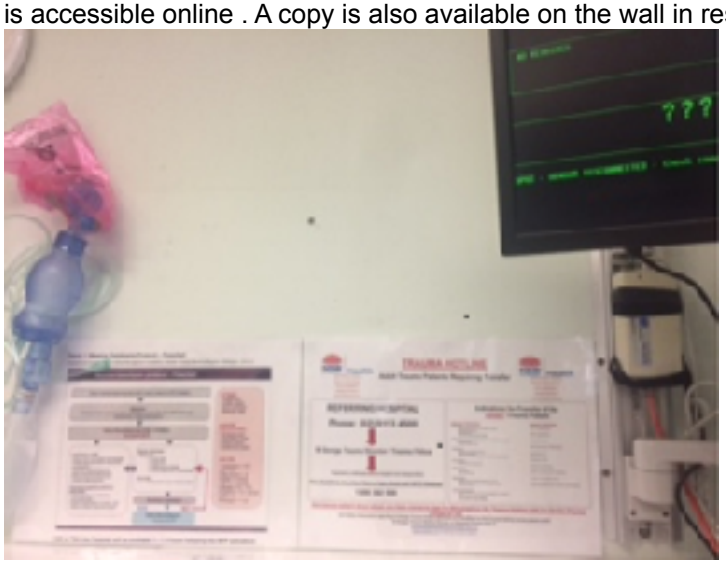
The Weekly Probe

27th January 2017 **Volume 23 Issue 4**

Congrats – congratulations to both Dee and Sue who were both awarded their 20 year service award this week. Well done!

Massive Transfusion Protocol- last week it was mentiond that there is a new MTP protocol and this is accessible online . A copy is also available on the wall in resus.



THIS WEEK

Last Week's Case – Cauda Equina Syndrome
Concussion Advice
Next Week's case
Quote / Joke of the Week

LAST WEEK'S CASE - CAUDA EQUINA SYN

A 32yo lady presents with urinary incontinence , L5S1 + perianal hypoaesthesia ~ 3 weeks post nerve root injection- minimal pain . T 38C - normal power - S1 and perianal hypoaesthesia- hyporeflexia AJ

UA – nitrites – bladder scan post void 130ml

MRI showed - - "Severe spinal canal stenosis at L5-S1 secondary to disc protrusion with associated narrowing of the right subarticular recess and impingement of the descending right S1 nerve root.
- The ill-defined low T1/T2 focus located in the canal at L5/S1 may represent a small haematoma and exacerbates the canal stenosis".

A laminectomy and "flavectomy" was performed with r/o resection of a large disc fragment compressing the thecal sac and right S1 nerve root

Post operatively no improvement of symptoms. Urine grew E. Coli- blood cultures –ve

What is Cauda Equina syndrome and what can we do to identify this?

We see a number of patients with low back pain. However one neurosurgical emergency that we should keep an eye out for is cauda equina syndrome.

Anatomy As the name implies it is a neurologic disorder that is caused by compression of the spinal nerve roots comprising the cauda equina, which arise distal to the tapered end of the spinal cord (which terminates at L2- conus medullaris). It consists of the second through fifth lumbar nerve pairs, all sacral nerve pairs and the coccygeal nerve.

The structures within the cauda explains the symptoms and signs encountered when this structure is compressed. These nerve roots supply sensory and motor innervation to the pelvic organs, lower limbs and the external anal and urinary sphincters. They also provide parasympathetic innervation to the bladder.

A reminder on the dermatomes and myotomes (reflex changes). The easiest way to remember is **1-2, 3-4** –the ankle jerk is S1-2 the knee jerk is L34

– ankle PF(=AJ) is thus S1-2 while DF is above this L4-5AJ (ie 4,5-1,2)

- Knee ext (= KJ) L3-4 - knee flex is below this L5S1 (ie 3,4-5,1)
- Hip - one level above the knee – HF L23 – HE L45 (2,3-4,5)

