Assessment of Potential Red Flag Conditions

* Which conditions should we be mindful of?

- * CES
- * Spinal infections
- * Spinal Fractures
- * Malignancy



Spinal Infections Background

- * Defined as infection involving vertebral body, IV disc and paraspinal tissue (Nickerson et al 2016)
- * Represent 2-7% of all MSK infections (Lener et al 2018)
- * Bimodal allocation <20yrs and 50-70yrs (Krogsgaard et al 1998)
- * Gender ratio m:f 2:1 5:1 (Grammatico 2008)
- Incidence 1:20,000 1:100,000 Mortality 2 20% developed countries (Lener 2018)
- * Low specificity of signs = delay in diagnosis

Spinal Infections Symptoms

- * Tend to be unspecific, therefore challenging
- * Back pain (85%)
- * Fever (48%)
- * Paresis (32%) (Duarte 2013)

Spinal Infections Pathophysiology

- * Either haematogenous from distant site, dissemination from adjacent tissue or direct external source
- * In adults discitis most commonly from endplates which are necrotised by septic embolus (Ratcliffe 1985)
- * Pyogenic spondylosdiscitis affects Lsp (58%), Thsp (30%) and Csp (11%)
- * TB mainly affects Thsp and often >2 levels
- * Spread from adjacent tissue rare but retropharyngeal abscess, oesopheal rupture and infected implants likely cause
- * Most direct external infection is iatrogenic (infiltration or surgery)

Spinal Infections Risk Factors

- * Advanced age
- * Obesity
- * TB endemic country
- * Substance abuse, smoking, alcohol
- * Chronic infection (especially HIV)
- * Long term steroid use
- * Poor nutritional status
- * Immunologic incompetence (DM, RA, HIV, cancer)
- * Spine surgery

Spinal Infections Diagnosis

- * Tend to be unspecific, with insidious onset
- Back pain (85%)
- * Fever (48%)
- * Paresis (32%) (Duarte 2013)
- * Pain exacerbated on dorsal flexion
- * 30-70% of patients with SpDiscitis have no signs of prior infection
- * Delay in diagnosis often means poor outcomes
- Diagnosis always supported by laboratory, clinical and imaging findings (Butler et al 2006)
- * CRP and ESR most useful blood tests, MRI most reliable imaging technique

Spinal Fractures

- * Result from biomechanical failure of the bone
- * Caused by underlying disease or trauma (or both!)
- * VC divided into 3 columns for the purposes of classification
 - * Anterior ALL, anterior half of VB and disc
 - * Middle posterior half of VB disc, and PLL
 - * Posterior FJ, LF and posterior elements and ligaments



Fractures Classification

- Wedge fracture compression # to anterior column resulting wedge shape deformity to VB
- * Burst VB is crushed in all directions, potentially projecting bone fragments into canal
- * Dislocation causes one part of the column separates from another, due to compressive, rotational and tension loads
- * Seat belt (Chance) due to forced flexion over seat belt
- * Would expect latter 3 to attend ED due to MOI

Fractures Classification

* Wedge



Burst #



Dislocation





Chance #

Fractures Classification

* Stable vs unstable

- * Stable # generally only involve anterior column (wedge)
- * If ant and middle column is involved (burst) more unstable
- * If all 3 columns are involved (dislocation/Chance) unstable due to loss of integrity of stabilising ligaments

Compression Fractures

- Occur secondary to axial/compressive load leading to biomechanical failure
- * Commonly associated with osteoporosis
- * Not unusual for osteoporosis diagnosis to follow #
 - * 20% of women have had 3 # before being diagnosed with osteoporosis
 - * 30% white women (aged 50-70) are osteoporotic
 - * By age 80, 70% are osteoporotic

Compression Fractures

- * Can result in younger age with high energy mechanisms
- * Most commonly affects low Thsp to Upper Lsp due to ligamentous and anatomical arrangements (T8-L2)
- * Can lead to kyphotic deformity, which can lead to progressive deformity due to loss of sagittal balance

Compression Fractures Epidemiology

- * 25% of women >50yoa have at least one VCF (ThLjx involved in 60-75%)
- * In younger people, 50% result from MVCs, 25% from falls
- Older patients 30% occur in bed (Savage et al 2014)
- * Coughing, sneezing, mobilising into chair or bath in severe osteoporosis
- * Osteoporotic # often caused by lifting, bending or falling from standing height
- * Differentials myeloma, metastatic, infection
- * Many high energy fractures will have associated injuries

Compression Fractures Risk factors

- * Gender (f>m)
- * Age (>65yo)
- * Malabsorption syndromes (Inflamm, Bowel disease, coeliac)
- * Endocrine issues (eg. Hyperparathyroidism)
- * Steroid use
- * Alcohol (3 or > units/day for women)
- * Smoking
- * Hx of tumour/malignancy

Compression Fractures

- * Pain usually improves after 6 weeks, becomes more chronic ache
- * Can last for several months, well after # has healed
- * Generally managed conservatively
- * Pain medication and osteoporosis meds if not already Px
- * Orthosis and bracing
- * Vertebroplasty and kyphoplasty (when pain = hospital and immobility)
- * Younger patients with unstable # stabilisation surgery
- * Risks vs benefits

Spinal Metastases

- * Bone is third most common site of mets after liver and lung (NICE 2014)
- * 30% of these patients will develop mets
- * MSCC seen in 3-5% of cancer patients (Robson 2014)
- In 20% of MSCC cases, cord compression may be the first sign of malignancy
- * Most common primaries to metastasise to spine are breast, lung, prostate, thyroid and kidney
- * Spread via arterial route (vertebro-venous plexus) or direct invasion
- * Don't assume lack of Ca hx means no risk
- * Consider myeloma

Spinal Metastases Symptoms

- Increasing back pain (new, different, more severe (8/10)) with
 'disproportionate' levels of distress
- * Can be localised or generalised depending on site and structures involved
- * Pain radiating like band around chest, multilevel involvement
- * Often worse when lying down, sleep very disturbed
- * Symptoms can wax and wane (don't be reassured by this)
- * Exacerbated by coughing and sneezing
- * May include radicular symptoms +/- sensori-motoro deficit
- * Limb weakness
- * Patients with hx of cancer should significantly increase index of suspicion

Spinal Metastases What if....

- * Immediate referral to GP if no longer under the care of hospital
- * Urgent contact with MSCC nurse if still under hospital

- * MRI gold standard
- * X-ray commonly used but poor test that only reveals advanced disease with vertebral collapse
- * CT help with pre-op planning

Spinal Metastases Treatment

- MDT approach with spine surgeon, oncologist and radiologist as well as palliative care team
- * Not curative but to gain pain control and preserve function and QOL

Conclusions

- * Serious pathology is rare
- * Early identification and referral is crucial for best outcomes
- Clinical reasoning and context is crucial for recognising potential pathology
- * Have to accept challenges of managing uncertainty