

Incontinence





Definition

Urinary incontinence (UI) is the complaint of any involuntary leakage of urine.¹ It results from a failure to store urine during the filling phase of the bladder due to abnormality of bladder smooth muscle or the urethral sphincter. Urine loss is either urethral or extra-urethral (secondary to anatomical abnormalities including ectopic ureters, rectovesical or vesicovaginal fistulae).

Prevalence

It affects about 3.5 million people in the UK, females > males, and increases with age² .

Classification

Stress urinary incontinence (SUI) is involuntary urinary leakage on effort, exertion, sneezing, or coughing, due to hypermobility of the bladder base, pelvic floor, and/or intrinsic urethral sphincter deficiencies.

Type 0 €"report of urinary incontinence, but without clinical signs.

Type I €"leakage that occurs during stress with <2cm descent of the bladder base below the upper border of the symphysis pubis.

Type II €"leakage on stress accompanied by marked bladder base descent (>2cm) that occurs only during stress (IIa) or is permanently present (IIb).

Type III €"bladder neck and proximal urethra are already open at rest (with or without descent). Also known as intrinsic sphincter deficiency (ISD).

Urge urinary incontinence (UUI) is involuntary urine leakage accompanied by, or immediately preceded by a sudden, strong desire to void (urgency). It is a component of the overactive bladder syndrome .

Overflow incontinence is leakage of urine when the bladder is abnormally distended with large residual volumes. Typically, men present with chronic urinary retention and dribbling incontinence. This can lead to back pressure on the kidneys and renal failure in 30% of patients.

Nocturnal enuresis describes any involuntary loss of urine during sleep. The prevalence in adults is 0.5%. Approximately 750,000 children over 7 years will regularly wet the bed. Childhood enuresis can be further classified into primary types (never been dry for longer than a 6-month period) or secondary (the re-emergence of bed wetting after a period of being dry for at least 6 months).

Post-micturition dribble is the complaint of a dribbling loss of urine that occurs after voiding. It predominantly affects males, and is due to pooling of urine in the bulbous urethra after voiding .

Predisposing factors



- gender (female > males)
- race (Caucasian > Afro-Caribbean)
- genetic predisposition
- neurological disorders (spinal cord injury, stroke, MS, Parkinson's disease)
- anatomical disorders (vesicovaginal fistula, ectopic ureter, urethral diverticulum)
- childbirth
- anomalies in collagen subtype
- pelvic, perineal, and prostate surgery (radical hysterectomy; radical prostatectomy; TURP) leading to pelvic muscle and nerve injury
- radical pelvic radiotherapy

Promoting factors



- smoking (associated with chronic cough and raised intra-abdominal pressure)
- obesity
- UTI
- increased fluid intake
- medications
- poor nutrition
- ageing
- cognitive deficits
- poor mobility

Physical examination



Women

Perform a pelvic examination in the supine, standing, and left lateral position with a Sim's speculum. Ask the patient to cough or strain, and inspect for vaginal wall prolapse (cystocele, rectocele, enterocele), uterine or perineal descent, and urinary leakage (stress test). Urethral hypermobility is assessed with the Q-tip test. A lubricated cotton-tipped applicator is introduced through the urethra to bladder neck level. Hypermobility is defined as a resting or straining angle of $>30^\circ$ from horizontal.

Both sexes

Examine the abdomen for a palpable bladder (indicating urinary retention). A neurological examination should include assessment of anal tone and reflex, perineal sensation, and lower limb function.

Investigation



Bladder diaries: record the frequency and volume of urine voided, incontinent episodes, pad usage, fluid intake, and degree of urgency. Alternatively, pads can be weighed to estimate urine loss (pad testing).

Urinalysis: can exclude UTIs.

Blood tests, X-ray imaging, cystoscopy: indicated for persistent or severe symptoms, bladder pain, and voiding difficulties.

Screening tests: flowmetry measures the pressure of urine voided. A low rate indicates bladder outflow obstruction or reduced bladder contractility. The volume of urine remaining in the bladder after voiding (post-void residual) is also useful (<50ml is normal; >200ml is abnormal;

Treatment of sphincter weakness incontinence: injection therapy



The injection of bulking materials into the bladder neck and periurethral muscles is used to increase outlet resistance. Bulking substances include silicone polymers (Macroplastique); cross-linked bovine collagen; Teflon; PTFE; and carbon coated zirconium beads (Durasphere).

