Acute urinary retention

See also the separate Chronic Urinary Retention, Catheterising Bladders and Benign Prostatic Hyperplasia articles.

What is acute urinary retention?

Acute urinary retention (AUR) is the sudden inability to pass urine. It is usually painful and requires emergency treatment with a urinary catheter.

What causes urinary retention? (Aetiology)

Causes of urinary retention are numerous and can be classified as [1] :

- In men - benign prostatic hyperplasia (BPH), meatal stenosis, paraphimosis, penile constricting bands, phimosis, prostate cancer.
- In women - prolapse (cystocele, rectocele, uterine), pelvic mass (gynaecological malignancy, uterine fibroid, ovarian cyst), retroverted gravid uterus.
- In both - bladder calculi, bladder cancer, faecal impaction, gastrointestinal or retroperitoneal malignancy, urethral strictures, foreign bodies, stones.

Infectious and inflammatory

- In men - balanitis, prostatitis and prostatic abscess.
- In women - acute vulvovaginitis, vaginal lichen planus and lichen sclerosis, vaginal pemphigus.
- In both - bilharzia, cystitis, herpes simplex virus (particularly primary infection), peri-urethral abscess, varicella-zoster virus.

Drug-related urinary retention

Up to 10% of acute urinary retention episodes are thought to be attributable to drugs. Those known to increase risk include:

- Anticholinergics (eg, antipsychotic drugs, antidepressant agents, anticholinergic respiratory agents).
- Opioids and anaesthetics.
- Alpha-adrenoceptor agonists.
- Benzodiazepines.
- Non-steroidal anti-inflammatory drugs.
- Detrusor relaxants.
- Calcium-channel blockers.
- Antihistamines.
- Alcohol.

Neurological

More often causing chronic retention but may cause acute urinary retention:

- Autonomic or peripheral nerve (eg, autonomic neuropathy, diabetes mellitus, Guillain-Barré syndrome, pernicious anaemia, poliomyelitis, radical pelvic surgery, spinal cord trauma, tabes dorsalis).
- Brain (eg, cardiovascular disease (CVD), multiple sclerosis (MS), neoplasm, normal pressure hydrocephalus, Parkinson's disease).
- Spinal cord (eg, invertebral disc disease, meningomyelocele, MS, spina bifida occulta, spinal cord haematoma or abscess, spinal cord trauma, spinal stenosis, spinovascular disease, transverse myelitis, tumours, cauda equina).

Other

- In men - penile trauma, fracture or laceration.
- In women - postpartum complications (increased risk with instrumental delivery, prolonged labour and caesarean section)[2] ; urethral sphincter dysfunction (Fowler's syndrome).
- In both - pelvic trauma, iatrogenic, psychogenic.

BPH is by far the most common cause of urinary retention.

Acute urinary retention is often encountered postoperatively and the reasons for this are multifactorial:

- Pain.
- Traumatic instrumentation.
- Bladder overdistension.
- Drugs (particularly opioids).
- Iatrogenic - for example:
  - Suburethral sling procedures for stress incontinence[3] .
  - Posterior colporrhaphy[4] .
- Decreased mobility and increased bed rest.

Who gets acute urinary retention? (Epidemiology)

Studies suggest that over five years, 10% of men over age 70 and close to one third in their 80s will develop acute urinary retention[5] . It is ten times more common in men than in women and highest in men aged over 70[6] .

Urinary retention symptoms[6]

Usually the diagnosis is self-evident. The patient is very uncomfortable and unable to pass urine, with a tender, distended bladder. However, it is necessary to consider the diagnosis in those unable to describe symptoms - eg, unconscious patients following trauma. History and examination should be directed towards determining a cause for the acute urinary retention. Whilst BPH is very common, rarer but serious causes such as cauda equina or cord compression must not be missed.

See also the separate Genitourinary History and Examination (Male) and Genitourinary History and Examination (Female) articles.

History

- Nature and duration of current symptoms - eg, anuria, pain.

- Any other associated symptoms - eg, fever, weight loss, sensory loss, weakness.
- Enquire regarding previous episodes of retention and history of lower urinary tract symptoms (LUTS).
- Consider precipitants - eg, alcohol consumption, recent surgery, urinary tract infection (UTI), constipation, large fluid intake, cold exposure or prolonged travel.
- Past medical history - eg, neurological conditions.
- Check medication (both prescribed and over-the-counter) for agents known to cause urinary retention.

