Neurological conditions and their impact on bladder and bowel function

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Introduction

- Neurophysiology of Bladder and Bowel control
- Neurological conditions affecting bladder and bowel function in geriatrics
- Treatment -brief
- Conclusions

Urinary incontinence

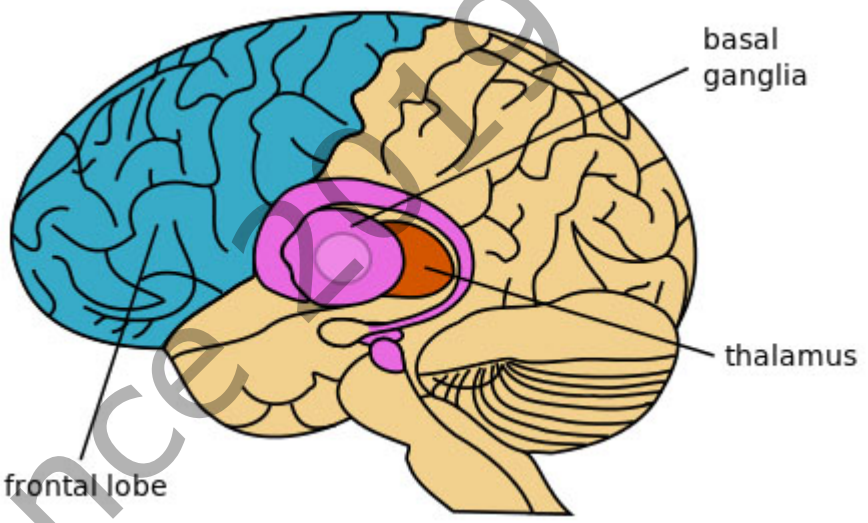
- Systematic review :cumulative data of 12 studies (Chiarelli, Bower et al.2005)
- Pooled age-specific prevalences for females are
- 20% (60 to 69 years)
- 23% (70 to 79 years)
- 28% (over 80 years)
- Pooled age-specific prevalences for males are
- 7 % (60 to 69 years)
- 11% (70 to 79 years)
- 15 % (over 80 years)

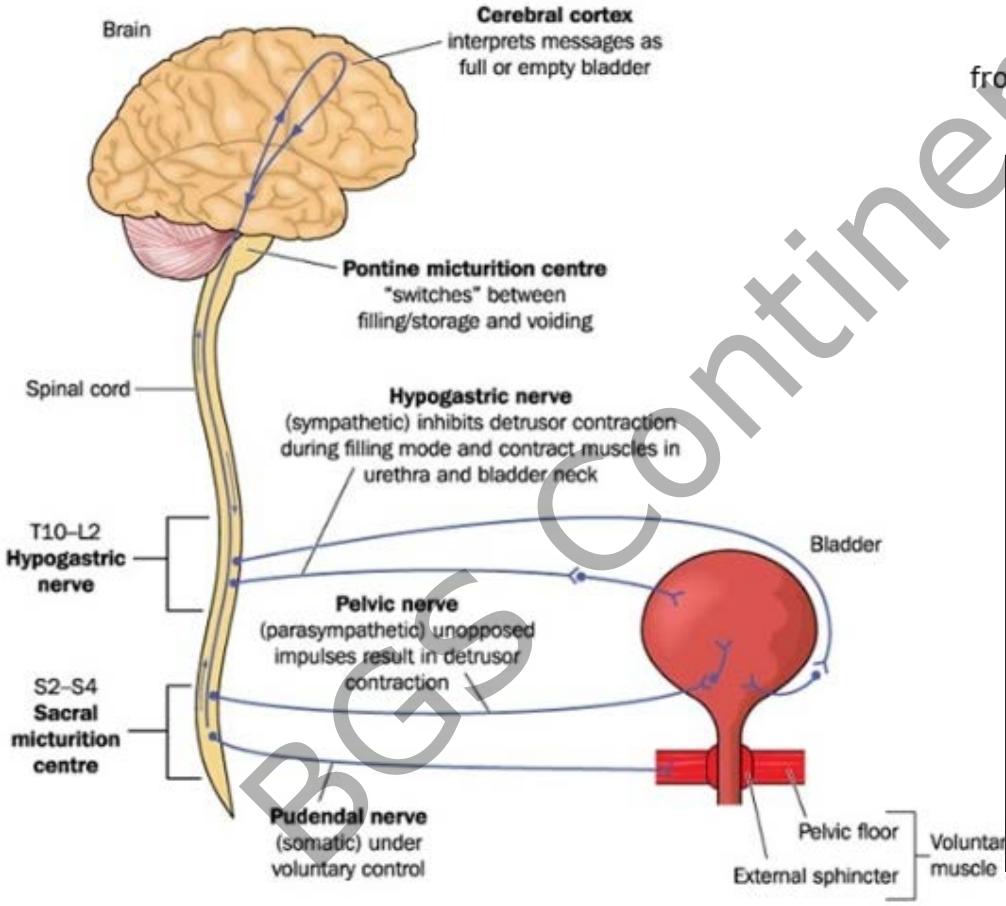
Introduction (contd)

