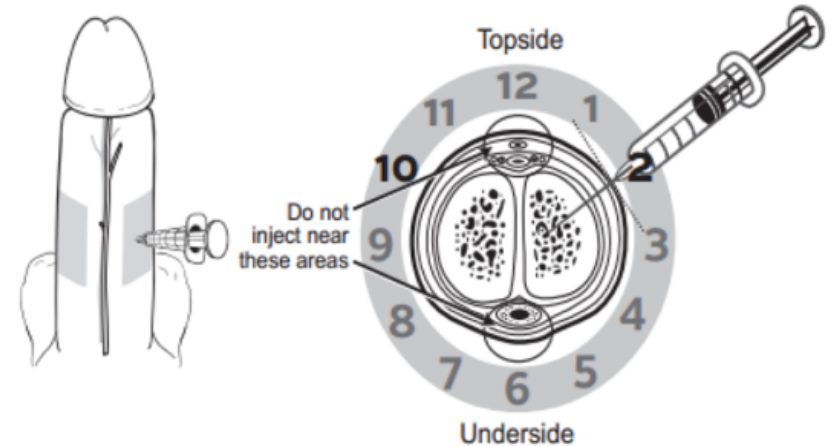
1. **Dorsal nerve block:** retract the penis caudally and insert a small gauge (25-27G) needle on either side of the midline at 10 and 2 o'clock, inject lidocaine (without epinephrine); you should feel a pop when you pass through Buck's fascia to

know you're in the correct space



2. **Corporal aspiration (getting blood out of the penis):** insert a 19G butterfly needle into the lateral corpora at the 10 and 2 o'clock positions; aspirate **10-20 mL** of blood (while the patient is squeezing the penis proximally) and send a blood gas; avoid the urethra (ventrally) and neurovascular bundle (dorsally); this can be repeated on the other side if priapism persists; a patient's response to this treatment largely depends on how long they have had an

erection



3. **Corporal irrigation:** if detumescence does not occur after 2 aspiration attempts of 20-25 mL each, irrigate the corpus cavernosa with 25 mL of cold (10°C) sterile saline; aspirate the fluid back after a period of 20 minutes if priapism persists
4. **Phenylephrine injection** squeezes the blood out of the penis and back into the body; ask the patient to squeeze the penis distally to help facilitate this, dilute to 100 mcg/mL and inject 1-2 mL q5min, to a **maximum dose = 1 mg over 1 hour**.
5. **Consult urology** for consideration of surgical management

Clinical Pearl: for aspiration of the corpora, ask the patient to squeeze their penis proximally to get the blood out of the body; for phenylephrine or cold saline injections ask the patient to squeeze their penis distally to get the blood from the penis into their body.

Other ischemic priapism management options

- **Terbutaline** 5-10 mg orally has some supporting evidence
- **Exercise** – ask them to do squats or walk up and down a few flights of stairs; there are case reports claiming effectiveness

Urinary Retention

While the diagnosis of urinary retention is usually straight forward, an important first step or cognitive forcing strategy is to consider **the life- or limb-threatening etiologies** such as cauda equina syndrome/spinal cord compression.

Causes of urinary retention

The 4 main categories that can cause urinary retention are obstructive, infectious/inflammatory, neurologic, and medications.

Category	Common causes of urinary retention
Obstructive	Benign prostatic hyperplasia, prostate cancer, gynecological mass, bladder stones, fecal impaction, vaginal prolapse
Infectious/Inflammation	Urinary tract infection, prostatic abscess, acute vulvovaginitis
Neurologic	Cauda equina syndrome, cord compression, transverse myelitis, spinal cord trauma, multiple sclerosis
Medications	Tricyclic antidepressants, antipsychotics (ex. Haldol), opioids, diphenhydramine, ephedrine, NSAIDs, drugs with anticholinergic activity

Clinical Pearl: While obstructive pathology such as an enlarged prostate may be a common etiology of urinary retention, a **neurologic cause** such as cauda equina syndrome or cord compression (for example, secondary to a metastatic spinal mass from prostate cancer) should be considered and ruled out when assessing patients for retention.

Indications for a urethral catheter for patients in urinary retention

The most common indication for insertion of a urethral catheter is in the patient who is unable urinate (or is dribbling urine) for 10-12 hours with significant lower abdominal discomfort and bladder distension. Other indications for urethral catheter insertion include acute kidney injury (elevated creatinine or hydronephrosis) secondary to an obstruction, a patient with a suspected urinary tract infection who is unable to void, or evidence of overflow incontinence.

A post-void residual bladder scan may be helpful in confirming urinary retention. There is variation in defining urinary retention according to post-void residual urine volume ranging from 100-300 mL. However, volumes <100 mL are generally considered a rule out while volumes >300 mL are generally considered a rule in.

Approach to difficult urinary catheter insertion: Key steps

Analgesia: consider a short acting systemic analgesic such as fentanyl. Apply **ample** amounts of **lubricant with lidocaine** (e.g. 2 uro-jets). It is important that the patient is as relaxed as possible so that **the pelvic muscles become relaxed**.

Clinical Pitfall: injecting the lubricant with lidocaine into the meatus too quickly can be painful and may cause the patient to tighten/tense the pelvic

muscles thus preventing passing of the urethral catheter into the bladder. Intraurethral injection must be done **slowly**.

Choice of urethral catheter: the most common catheter used in the setting of a difficult urethral catheter insertion is a 16-F Coude catheter.