Examination

- General - look for fever and signs of infection and systemic illness.
- Abdominal - a tender enlarged bladder with dullness to percussion well above the symphysis pubis, often almost to the level of the umbilicus.
- Genitourinary:
    - In men, look for phimosis or meatal stenosis, as well as urethral discharge and genital vesicles.
    - In women, look for evidence of:
        - Vulval or vaginal inflammation or infection.
        - Cystocele, rectocele or uterine prolapse.
        - Pelvic mass (eg, retroverted gravid uterus, uterine fibroid, gynaecological malignancy).
- Per rectum (PR) - check anal tone, prostatic size, nodules, tenderness, etc and exclude faecal impaction[6] .
- Neurological - look for evidence of prolapsed disc or cord compression by checking lower limb power and reflexes as well as perineal sensation.

Differential diagnosis

Distinguish from chronic urinary retention:

- Acute urinary retention is usually painful, whilst slowly obstructing pathological processes tend to be relatively pain-free.
- Prostatic hyperplasia may be associated with obstruction uropathy that is relatively painless but frequently comes to light when a superimposed acute obstruction occurs preventing effective urination ('acute-on-chronic' urinary retention). For about 50% of those with AUR, the acute retention was their first symptom of underlying prostatic hyperplasia[7] .

Investigations[1]

- Urinalysis - check for infection, haematuria, proteinuria, glucosuria.
- MSU.
- Blood tests:
    - FBC.
    - U&E, creatinine, estimated glomerular filtration rate (eGFR).
    - Blood glucose.
    - Prostate-specific antigen (PSA). **NB**: this is elevated in the setting of AUR so is of limited use at this stage[6] .

- Imaging studies:

    - Ultrasound - commonly used, as it can provide a measure of post-void residual urine as well as looking for hydronephrosis and other structural abnormalities of the renal system.
    - CT scan - used to look for pelvic, abdominal or retroperitoneal mass causing extrinsic bladder neck compression.
    - MRI/CT brain scan - used to look for intracranial lesions (eg, tumour, stroke, MS).
    - MRI scan of the spine - used to look for disc prolapse, cauda equina syndrome, spinal tumours, spinal cord compression, MS.
    - Investigations such as cystoscopy, retrograde cystourethrography or urodynamic studies may also be undertaken depending on the suspected cause of retention.

Urinary retention treatment and management[6]

Initial management

- Immediate and complete bladder decompression. The National Institute for Health and Care Excellence (NICE) recommends that men with acute urinary retention should be immediately catheterised. An alpha-blocker should be offered before removal of the catheter[8] .
- Pharmacological treatment for postoperative retention (eg, cholinergics, intravesicle prostaglandin) was explored in a Cochrane review in 2010 as an alternative to catheterisation[9] . It concluded that further studies were required but there has been no subsequent convincing evidence in the scientific literature that this approach is likely to be effective.

Secondary management

This is dependent on the cause of the acute urinary retention. For AUR caused by prostatic enlargement:

- Until recently, this consisted almost exclusively of prostatic surgery within a few days (emergency surgery) or a few weeks (elective surgery) of a first AUR episode. It is known, however, that there is greater morbidity and mortality associated with emergency surgery and that morbidity increases with prolonged catheterisation.
- Trial without catheter (TWOC) has become a standard practice worldwide for men with BPH and AUR. In most cases, an alpha-blocker is prescribed before commencing TWOC and significantly increases the chance of success. Prolonged catheterisation is associated with an increased morbidity [10] .

Complications [11]

- UTIs.
- Acute kidney injury.
- Post-obstructive diuresis (marked natriuresis and diuresis with electrolyte disturbance, including hypokalaemia, hyponatraemia, hypernatraemia and hypomagnesaemia).
- Post-retention haematuria - 2-16% in one study after rapid decompression via a catheter and usually self-limiting [12] .

Prognosis

There is an increased mortality rate associated with acute urinary retention [13] :

- In one study of 100,067 men with spontaneous AUR, the one-year mortality was 4.1% in men aged 45-54 years and 32.8% in those aged 85 years and over.
- In men aged 75-84 years with spontaneous AUR - the most prevalent age group - the one-year mortality was 12.5% in men without comorbidity and 28.8% in men with comorbidity.
- The mortality rate associated with AUR increases strongly with age and comorbidity. There is a high prevalence of comorbidities, such as CVD, diabetes and chronic pulmonary disease, in those with urinary retention.

- The use of less invasive methods to treat underlying causes (eg, prostatic stents) may help to improve the prognosis of men with comorbidities.

Postoperative urinary retention is usually transitory but can be prolonged in some cases. It may lead to UTI, long-term bladder dysfunction and chronic kidney disease [9] .

Acute urinary retention prevention

Prevention of acute urinary retention in men with BPH may be achieved by long-term medical treatment (5-alpha reductase inhibitors alone or in combination with alpha-blockers) [14] .

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