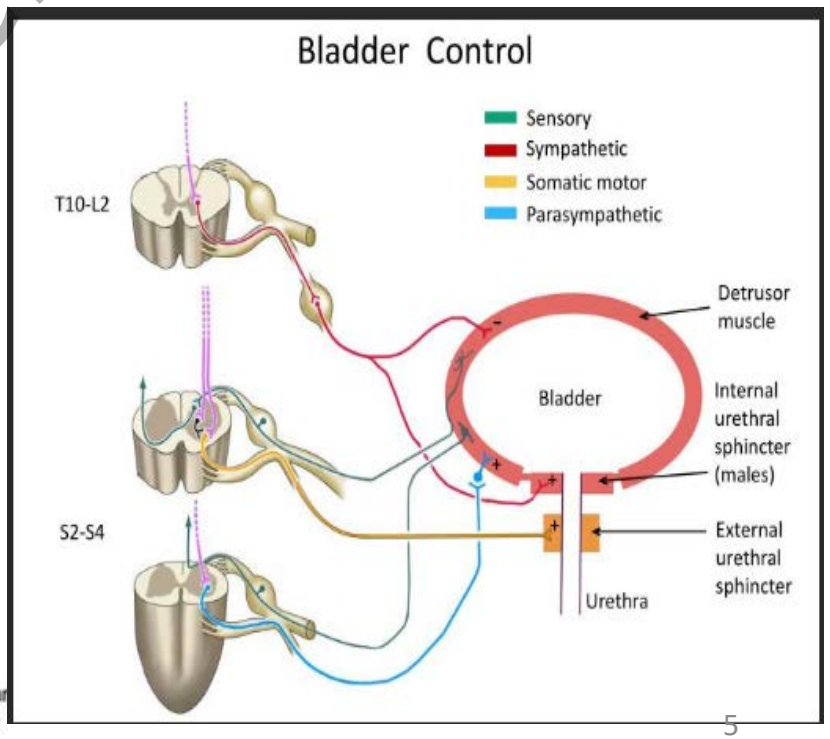
- Prevalence of faecal incontinence and double incontinence is similar in both men and women
- Men are half as likely as women to get help
- Consequences:

1. Associated with lower quality of life
2. Tendency to alter daily routine (avoiding going far from home, reduced work hours)
3. Social isolation and loneliness