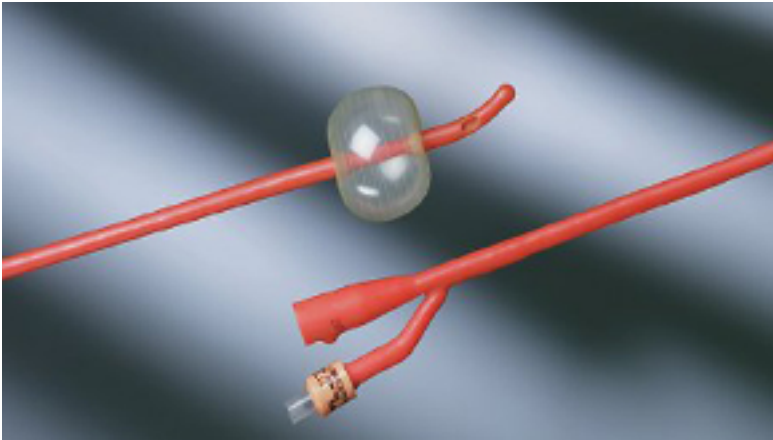


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Clinical Pearl: if the cause of retention is not a stricture, but rather an enlarged prostate, the size of the catheter **should be increased** from 16-F to 18-F if the insertion of the 16-F was unsuccessful. A thicker catheter is less likely to find the many crevices present in an enlarged prostate. In contrast, if the cause of the retention is a stricture, a smaller catheter size should be chosen.

Technique: the penis should be held perpendicular to the patient (the meatus should be facing the ceiling with the patient supine). Inject ample amounts of lubricant with lidocaine slowly and gently pinch the meatus after injection to prevent the lubricant from leaking back outside of the penis.

Clinical Pearl: if the patient has a history of radical prostatectomy and if the Coude catheter is not passing, think bladder neck obstruction and consult urology.

Indications for suprapubic catheter

Suprapubic catheters are considered after unsuccessful attempts with urethral catheters usually in the setting of severe urethral strictures or complex prostatic disease. Another indication for suprapubic catheter is urethral disruption due to trauma. While indwelling urethral foley catheters remain the initial approach to urinary retention, suprapubic catheters have been shown to be more comfortable, associated with less bacteriuria and less re-catheterization rates compared to indwelling urethral catheters.

Contraindications to placing a suprapubic catheter include empty or unidentifiable bladder and bowel anterior to the bladder wall.

Suprapubic catheter key procedural steps

- Gear required includes peel-away introducer sheath (can use central line kit using the Seldinger technique if not available), ultrasound, sterile gloves, chlorhexidine, lidocaine, sterile syringe, spinal needle (22 gauge for adults), scalpel, foley catheter, dressing
- Ultrasound to identify and landmark the bladder (usually 1-2 cm above pubis symphysis)
- Prep skin and local anaesthetic
- Using real-time ultrasound guidance, advance needle to bladder
- Placement is confirmed when urine is withdrawn into syringe (can also confirm on ultrasound)
- As a temporizing measure (when, for example there is poor access to a urologist and you have little/no experience advancing a wire into the bladder), much of the urine can be withdrawn at this step to relieve the bladder distention and the procedure terminated until help arrives
- Advance guidewire into bladder
- Use scalpel to extend skin incision to allow for dilator

- Pass peel-away sheath and dilator over guidewire
- Insert foley catheter through sheath and into bladder
- Aspirate urine to confirm foley placement and inflate foley balloon
- Remove peel-away sheath and dress site

Post-obstructive diuresis: when to worry

Post-obstructive diuresis is defined as urinary output > 200 mL for at least 2 hours after urethral catheter insertion, or > 3L in 24hrs. This is after the initial volume of urine has come out.

Patients who are at high risk of complications as a result of post-obstructive diuresis include patients with abnormal electrolytes or newly elevated creatinine, volume overload, uremic, or confused. These patients should be observed for at least 4 hours following urethral catheter insertion and if urinary output is > 200ml/hr, they should be admitted with a consult to internal medicine.

Low risk patients (normal electrolytes/creatinine, euvolemic, clinically well) usually do not require observation after the urethral catheter is inserted and distended bladder is relieved.

Duration of indwelling urethral catheter

Our experts recommend that urethral indwelling catheters remain in the bladder for a duration of 7-10 days. If the catheter is removed too early (ie. in 2-3 days), the likelihood of requiring re-catheterization (with potential complications of repeated catheterization) has shown to be high. Antibiotic prophylaxis is *not* recommended unless there is an underlying infection present. In patients with benign prostatic hypertrophy as a cause of retention, **an alpha-blocker** such as **tamsulosin 0.4mg daily** has been shown to decrease the likelihood of re-catheterization after a trial of void. Exercise caution in prescribing alpha-blockers in patients with Parkinson's disease and/or orthostatic hypotension. All patients should be educated regarding orthostatic hypotension when prescribing alpha blockers.

Common clinical pitfall: a common pitfall is to remove the urethral catheter after 2-3 days when patients request to do so; the evidence is clear that the likelihood of re-catheterization and it's associated traumatic complications are higher compared to removal after 7 days.

Take Home Points for priapism and urinary retention

- Priapism: time is tissue; treatment should be started by the emergency physician, not the urologist
- Assume ischemic priapism until proven otherwise
- In urinary retention, important to consider and rule out the dangerous neurologic causes including cauda equina syndrome
- Use lots of lubricant with lidocaine for urethral catheter insertion and inject slowly
- In the setting of enlarged prostate, if a 16-F Coude catheter insertion is unsuccessful, then *increase* the size of the catheter
- Patients with high risk of post-obstructive diuresis and it's complications should be observed in the ED for at least 4 hours
- The urethral catheter should remain in-situ for at least 1 week and an alpha-blocker should be considered to decrease the likelihood of re-catheterization after a trial of void

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Priapism

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Urinary Retention

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