Urinary Incontinence

➔ Involuntary loss of urine due to Abnormal bladder SMCs or deficient sphincter, ectopic ureter causes total incontinence.

1) *Bladder Abnormalities*: filling phase defect.

i. **Detrosor Overactivity**: Neurological Problem (Spinal Cord Injury, radical hysterectomy, radiation Cystitis)
- refers to the observation of involuntary detrusor contractions during filling cystometry

ii. **Low Bladder Compliance:** decreased Volume to Pressure relationship of bladder. Caused by (chronic Catheterization, Prostatic Obstruction or Increased Collagen die to cystitis, DM , MS, disks, spinal cord injuries)

2) Sphincter Abnormalities

i. **Urethral hypermobility:** weakness of Pelvic floor muscle (Bladder neck will descend with Proximal urethra causing urinary leaking)
- Connective tissue disorder, Childbirth, postmenopausal estrogen loss

ii. **Intrinsic sphincter Deficiency:** due to malfunction regardless it's Position,
- Caused by: Surgery, aging, radical pelvic surgery, menopause, Child birth, Obesity.

→ RF: **F**>M, Collagen Anomalies, Obesity, Smoking, UTI, **Aging**, decreased mobility, Prostate / Pelvic Surgery, genetic Predisposition, Neurological Disorder

→ Types

1- Stress (Recurrent UTI is not RF in it): Urine leak with exertion, Sneezing, cough; Due to hyper-mobility of the bladder and intrinsic sphincter deficiency… No urge to urinate prior to the leakage!
- More in F > M —> due to sphincter abnormalities

2- Urge : m> f, Leakage with Sudden Strong desire to void urine; due to detrosor instability neurogenic bladder —> detrusor myopathy, neuropathy.

3- Mixed: Stress and urge UT —> Tx the dominant one

4- Overflow: Painless loss of urine with no warning or triggers —> Due to chronic Urinary retention (BOO) or by Detrusor underactivity —> continuous leak & incomplete emptying / impaired voiding mechanism.

5- Functional: Normal Voiding System but have difficulty to reach toilet—> psychological impairments or physical (infx, Atrophic urethritis, Endocrine, Reduced mobility)

6- Total: Constant leakage during day & night —> Urogenital fistula, Scarring and fibrosis of urethra,

→ Stages:

0→Incontinence without clinical sign
1→leakage during stress & Descend of bladder <2 am of symphysis pubis
2→leakage during stress & Descend of bladder >2 am of symphysis pubis
3 →Bladder Neck & Proximal urethra is ofened" (During rest)

→ Presentation

- Hx: ask abut LUTS, tiggers for incontinence (coughing, sneezing, exercise, position, urgercy)
  - Onset and course , triggers, Frequency, Nocturia Volume, Intermittent or slow stream, Straining to void, Severity, Incomplete emptying, Hesitancy
  - Sexual, prostate disease? Comorbidities? pelvic surgery? Obstetric history? Drugs ,

- PE: -examine Abdomen for Palpable bladder (chronic retention) -Ask Pt to cough/sneeze & inspect for Prolapse & Urinary leakage

→ Investigation: dx clinically !!

Urinalysis (if UTI Tx first) , Bld test, MRI, Cystoscopy(tumor) , PVR volume (must be <50 .. if > 200)
Bladder Diaries (record frequency, volume of urine voided, Incontinence Episodes), Urodynamic studies

→ Management: فهم جدًا

Find the cause —> 1) conservative management for all —> 2) specific management based on the subtype.

1) Tx the comorbidities, lifestyle modification & physical therapy (Kegel exercises), Bladder training
2) For ***Urge Urinary Incontinence*** / Overactive bladder (OAB):
   - **Medication** To inhibit Contraction: TCA, desmopressin (ADH), **Anti-cholinergics** (Oxybutinin), **a** blockers B3 agonist (not for HTN) … Injection of **botulinum** Toxin via cystoscopy
   -**Surgery**: (Detrusor myectomy/ Augmentation cystoplasty) to ↑ functional bladder capacity, Electrical stimulation/ Sacral nerve root stimulation/ PTN stimulation (increase the threshold)