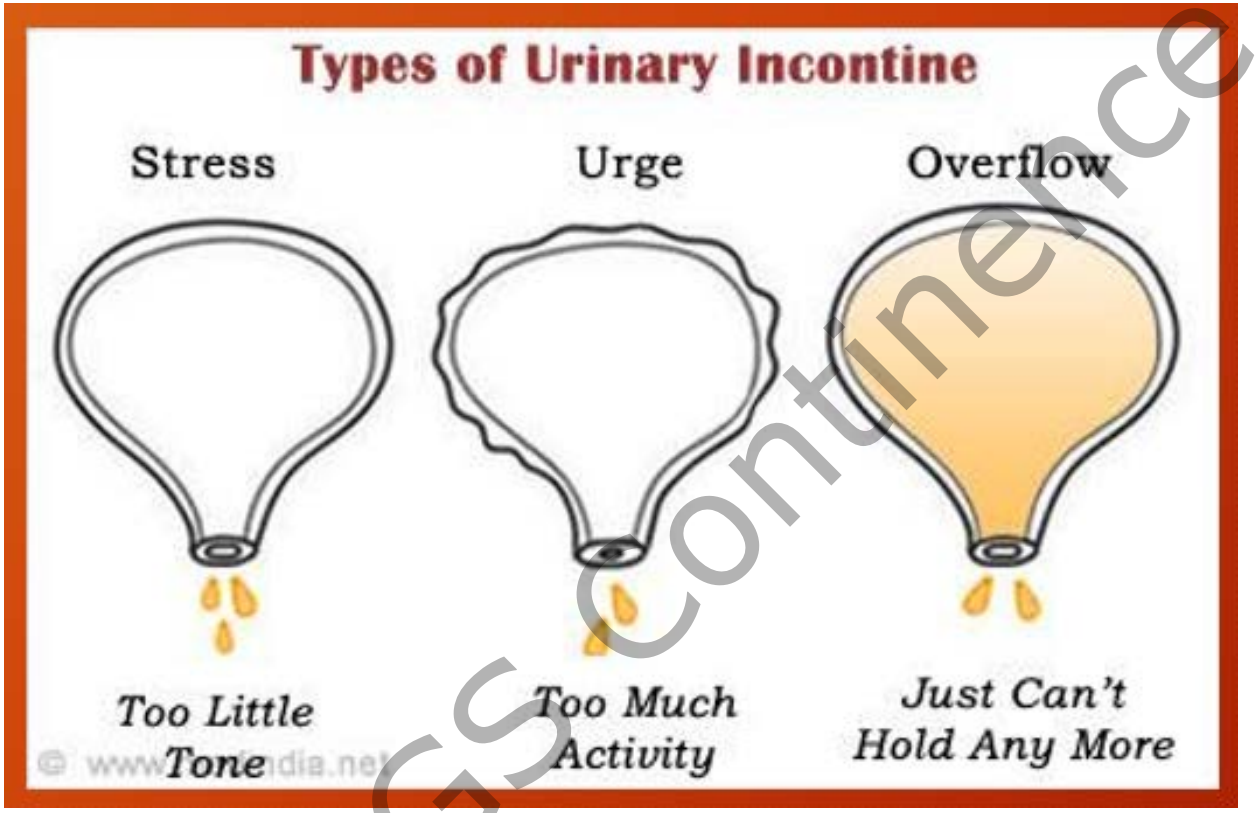
Neural control of bladder

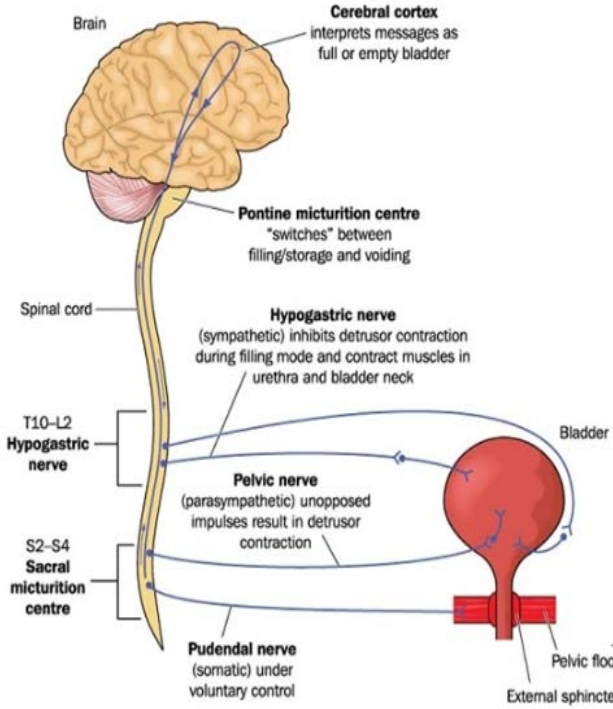




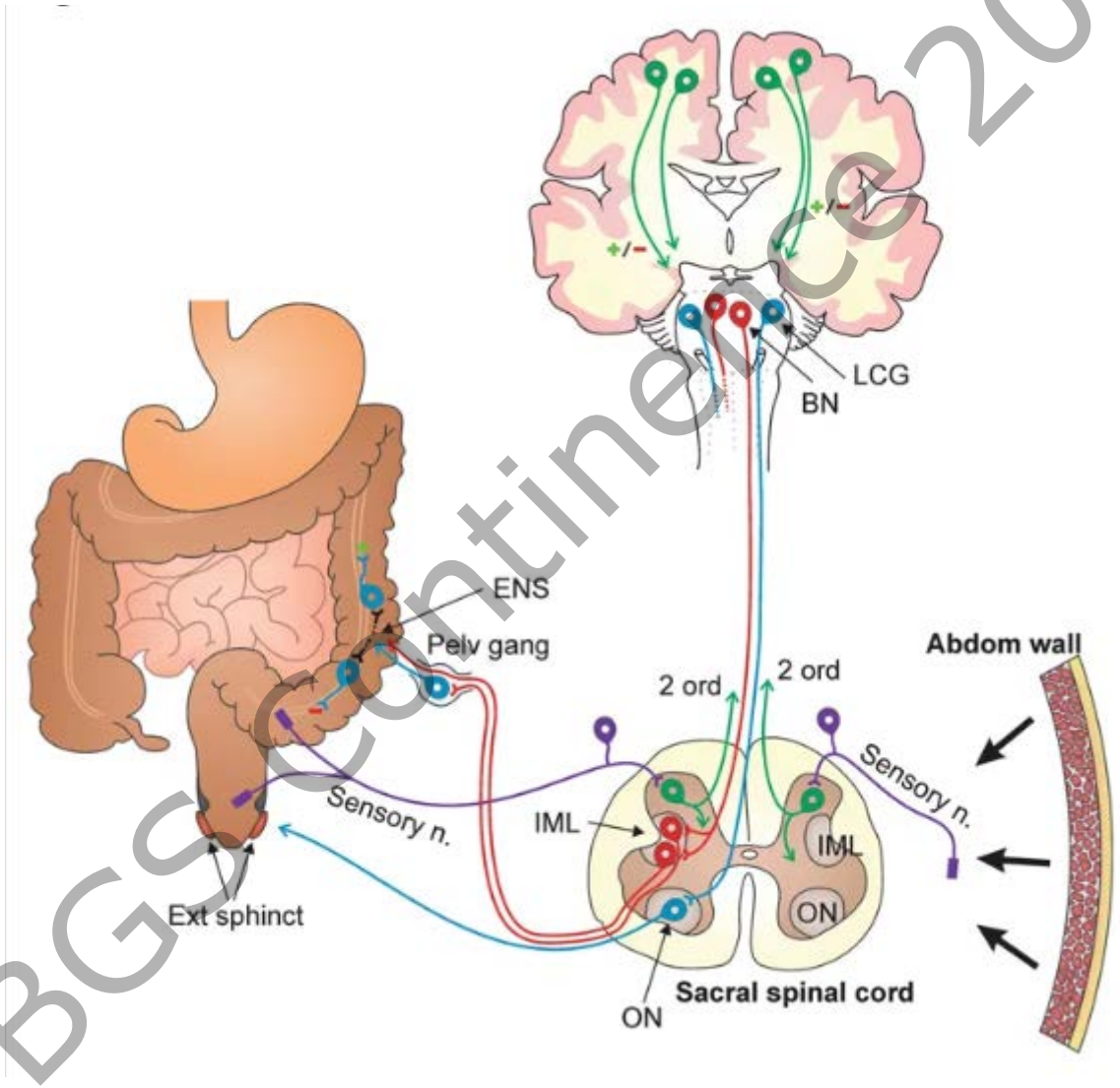


Types of urinary incontinence





Neural control of bowel and defecation



Neurological conditions causing bladder and bowel dysfunction in Geriatrics

- Stroke –ischemic and hemorrhagic
- Epileptic seizures and black outs
- Dementia including NPH
- Parkinsonism syndrome : PD Vs PLUS
- Frontal lobe tumor
- Spinal cord disease and cuada equina syndrome
- Peripheral nerve disease including GBS
- Drugs: Anticonvulsants, anticholinergics, sedatives
- Chronic infections: Neurosyphilis , HIV

Lesions of the medial frontal micturition center

- Activation of the pontine and spinal micturition centers when the bladder is full → urinary incontinence (automatic bladder)