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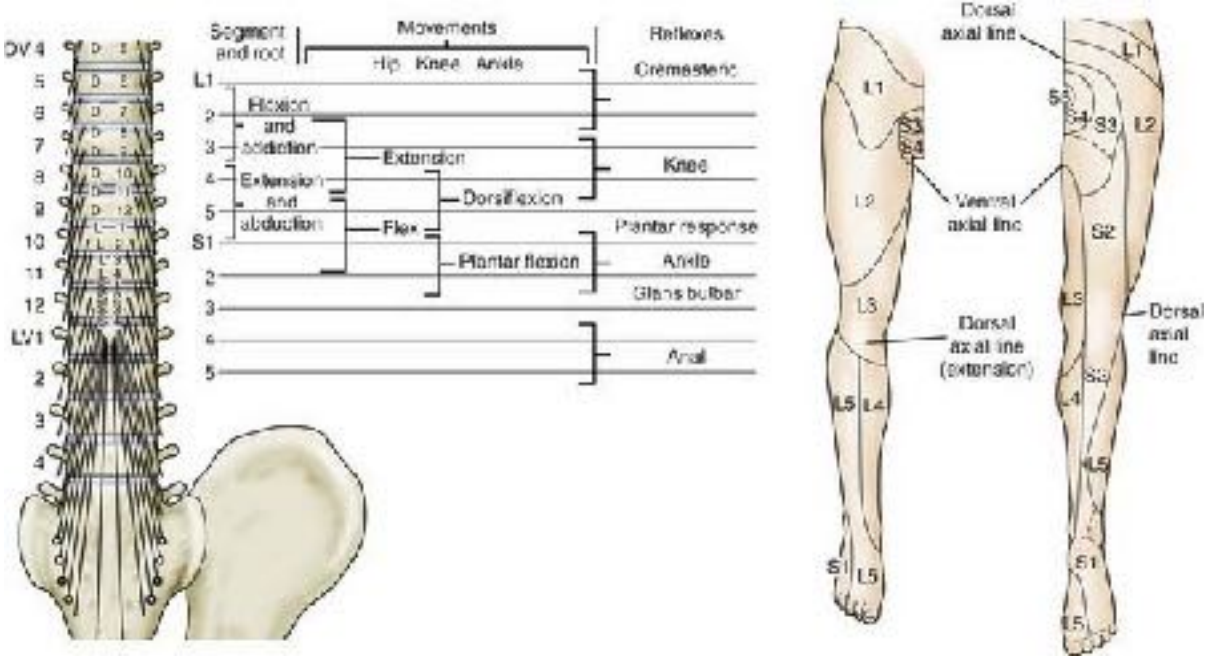
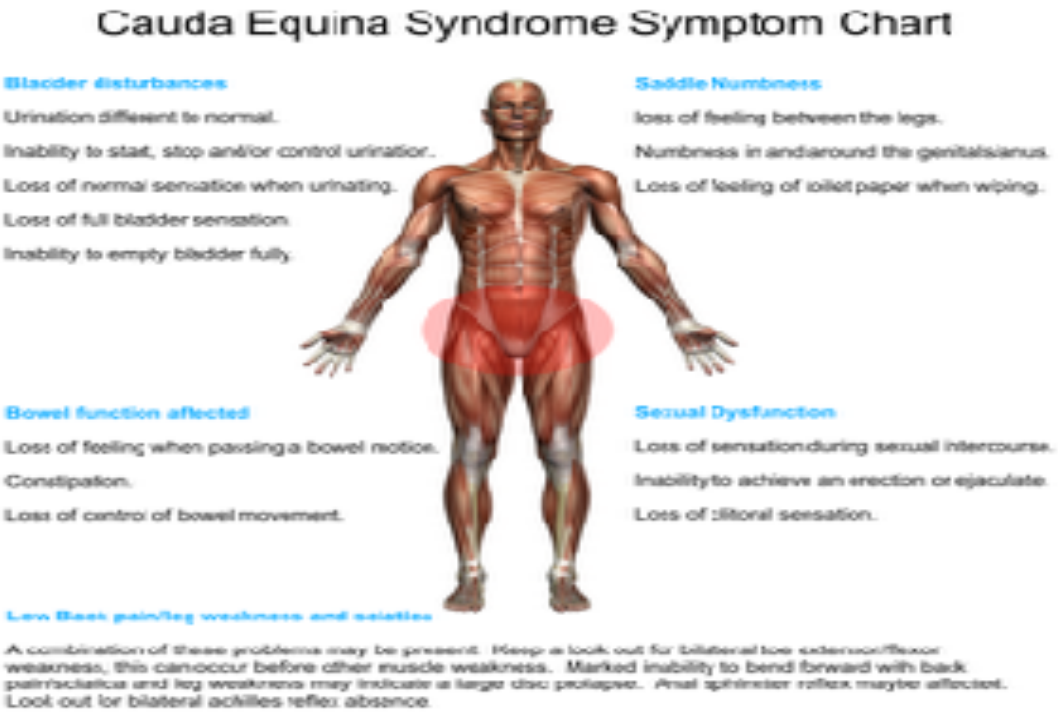


The syndrome is caused by the loss of functions of two or more of the 18 nerve roots constituting the cauda equina (CES) . Symptoms include:

- ●Sensory symptoms
  - Low back pain accompanied by pain radiating into one or both legs. Radicular pain reflects involvement of dorsal nerve roots and may have localizing value.
  - Sensory loss in a dermatomal distribution.
- ●Motor – depends on level of the lesion and which roots are compressed .
- ●Bowel, bladder or sexual dysfunction usually reflect involvement of S3-S5 nerve roots .



