Case 8

Ms. C is a 65 yo right-handed woman slipped and fell and complains of significant pain in the lumbar region. X-rays demonstrate an L1 fracture. She is on the orthopaedic rehabilitation unit. Referral to PM&R states "Please assess. Significant pain and unable to walk"

1. **What is your DDx for Ms. C not being able to walk? What are the key features you would look for on physical exam.**

Potential Answers:

- Pain
- Cauda equina syndrome
- Conus medullaris syndrome
- Epiconus syndrome
- R/O Lumbosacral plexopathy and traumatic peripheral neuropathy
- R/O alternate neurologic diseases which could explain a fall (balance issues) and inability to ambulate → Cervical myelopathy, Stroke, ALS, Parkinsonism, polyneuropathy, …

On Physical Examination, foley is in place. There is a decreased left ankle jerk reflex in addition to decreased motor and sensory function in the left L5 and S1 segments. Toe flexors and plantar flexion are also decreased bilaterally. There is absent light touch and pinprick sensation in S2 to S5 dermatomes bilaterally, absent deep anal sensation, and absent voluntary anal contraction. Bulbocavernosus and anal reflexes are absent. She is complaining of significant constipation requiring laxatives and is alternating between loose stool and hard stool.

She is having severe shooting pain down her left leg. She takes Pregabalin 150 mg bid and it makes her feel very drowsy.

2. She tells you, "I am really sensitive to medications in general. I don't like taking medication" **What is your approach to pain management for Ms. C?**

- Possible answers: Tx mood/anxiety, sleep, bowel and bladder; According to Canadian Pain Society guidelines (can switch to gabapentin, add SNRI, try to avoid TCA due to cognitive/drowsiness side effects, try to avoid opioids due to constipation and sedation, possibly try cannabinoids, interventional strategies - facet blocks)
- CanPain SCI guidelines (update 2019):
- https://www.nature.com/articles/s41393-021-00744-z
- Ensure non-pharmacologic strategies suggested:

  Examples:

  - Mindfulness Meditation
  - Music
  - Physical Activity, Movement

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- Breathing
- Being in Nature
- Distraction
- Desensitization
- Sleep hygiene
- Pacing
- Humour
- Socialization
- Desensitization

The Foley catheter is removed in context of a voiding trial.
She feels a vague fullness but is not able to urinate. Her nurse performs a bladder scan and there is 1 L of urine in the bladder.

3. **What is your approach to her bowel and bladder management?**

We suspect in this case a complete (L4 AIS grade A) conus medullaris syndrome, and MRI of the throracolumbar region is recommended to confirm radiologic involvement of the conus (see below). In some cases, we may also find hypoesthesia in the T11-T12 dermatomes due to adjacent radiculopathies in the context of a thoracolumbar (T12 or L1) burst fracture. EMG in lower limb may also be asked if traumatic peripheral neurological involvement is suspected (plexopathy, radiculopathy, neuropathy).

Re-assessment of the sacral examination is recommended during the first weeks of the injury to assess for the main differential diagnosis, which consists of the presence of a severe epiconus syndrome with associated spinal shock. In that case, the MRI would demonstrate involvement of the epiconus area. In a severe epiconus syndrome, transition from an areflexic to a reflex neurogenic bowel/bladder dysfunction would be expected, along with the emergence of the spinal shock, in the weeks following the injury. On the other hand, persistent atonic neurogenic bladder/bowel dysfunction is expected for conus medullaris syndrome.

In addition to neurogenic sacral dysfunction, the epiconus syndrome is generally associated with a *proximal and generally symmetric upper motor neuron* involvement of the lower extremities (after the emergence of the spinal shock), as opposed to a generally *distal symmetrical* lower motor neurone syndrome of the lower extremities in the conus medullaris syndrome. Cauda equina syndrome is associated to a *"patchy"* lower motor neuron involvement of the lower extremities. Lower limb neurological functional may be preserved in a conus medullaris syndrome (since lower limb function is rostrally located to sacral segments in the spinal cord).