- Frontal lobe tumor, ACA territory stroke

Acute Stroke

- ½ of patients loose control of their bladder
- 1/3rd do experience loss of bowel control
- Causes :

1. low GCS
2. Poor mobility
3. control centre affected
4. communication difficulty
5. Constipation
6. medicines- diuretics

Prognosis after stroke

- 15% of stroke survivors continue to have continence problems a year after their stroke

- Easier to regain bowel control than bladder control

Dementia and incontinence

- Advanced stages of dementia:

1. inability to recognize the need to use the restroom
2. forgetting where the bathroom is located
3. Area of the brain predominantly affected
4. Memory problem
5. Mobility
6. Communication
7. Multifactorial : infections, medications, clothing that is difficult to remove and constipation

Normal pressure Hydrocephalus

- First described by Hakim and Adams in 1965
- Incidence : 5 to 181 per 100,000

NPH (contd)

- Gait disturbance: Short stepped, magnetic and wide based
- Urinary incontinence: detrusor overactivity: result in urinary frequency, urgency, or frank incontinence
- Dementia: Frontal and subcortical deficits (psychomotor slowing and impaired attention, executive dysfunction)
- Impairment of memory and orientation are mild (Vs Alzheimer's)

Pathophysiology of NPH

- Aetiology remains controversial : theories

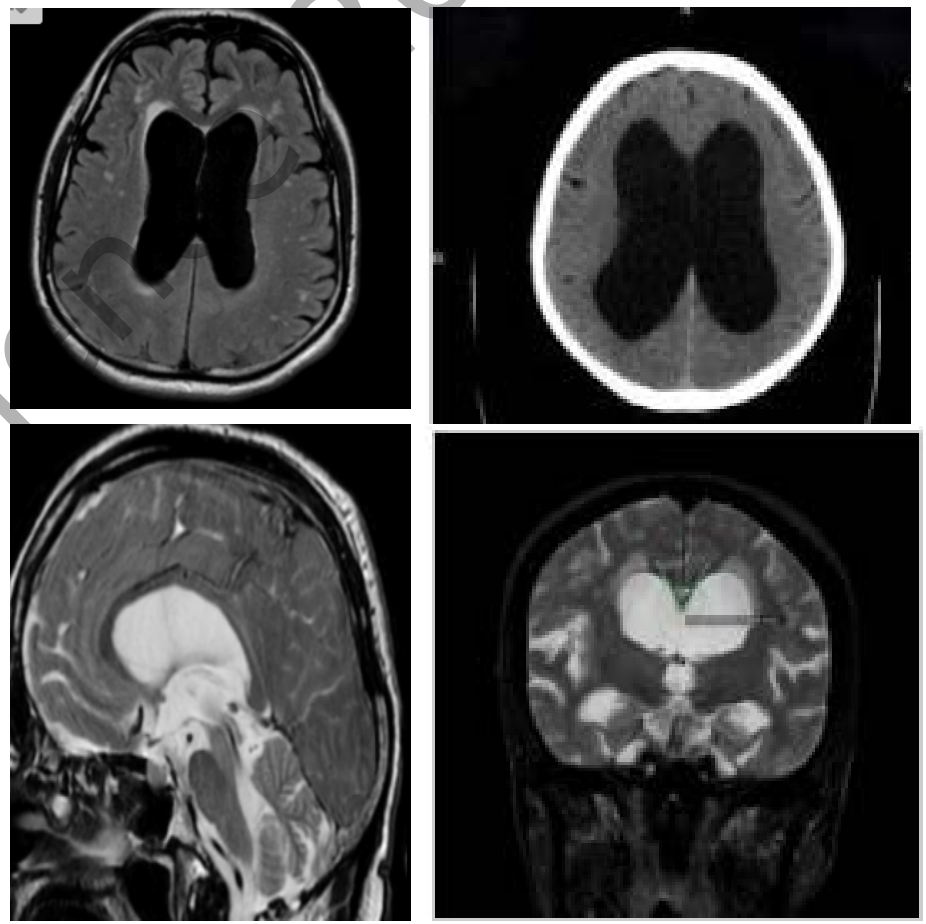
1. Obstructive type of communicating hydrocephalus due to reduced of CSF absorption
2. Weakening of the ventricular wall due to periventricular white mater ischemic damage
3. Interstitial edema in periventricular white matter → impaired blood flow or metabolism in vital prefrontal pathways