Aetiology of Cauda equina syndrome – any compressive lesion. Most commonly related to disc herniation (esp midline herniation). The most commonly affected disk space is L4-5 followed by L5-S1 and L3-4

However it can result from spinal metastases (esp lung , breast and myeloma)(or carcinomatous meningitis), spinal hematoma (consider with coagulopathies, anticoagulation, post trauma/ procedures), epidural abscess (osteomyelitis / discitis) ,or traumatic compression, inflammatory conditions (eg spinal arachnoiditis, chronic inflammatory demyelinating polyneuropathy, and sarcoidosis)

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Pain –The majority of patients (~70%) have a history of chronic back pain. The other 30% of patients present with CES as a primary manifestation of their herniated disc. These patients usually present complaining of resolved or mild back pain secondary to some inciting event. Bilateral symptoms (bilateral radicular pain, sensory disturbances, weakness or reflex changes)may be suggestive of large central disc herniation and thus at risk of CES.
Those with neoplastic diseass often c/o pain which is often worse with recumbency and at night (? epidural venous distension ? diurnal variation in endogenous steroids.

Other complaints include bilateral sciatica, radicular symptoms, gait disturbances, frequent falling, insensate buttocks and/or feet, urinary or faecal retention / incontinence, or even paralysis. Difficulty passing urine may results from causes other than CES in particular pain or medication side effects.

On examination, combined motor and sensory deficits are hallmark physical findings and usually include bilateral leg weakness, positive SLR, decreased deep tendon reflexes, saddle anaesthesia, decreased or absent sphincter tone and bowel/bladder retention or incontinence.

The three key assessments are:
-Rectal examination to assess perineal sensation and anal sphincter tone.
- A post-void residual should be obtained. If there is greater than 100 to 200 mL of residual urine, then urinary retention is likely present, unless there is a history of other obstructive problems eg prostatism. Small et al notes that urinary retention has a sensitivity of 90% and a specificity of about 95% for the diagnosis of CES in those patients with the appropriate history and physical examination. If urinary incontinence is present, it is secondary to overflow incontinence from underlying acute urinary retention. In addition, anal sphincter tone is diminished in up to 80% of patients.
- A straight leg raise should be attempted to further evaluate for suspected radicular symptoms

One source of complexity with these cases is that lesions may partially compress some nerve roots or and not all. As a result ~ 40% (range 30-50%) of CES are classified as incomplete where there is perianal/saddle paraesthesia but urinary retention/incontinence has not fully developed (loss of urgency or decreased sensation may be present).

Investigations:

- The EMDOCS site point out a number of studies evaluated multiple symptoms and signs that are associated with CES. They conclude that "**No symptom or sign has been demonstrated (to have) high specificity or sensitivity"** in terms of identifying CES on MRI.
- Thus if MRI should be obtained if one suspects CES.
- CT myelography can be obtained as an alternative if there are contraindications to MRI.
- Note especially if malignant disease is suspected, the MRI should include the entire spine, as it is possible to have higher spinal lesions causing similar symptoms that would be missed on a focused MRI. Diagnosis of these lesions is important for treatment planning.

Timing? Historically early decompression was advocated as this was thought to improve outcomes. However more recent studies have found that outcomes vary and are based more on the severity of symptoms at presentation. Nevertheless from an ED perspective refer and image as soon as feasible.

ED treatment? Early diagnosis and referral for definitive management are the key ED steps Early referral for decompressive surgery with excision / drainage of the inciting pathology. Other adjunctive agents may be considered depending on the likely aetiology- steroids may be considered for discogenic Dx or neoplastic Dx- antibiotics for abscesses- reversal agents for haematomas – radiotherapy for neoplasia.

Medicolegal perspectives? EMDocs point out that lawsuits are more common when there is a delay > 48hrs to surgery, when there is a failure to document an appropriate history and exam (including PR and perianal sensation) , failure to provide strict return advice / education and when there is a failure to refer. Ie a diagnosis not being considered leading to delay to Ix leading to delay to Tx.

