RATIONAL TESTING

Investigating chronic urinary retention

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What you need to know

- Patients with chronic retention are usually still voiding urine and it is not usually painful. Physical examination may reveal a painlessly distended urinary bladder.
- Urine dipstick, blood tests for renal biochemistry, and ultrasound scanning can help differentiate low pressure chronic retention (LPCR) from the more serious but less common high pressure urinary retention (HPCR).
- Immediately refer patients with impaired renal function to secondary care for further management.

A 68 year old man complains of worsening fatigue, nausea, and loss of appetite. He reports minimal urinary symptoms but has described episodes of night time bed-wetting in recent months. On examination, he looks generally unwell. He has no abdominal pain. His lower abdomen is dull to percussion up to the level of the umbilicus. He is still voiding urine. Urgent blood investigations are arranged by the general practitioner, which reveal an acute kidney injury.

Chronic urinary retention is a common presentation in men in primary care. Women are less commonly affected. The condition is frequently not recognised, as symptoms often progress slowly and are not serious. Patients with acute urinary retention are not voiding urine and are in pain. In contrast, patients with chronic retention void without pain. Chronic urinary retention has two subtypes: low pressure chronic retention (LPCR) and the more serious, but less common, high pressure chronic retention (HPCR). The terms “high” and “low” refer to the bladder pressure at the end of voiding, but pragmatically, HPCR refers to patients with abnormal renal function and/or hydronephrosis, and people with LPCR have normal kidney function and normal kidneys. Acute-on-chronic retention occurs when a patient with chronic retention stops voiding completely.

How should I assess the patient?

Patients with chronic urinary retention often do not report any abdominal pain or urinary symptoms, even when they present with acute kidney injury. It is not unusual for chronic urinary retention to be identified incidentally as a very large residual volume during radiological investigations for other symptoms. This is common in LPCR. A minority of patients present with serious acute kidney injury, which is a surgical emergency requiring immediate urological referral.

Box 1 provides an overview of initial assessment of the patient. Nocturnal enuresis, if present, is the only urological symptom that strongly suggests HPCR rather than LPCR, other than symptoms or signs suggestive of acute kidney injury. Box 2 lists the anticholinergic medications and other categories of drugs with anticholinergic burden, which could exacerbate chronic retention.
Kidney injury and typically have abnormal renal biochemistry. Patients with HPCR develop symptoms and signs of acute urinary retention, as kidney injury, the insertion of a urinary catheter, and retention itself can all produce a spurious elevated result.

**Utrasound**

If available in primary care, a simple post-void bladder scan can quantify the residual bladder volume. This can be variable with residual volumes of 300 mL to >3 L being measured. In a fit patient with no symptoms and who is clinically well, a routine bladder scan in a few weeks would be reasonable. In an unwell patient with normal renal function, request an urgent ultrasound. Patients with urinary retention and abnormal renal function on blood tests should be referred to a specialist as a same day surgical emergency.

A renal tract ultrasound is recommended in all patients with chronic urinary retention. It is a simple intervention that differentiates between HPCR and LPCR. Request this urgently in men with new onset abnormal renal function. Men with HPCR often have evidence of unilateral or bilateral hydronephrosis, a distended urinary bladder, and excessive post-micturition residual volumes. Men with LPCR may have a distended bladder and large residual volume but they do not have hydronephrosis.

**Specialist investigations**

Urodynamc pressure flow studies may be performed in secondary care to help predict the outcome after prostatic surgery, but do not influence the early management of chronic retention. Cross sectional imaging such as computed tomography (CT) scanning is not normally indicated, but can sometimes be helpful in the differential diagnosis of bilateral hydronephrosis.

**How is it managed?**

Box 3 lists criteria to guide referral of patients for further specialist management.

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**Box 1: What to cover on history and examination**

**Lower urinary tract symptoms**
- Voiding symptoms—hesitancy, straining, poor or/and intermittent stream
- Storage symptoms—frequency, nocturia, urgency +/- urgency incontinence
- Nocturnal enuresis (night time bed wetting)

**Relevant medical history**
- Urinary tract infections, haematuria, urinary tract stones (urolithiasis)
- Previous instrumentation of urinary tract—cathester or prostate surgery
- Comorbid medical conditions
- Constipation

**Drug history**
- Relevant urological medications—alpha blocker/5-alpha reductase/anticholinergics
- Medications with anticholinergic or sympathomimetic properties (Box 3)
- Antiaggregants/antiplatelets
- Drugs affecting renal function

**General and abdominal examination**
- Signs of peripheral oedema, uraemia, hypertension, cardiac failure
- Palpable or percussable bladder
- External genitalia and digital rectal examination

**Box 2: Anticholinergic drugs and other drugs with an anticholinergic burden that can cause urinary retention**
- Danafenacin (Enablex)
- Fesoterodine (Toviaz)
- Flavoxate (Urispas)
- Oxybutynin (Ditropan, Ditropan XL)
- Solifenacin (Vesicare)
- Darifenacin (Enablex)
- Trospium (Sanctura, Sanctura XR)

**Drugs with anticholinergic properties**
- Antidepressants, antihistamines, antiparkinsonian drugs, antispasmodic/muscle relaxant drugs, antipsychotics, bronchodilators, analgesics (codeine, fentanyl, morphine)

Identifying a distended urinary bladder during physical examination will determine the next step in the management process. Palpation of the bladder can be difficult, particularly in larger patients. Percussion of the bladder can be more reliable because of the clear contrast between the resonant upper abdomen due to bowel gas and the dull lower abdomen due to the fluid in the distended bladder.