Investigations in NPH

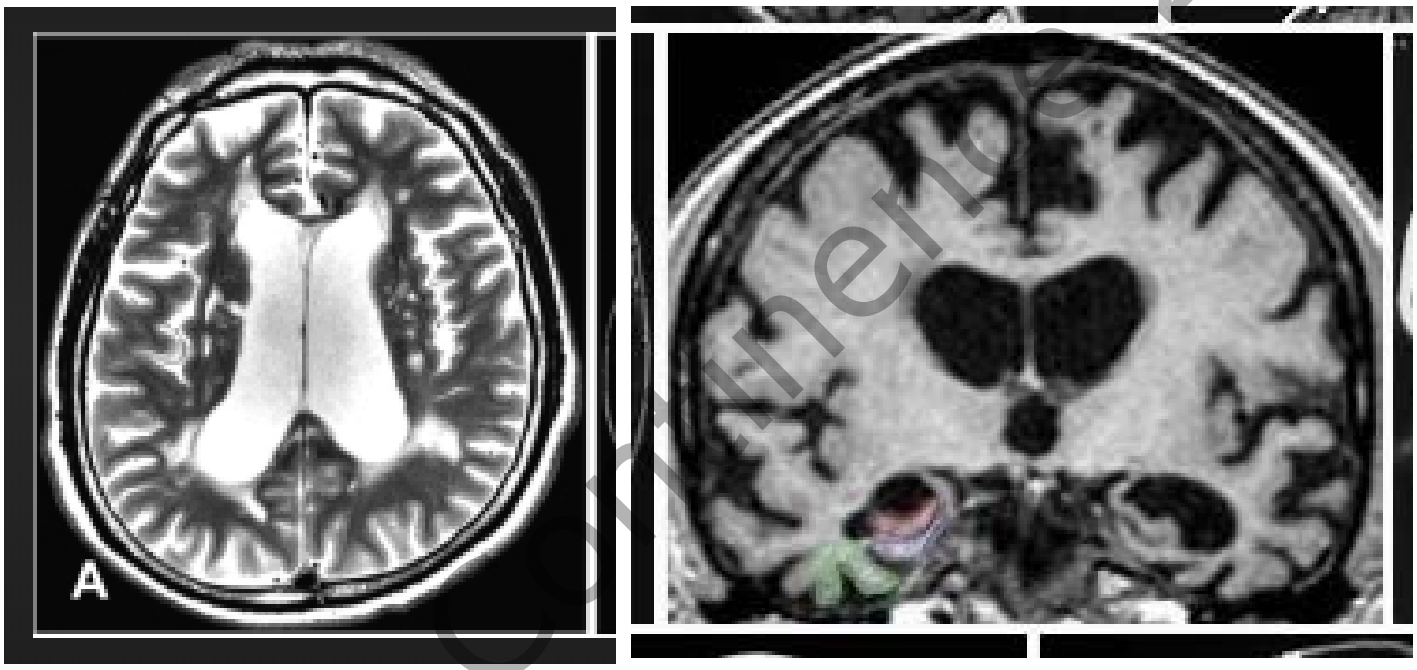
- CSF tap test: remove 30-40ml CSF
- mean CSF opening pressure :normal (<20 cmH_2O or 13 mmHg)
- CSF analysis: Normal cell count, protein and sugar
- Improvement in gait and neuropsychology following the tap test

Brain imaging in NPH

- Increased Evans index >0.3
- Widening of the temporal horns of the lateral ventricle >6 mm
- acute callosal angle



Differential diagnosis



Favourable prognostic factors with VP shunt

1. Short duration of presurgical symptoms (less than 6 months)
2. Onset of gait disturbance before dementia
3. Temporary symptom relief from a CSF tap test
4. Absence of significant cerebral vascular disease
5. Presence of an aqueductal flow void on T2 imaging