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After identification of an acute complete conus medullaris syndrome associated to severe atonic neurogenic bladder and bowel dysfunction, management will consist of:

- Rapid management including specialized sphincter rehabilitation if patient is eligible (i.e. patient demonstrates the motivation, cognitive and physical requirements for learning and managing bladder and bowel function with/out assistive methods)
    - For bladder: 1) initiate clean intermittent catheterization every 4 to 6hours, (sphincter rehabilitation is provided in specialized intensive functional rehab centers where patients will be taught to manage their sphincter independently); 2) perineum/pelvic rehabilitation may be recommended in incomplete injuries to strengthen pelvic muscles; 3) specialized sexology may also be considered due to associated neurogenic sexual dysfunction. 4) Flomax (Tamsulosin), an alpha-adrenergic antagonist can be used to reduce functional urethral resistance during voiding and improve flow rate in patients with neurogenic bladder dysfunction.
        - Goal of bladder management is to preserve motility of the bladder wall (prevent loss of bladder compliance), prevent overflow incontinence, bladder retention and other bladder complications.
    - For bowel management, specialized rehabilitation is also required to provide education for independent management of regular bowel movements in a socially acceptable amount of time and prevent complications (incontinence, constipation, ileus, etc.). Management for atonic neurogenic bowel dysfunction may require: 1) manual digital evacuation, 2) use of laxatives, and bulking agents may be considered to maintain stool consistency (Bristoll 3-4). Bowel movements in atonic bowel dysfunction are generally recommended in the morning, taking advantage of the gastro-colic reflex. In addition, evacuation in the morning may help patients resume leisure and professional activities (since they are vulnerable to stool loss in the context of weak perineum muscles). Some individuals may require stool evacuation twice a day for this reason.

It is now 1 year post SCI. She has seen the psychiatrist and she is on an SSRI and feels that her mood is stable. She has always been an active person who enjoys running, squash, and skiing. She is single and has been living in a long-term care home because her home was not wheelchair accessible and she was not able to walk independently with a walker. She can walk therapeutically for short distances with a 2ww and a left knee-ankle-foot orthosis. She continues to have severe pain and has significant constipation with occasional episodes of loose stool from taking the laxatives. She performs intermittent catheterizations. She says that she has lost most of her friends because they were all active and she can't do activities. She is an only child, her parents have passed away and she has no family support.

4. **Ms. C would like to consider MAID. Her goal was to wait 1 year post SCI to see how life would be. She does not want to live like this. How do you proceed?**

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Begin by better understanding her reasoning for considering MAID. Address all the concerns and document the reasons behind her wishes. She may bring up issues of inadequate pain management and neurosacral dysfunction as main reasons for wanting MAID. These should be investigated and explored so long as she consents. Increased pain and change in bowel/bladder function can be explained by improper or inadequate management, natural evolution of the original SCI, or a new neurologic lesion (junctional syndrome causing new SCI, syrinx, charcot spine, hernia, degenerative spinal disease, etc.)

The laws on MAID vary slightly between provinces and governing health bodies. For simplicity, we will address the federal MAID laws, which are:
https://www.justice.gc.ca/eng/cj-jp/ad-am/bk-di.html#s1

As of March 17, 2021, persons who wish to receive MAID must satisfy the following eligibility criteria:

- Be 18 years of age or older and have decision-making capacity
- Be eligible for publicly funded health care services
- Make a voluntary request that is not the result of external pressure
- Give informed consent to receive MAID, meaning that the person has consented to receiving MAID after they have received all information needed to make this decision
- Have a serious and incurable illness, disease or disability (excluding a mental illness until March 17, 2024)
- Be in an advanced state of irreversible decline in capability
- Have enduring and intolerable physical or psychological suffering that cannot be alleviated under conditions the person considers acceptable