In patients with voiding difficulties, examine the penis for a phimosis of the foreskin and the urethral meatus for stenosis. A rectal examination is recommended to assess the consistency of the prostate and possible risk of prostate cancer.

**What is the next investigation?**

**Basic tests**

**Urine dipstick**

Proteinuria and non-visible haematuria may indicate signs of acute kidney injury suggesting HPCR. The presence of leucocytes and nitrates may indicate concurrent urine infection.

**Blood investigations**

Patients with HPCR develop symptoms and signs of acute kidney injury and typically have abnormal renal biochemistry...
Low pressure chronic retention

A conservative watch and wait approach, with symptomatic management in primary care, may be considered if the patient has mild urinary symptoms in the context of normal renal function. Catheterisation can be avoided in asymptomatic patients with a high post-micturition residual volume with normal renal function and no hydronephrosis, but should be kept under observation if their residual volume is more than about 500 mL. Discuss treatment options with the patient to understand their preferences and tailor the management approach. Consider discontinuing medications that may be causing retention.

Outpatient follow-up and repeat assessment of post-void residual volume is appropriate in patients with LPCR 4 Alpha blockers with or without 5α-reductase inhibitors may improve the urological symptoms. Clean intermittent self-catheterisation is a good technique for managing lower urinary tract symptoms and recurrent urinary tract infection. 5 Bladder outlet surgery (eg, transurethral resection of the prostate, which is appropriate for patients with LPCR if they have bothersome lower urinary tract symptoms) cannot always restore normal bladder compliance and contractility in men with LPCR. Preoperative clean intermittent self-catheterisation may improve surgical outcomes. 6

High pressure chronic retention

Immediate referral to secondary care and early catheterisation in a specialist unit is recommended for patients with suspected HPCR if they have evidence of renal dysfunction and/or hydronephrosis on ultrasound. Patients may develop haematuria following bladder decompression. Patients may pass many litres of urine in the days following catheterisation, but there is no evidence to support the historical technique of catheter clamping and slow decompression. 7 Close monitoring for post obstructive diuresis is done by assessing weight, fluid input/output, lying and standing blood pressure, and urea and electrolyte levels daily until normalised. Intravenous fluids are not usually required, except in few patients who develop pathological diuresis.

HPCR patients should not undergo a trial without catheter before a definitive intervention (such as surgery) has been performed. Most patients notice excellent outcomes from bladder outlet surgery, because most maintain contractile function. 8 Preoperative urological drug therapy is not necessary. Rarely, a long term catheter may be indicated in a patient with HPCR who is unfit for surgery.

Outcome

Blood investigations showed a creatinine of 660 μmol/L and an estimated glomerular filtration rate 18 mL/min. The patient’s general practitioner contacted the on-call urology team directly at his local hospital to arrange an urgent admission. At the hospital, he was catheterised and 1200 mL was drained. A urinary tract ultrasound scan revealed bilateral hydronephrosis. In the following 24 hours he had substantial diuresis, voiding 3.5 L, and over the next three days his creatinine fell in stages to 180 μmol/L. He was discharged home with an indwelling catheter for weekly creatinine estimations. Once his renal function had normalised, he underwent a transurethral resection of the prostate six weeks later. He is now voiding well with few urinary tract symptoms.

Rational testing into practice

Think about the last time you referred a patient presenting with chronic urinary retention to a specialist. Did you request an ultrasound and renal function blood tests? How would you investigate these patients before referral? Have you had patients who were still voiding with low pressure chronic retention who were catheterised in the community unnecessarily? Based on reading this article, how would you alter your management approach and explain to your patient?

How patients were involved in the creation of this article

Two patients who presented with chronic retention to our hospital reviewed this paper. The patient with LPCR confirmed how he had few symptoms and felt more awareness is needed of this condition in primary care to foster early diagnosis and appropriate management. We have accordingly highlighted these presentations in the article. We thank these patients for their input.

The patient described in the vignette is fictitious. No patient consent required.

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Figures

Fig 1 An approach to catheterisation in men with chronic urinary retention
Fig 2 CT scan of high pressure chronic retention (HPCR) showing a very distended bladder and bilateral hydrenephrose