Complication of VP shunt

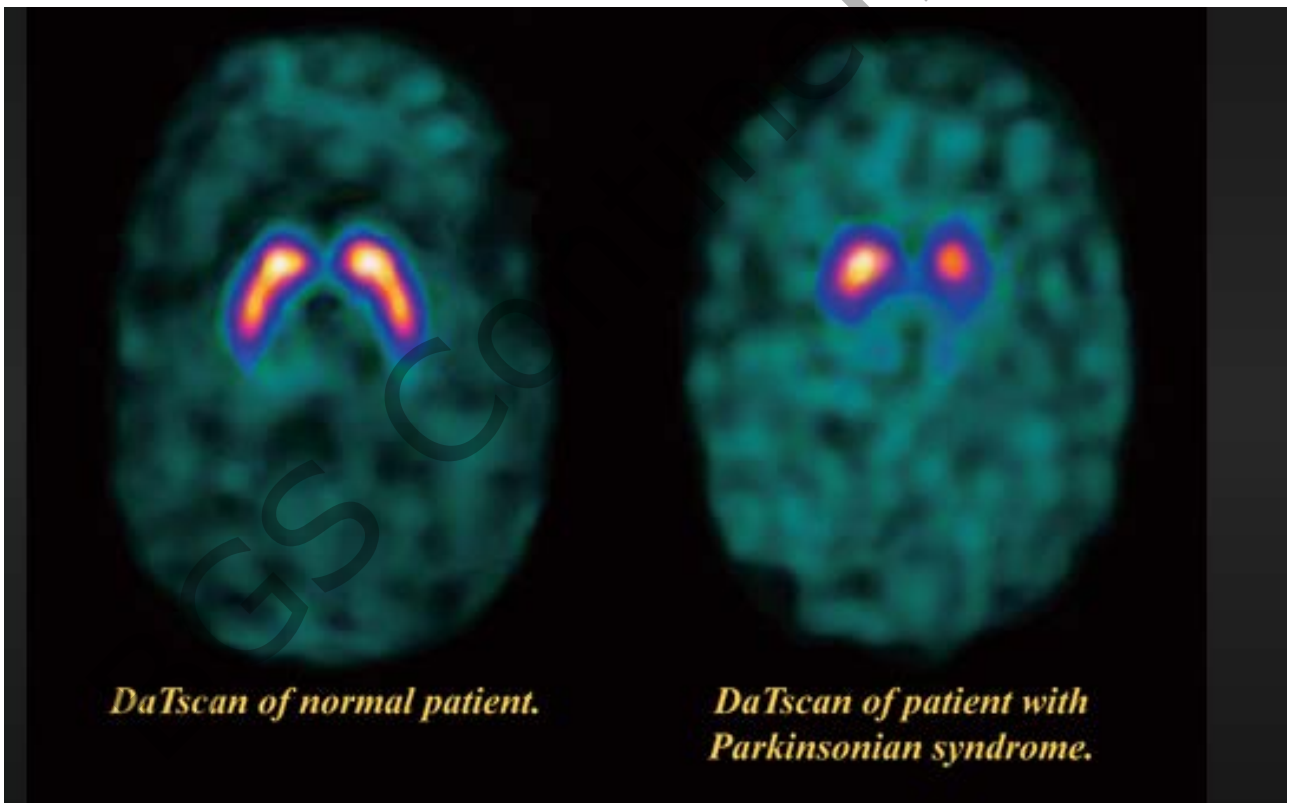
- Shunt malfunction (20%)
- Subdural hematoma (2-17%)
- Seizure (3-11%)
- Shunt infection (3-6%)
- Intracerebral hematoma (3%)

Parkinsonism: Urinary 30-40%

- Nocturia
- Frequency
- Urgency
- Urge incontinence (15%)
- Hesitancy and retention

Parkinson's disease Vs PLUS syndrome

- PD: Urgency years after diagnosis
- MSA: overflow incontinence
- Within one year of diagnosis: Red flag for PD



Pathophysiology of urinary symptoms in Parkinsonism

- Under activation of the D1 receptors → failure to inhibit the urination reflex (McDonald et al. 2016)

- Dystonia of bladder sphincter : incomplete emptying
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Gastrointestinal symptoms in Parkinsonism

- Constipation starts before motor symptoms
- Bladder symptoms are relatively later
- **Causes of constipation**:

1. slowed colonic transit time
2. hypokinesia of abdominal musculature due to rigidity
3. abnormal motor control of the anal sphincter
4. central pathology
5. functional outlet obstruction: paradoxical external anal sphincter contraction due to focal dystonia
6. Limited mobility
7. Diet
8. polypharmacy side effects