TAKE HOME POINTS – Keep a high level of suspicion and do a full exam including PR and perianal sensation when you have any symptoms suggestive of CES. However remember that no symptoms or signs cannot rule it out and patients need to be referred for an early MRI if outcomes are to be optimised

Editor: Peter Wyllie

Refs- Uptodate – Small SA et al, Orthopedic pitfalls: cauda equina syndrome, *Am J Emerg Med* 2004 22(4):887–908 - EMDocs http://www.emdocs.net/cauda-equina-syndrome/ Todd NV An algorithm for suspected cauda equina syndrome

CONCUSSION ADVICE

A 15yo boy presents after mistiming a tackle at rugby with a brief LOC followed by a mild headache. The parents ask when he can he next play. What advice to you give?

The MJA recently published a position statement summary from the Australasian Institute for Sport + AMA for the management of concussion.

Once the patient has presented to the ED, our assessment initially focuses on who should be scanned and who should be admitted. In the majority of sport related concussions patients are not scanned and discharged home, so one major issue is what post discharge advice they are given.

The MJA recommends..

- Once a diagnosis has been confirmed, the main treatment for concussion is rest. When symptoms have resolved for a minimum of 24 hours (longer for children) gradual return to sport can usually begin.

- The activity phase should proceed as outlined in the algorithms below with a minimum of 24 hours spent at each level. The activity should only be upgraded if symptoms have not recurred during that time. If this occurs, there should be a step down to the previous level for at least 24 hours (after symptoms have resolved):

    - begin with light aerobic activity at an intensity that can easily be maintained while having a conversation
    - basic sport-specific drills which are non-contact and with no head impact
    - more complex sport-specific drills without contact; may add resistance training
    - full contact practice following medical review
    - normal competitive sporting activity.

- Children and adolescents take longer to recover from concussion. They should have a longer rest period (48 hours) and the recommended minimum of 14 days from when symptoms cease before returning to full contact sport (after medical clearance).

- If in doubt, sit them out.

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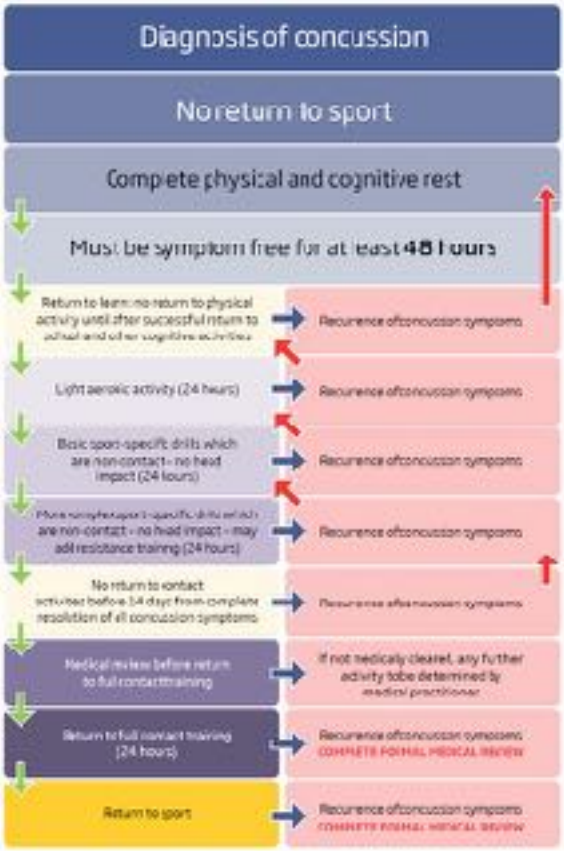

< 18yo (note 14 day till return to contact sports)

> 18yo

Ref: Lisa J Elkington and David C Hughes, Australian Institute of Sport and Australian Medical Association position statement on concussion in sport *Med J Aust* 2017; 206 (1): 46-50

NEXT WEEK'S CASE

3yo boy presents with malodorous ulcerated scalp lesion which has progressed despite 5 days of oral cephalexin. On exam – afebrile – raised ~ 10X 8 cm area of friable, ulceration skin. The hair over the lesion fell out with a gentle clean with saline What is going on?

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JOKE / QUOTE OF THE WEEK

Please forward any funny and litigious quotes you may hear on the floor (happy to publish names if you want)

THE WEEK AHEAD
Tuesdays - 14:30 – 15:30 Intern & JMO teaching -Thomas & Rachel Moore
Wednesday- 0800-0900 Critical Care Journal Club. ICU Conf Room / 14:30 – 15:30 Intern & JMO teaching -Thomas & Rachel Moore
Thursday 0730-0800 Trauma Audit. Education Centre / 0800-0830 MET Review Education centre / 1300-1400 Medical Grand Rounds. Auditorium.

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