Indications

Stress incontinence secondary to demonstrable intrinsic sphincter deficiency (ISD), with normal bladder muscle function. Used in adults and children.

Treatment of sphincter weakness incontinence: retropubic suspension



Retropubic suspension procedures are used to treat female stress incontinence caused by urethral hypermobility. The aim of surgery is to elevate and fix the bladder neck and proximal urethra in a retropubic position, to support the bladder neck, and regain continence. Contraindicated in the presence of significant intrinsic sphincter deficiency (ISD).

Treatment of sphincter weakness incontinence: pubovaginal slings



Indications

Sling procedures are mainly used for female stress incontinence associated with poor urethral function (type III or ISD), or when previous surgical procedures have failed. Also used for incontinence due to urethral damage (following radical pelvic surgery or radiotherapy), and for neurological urethral dysfunction (e.g. myelodysplasia) in both sexes. It is essential that urethral and bladder function is evaluated prior to surgical repair.

Types of sling

Autologous "rectus fascia, fascia lata (from the thigh), vaginal wall slings.

Non-autologous "allograft fascia lata from donated cadaveric tissue.

Synthetic "monofilament polypropylene tape (TVT or tension-free vaginal tape).

Treatment of sphincter weakness incontinence: the artificial urinary sphincter



The artificial urinary sphincter consists of an inflatable cuff placed, via a lower abdominal incision (midline or Pfannenstiel), around the bladder neck in both men or women or the bulbar urethra in men, a pressure-regulating balloon placed extraperitoneally, and an activating pump placed in the scrotum or labia majora.



Incontinence secondary to urethral sphincter deficiency in patients with normal bladder capacity and compliance. In men, it is used for sphincter damage due to prostatectomy (radical prostatectomy for prostate cancer or TURP), pelvic radiotherapy, pelvic fracture, and following urethral reconstruction.

In women it is used after other treatments for incontinence have failed. It can be used for neuropathic sphincter weakness (e.g. spinal cord injury, spina bifida) if the incontinence is not due to bladder overactivity.

Overactive bladder: conventional treatment



Definition

Overactive bladder (OAB) is a symptom syndrome which includes urgency, with or without urge incontinence, frequency, and nocturia. The symptoms are usually caused by bladder (detrusor) overactivity, but can be due to other forms of voiding dysfunction. 17% of the population >40 years old in Europe have symptoms of OAB.

Conservative



Patient management involves a multidisciplinary team approach (urologists, gynaecologists, continence nurse specialists, physiotherapists, and community-based health care workers). Treat any underlying causes (urethral obstruction, bladder stones, spinal disease, or tumour). TURP for bladder outlet obstruction due to BPH can provide symptomatic relief in >66% of men. Treatment of SUI component includes pelvic floor exercises, biofeedback, and high-frequency electrical stimulation (which strengthens the pelvic floor and sphincter by increasing tone through sacral neural feedback systems).



Behavioural modification

This involves modifying fluid intake, avoiding stimulants (caffeine, alcohol), and bladder training for urgency (delay micturition for increasing periods of time by inhibiting the desire to void).

Medication



Anticholinergic drugs act to inhibit bladder contractions and increase capacity (oxybutynin, tolterodine; trospium; propiverine). Oxybutynin also exerts a direct muscle effect and can be administered directly into the bladder (intravesically) in patients performing intermittent catheterization (5mg in 30ml normal saline 8 hourly after emptying the bladder). Contraindications: closed angle glaucoma. Side-effects: dry mouth, constipation, blurred vision.

Tricyclic antidepressants (imipramine) exert a direct relaxant effect on bladder muscle as well as producing sympathomimetic and central effects.

Desmopressin (DDAVP) is a synthetic vasopressin analogue which acts as an antidiuretic. It is used intranasally to alleviate nocturia in adults. Oral DDAVP is effective for nocturnal polyuria.

Baclofen is a GABA receptor agonist, which is used orally or via intrathecal pump in patients with bladder dysfunction and limb spasticity.

Overactive bladder: options for failed conventional therapy



Neuromodulation

Surgery

Auto-augmentation (detrusor myectomy):

Augmentation enterocystoplasty

Conduit diversion



Intravesical pharmacotherapy

Botulinum toxin A (BTX-A) injection therapy acts by inhibiting calcium-mediated release of ACh at the neuromuscular junction, reducing muscle contractility. It is used predominantly for neuropathic bladder dysfunction, but increasingly is being used for failed medical therapy of the OAB in non-neuropaths. It is injected directly into detrusor muscle under cystoscopic guidance