Spinal cord disease

- Cervical Compressive myelopathy due spondylosis and tumour
- Spinal cord injury due to trauma
- Myelitis
- Spinal stroke

Spinal cord injury (SCI)

- Spinal shock (up to 3months): atonic bladder (parasympathetic denervation) → later, detrusor over activity

- Disturbances of bowel function occur in over 80%

- Overflow incontinence : inability to empty the bowel when defecation is convenient → leakage of bowel contents that occurs at inappropriate times

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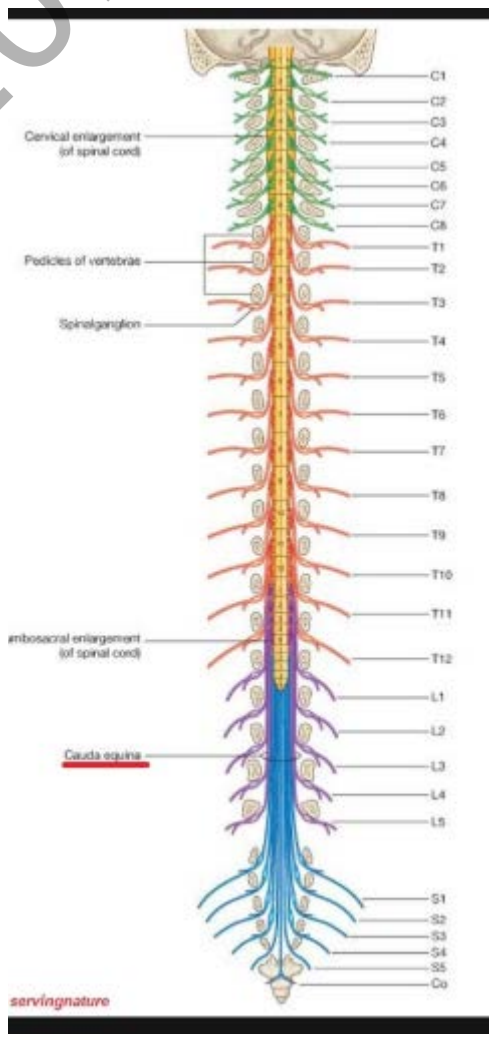
Cauda Equina Syndrome

- Trauma, herniated discs, spinal stenosis, tumors

- Low back ache, pain in one or both legs
- **Bowel disturbance – bowel incontinence, constipation , loss of anal muscle and peri-anal sensation**
- **Bladder disturbances - urinary retention, urinary hesitancy and/or incontinence, and decreased urethral sensation**
- Lower extremity muscle weakness and decreased sensation
- reduced or absent DTRs



Neuropathy and continence

- Most common cause : Diabetic neuropathy
- Overactive bladder and urge incontinence to decreased bladder sensation and overflow incontinence

- Guillain-Barré syndrome (GBS): 20-30% of patients
- Constipation or, occasionally, paralytic ileus
- bladder dysfunction with urine retention

- HIV-associated neuropathy
- Vitamin B12 deficiency related neuropathy

Treatment of Urinary symptoms

- Look for other causes: local causes such as infection, BPH, constipation, offending drugs
- Diary, and Bladder training
- Mobility issues: Levodopa, pain management
- Solifenacin : Urgency and urge incontinence
- Deep brain stimulation may improve urinary urgency in PD
- Desmopressin for Nocturia

Botulinum toxin injections to the bladder muscle

- Improvement in urinary symptoms - incontinence, urge symptoms, urinary frequency, bladder capacity and nocturia (Anderson et al. 2014)
- Potentially serious side effect : not being able to empty the bladder.
- Can last for months and may require self-catheterization

Treatment of Urinary symptoms (contd)

- Urology consultation and continence nurse

- Atonic bladder: Bethanechol , intermittent self catheterisation, supra pubic catheter

Treatment of lower GIT problem

- Laxatives
- With hold Offending drugs
- Hydration
- Abdominal massage
- Palliative care and gastroenterology referral

Conclusion

- Various neurological conditions affect bladder and bowel control
- Poor QOL
- Aetiology could be multifactorial
- Treat the cause if feasible
- Symptomatic and supportive Rx

- Thank You
- Q