   For stress Incontinence
   - **Medication** : Duloxetine (SNRI): to enhance sphincter contraction
   -**Surgery**: Male —> Transurethral bulking agents, Perineal slings, Artificial urinary sphincter
   Female —> TVT: Suburethral **Sling Procedure**

For overflow Incontinence —> emptying the bladder with a catheter, Artificial implantable u. sphincter

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Clean intermittent self catch / low infx risk

➔ As the bladder fills, (first no change in pressure) the pudendal nerve becomes excited. Stimulation of the pudendal nerve results in contraction of the external urethral sphincter. This increase in urethral pressure with filling is the ***continence reflex.***

Neurogenic Bladder

detrusor underactivity- overactivity +/- detrusor underactivity to overactivity +/- coordination

History

➔ Irritative Sx, Obstructive Sx: Hesitancy, straining, poor stream, intermittency, interruption, dribbling, the sensation of incomplete voiding.

Physical Examination

➔ General PE, Abdominal Examination, Neurological Examination , Anal and BCR

Dx :

Hx& PE & Urinalysis …to know the type —>PVR, cystometrography, peak urinary flow rate testing
….. to know the etiology —> UA, Culture, CBC, HbA1c, KUB, CT brain, MRI spine , cystoscope, cytology

Suprapontine Lesion (Brain)	**Uninhibited** Bladder	Predominantly **Storage** Sx / **Urge incontinence** +large amount of **Urine leaks** before reaching the Bathroom	**Insignificant** PVR urine Volume	Detrusor **Hyperreflexia** (= overactivity) **+ Synergetic coordination**	The Bladder empties too quickly and too often → relatively **low quantities** and storing of urine is difficult	**CVA** / Brain **Tumor** / **Parkinson** Disease / **Shy drager Syndrome.**
Spinal (Infrapontine-suprasacral) lesion	**Spastic** bladder Or **overactive** bladder	Both storage and voiding symptoms	PVR urine volume usually **raised**	**DSD-DH** = Detrusor sphincter **dyssynergia** + Detrusor hyperreflexia	When **both** overactive **(detrusor + sphincter)** -> desire to urinate but only **small** amounts may dribble out	Damage to the spinal cord above T10
Sacral cord Injury (Motor)	Detrusor **areflexia** with sensation	Urinary **retention** +difficulty eliminating Urine **+ Overflow incontinence**	PVR urine volume **raised**	**Hypocontractile** or **acontractile** detrusor	Pt will **sense** when the bladder full, but the detrusor muscle **will not** contract Bladder over distends until the Urine spills out	Spinal **tumor** **Herniated disc**
Sacral cord Injury (Sensory)	Detrusor **areflexia without** sensation	Predominantly **Storage** Symptoms Urinary **retention** +difficulty eliminating Urine **+ Overflow incontinence**	PVR urine volume raised	**Hypocontractile** or **acontractile** detrusor	Pt **does not** sense when the bladder full Bladder over distends until the Urine spills out	Spinal **tumor** **Herniated disc**
Peripheral nerve injury / Infra sacral lesion	Hypocontractile bladder / Detrusor areflexia without sensation	Urinary **retention** + Overflow **incontinence**	PVR urine volume **raised**	**Hypocontractile** or **acontractile** detrusor	Hypocontractile bladder / silent , painless distention of the bladder	Prolonged vaginal delivery / DM /AIDS

Urodynamic testing

- To help diagnose problems with urination and/or urinary incontinence —> test the function of the LUT

➔ ***Filling phase***

1) Maximum capacity of the bladder (age +2 * 30)
2) Compliance of detrusor muscle (<12 cm H2O)
3) Detrusor muscle contractions (normally none during filling … decr in infl. Scar, stone)
4) Cough test (Look for stress incontinence)
5) Bladder sensation (Report urge to urinate and record the volume, normally 150-200) (intact sensation, hypersensitive bladder, and hyposensitive bladder) / felt as pain

➔ ***Voiding phase***

1) Urine flowmetry (>200 ml for max flow to be calculated, 20-25 ml/sec males, 25-30 ml/sec female) < 15 possible…… < 10 definitive
2) Detrusor voiding pressure (Normal max 30-60 males, 20- 40 females)
3) Voided volume (calculate PVR)
4) The Cough