DJD - General

Can be:

Primary	No specific cause can be identified
Secondary	Trauma/infection/developmental anomaly

Poor correlations between radiographic findings and symptoms

Target sites

Weight bearing joints

AC Joints

1st CMC

DIPs and PIPs

1st MTP

In Lx, common in L4/L5, L3/L4

S&S

Moderate, achy pain	Stiffness
Occasional swelling	Crepitus
Reduced ROM	Normal Bloodwork
+ve Spurlings, Shoulder abduction , +ve cervical distraction	Aggravated by extension, ipsilateral lateral flexion
Consider myelopathy	

DDD - Findings

Decreased disc height (puts extra pressure on facet joints due to lack of impact absorption)

Osteophyte formation

Endplate sclerosis

Vacuum phenomenon

Subluxation

Subchrondal cysts

Consider MRI if conservative care does not improve symptoms after 3-6 weeks

Annulus disease: - disc height remains the same - weakened Annulus pulls on VB - osteophyte formation
Vacuum phenomenon: Area of nitrogen gas in annular fibres when injured
- Microtrauma in annulus = annular tears, seperation of annulus from vb endpplate

Presentation

- Radioculopathy/Encroachment due to posterior osteophytes, facet and uncovertebral joint arthrosis, thickened bulging ligamentum flavum and a decreased in disc height

- Age (>50 yo)

- Flexion of the neck relieves arm pain

- Not trauma related

- X-ray Changes

- pain relieved by rest, aggravated by activity

- Muscle hypertonicity locally

- Tender over the involve segment

- Pain may refer over butt/hip/thigh

- Reduced ROM

- Gradual stiffness and loss of ROM

- Pain with ipsilateral LF / Ext

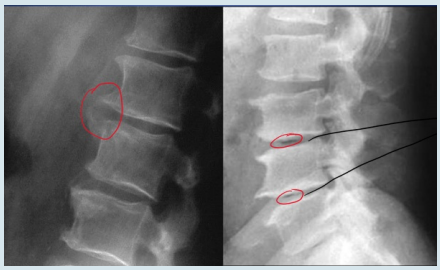
- +ve Kemps, +ve Yeomans +ve SLR +ve Braggards +ve Slump

- +ve Valsalva

- Assess for: Foot hyperpronation
Breathing
LCS
Hip abductor weakness

- SMR changes - MYELOPATHY (UMNL - Clonus, Babinski, Hoffman, L'hermittes, Increased reflexes, Stiffness on gait/posture)

DDD on X-ray



Osteophyte formation on the left image
Vacuum phenomenon circled on the right image

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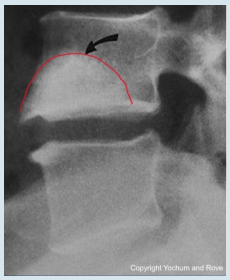
DDD DDX

Cx
Disc lesion
SOL
Tumour
TOS
Inflammatory arthropathy
Rotator Cuff pathology
Heroes Zoster
Peripheral nerve entrapment syndrome
CRPS
Lx
Disc lesion
Strain/sprain
Stenosis
DISH
Fibromyalgia
Hip OA
Spondylolisthesis
F#/Compression f#
Infection
Neoplasm
RA/Rheumatologicadisease
Viscerosomatic referral - AA, GI, GU

Hemispheric Spondylosclerosis



A semicircle shaped sclerosis at the endplate on the vertebral body - **can be similar to blastic mets**
However, blastic mets are more likely to occur in the middle of the vertebral body and would be irregular

Red Flags

- Hx of trauma
- Corticosteroid use
- Osteoporosis
- Prior hx of cancer
- Unexplained weight loss
- Fever
- Chills
- Recent infection/surgery
- S&S of CES/myelopathy

DDD Management

US
Electrical stimulation
Traction for radiculopathy
Myofascial release of CX and shoulder girdle
CX and TX mobilisation/SMT (can be contraindicated by centtral /lateral recess stenosis
Mckenzies in direction of centralisation
Nerve mobilisation (gentle and slow)
Home exercises for: LS, Traps, cervical rotators
Cervical support pillow
Avoid prolonged cervical extension , rotation, lateral flexion and axial loading , reading posture
Big Three exercises
Postural advice/breathing exercises
Referral to specialist - if fails to show improvement, persistent motor weakness, progressive neuro deficit or myelopathy

Phases of disc degeneration

Phase I	Phase II	Phase III
- Dysfunctional phase	- Unstable Phase	- Stabilisation

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Phases of disc degeneration (cont)

- Tears on the outer annulus by repetitive microtrauma	- Loss of mechanial integrity of the tri-joint complex	- Further disc resorption, disc space narrowing, disc fibrosis
- Interrupts blood supply to disc	- In Disc, multiple annular tears occurs, Internal disc disruption, resorption/loss of disc space height	- Endplate destruction
- Impairs nutrit-ional supply and waste removal	- In zygapophyseals - cartilage degeneration, capsular laxity, subluxation	- Osteophyte formation
	Biomechanical - segmental instability	- More likely to have discogenic pain

Modic Changes

Type 1:	Marrow oedema - pain generator - Converts to Type II
Type 2:	Occurs within 3-6 mths to 1 year. Fatty degeneration of subchondral marrow - chronic
Type 3:	Rare - extensive bony sclerosis
Causes	Local instability + inflammation, biomechanical changes to DDD
	Genetics

Type 1 Hyposignal on T1, Hypersignal on T2
Type 2 Hypersignal on both
Type 3 Hyposignal on both

Potential sites of impingement

Central disc herniation/posterior osteophyte	Lateral disc herniation/uncinate hypertrophy
Facet Hypertrophy	Thickening of the Ligamentum Flavum

Management

X-Ray/MRI for further investigations
- Mobilisation
- PIR into the direction that does not cause peripheralisation
- Nerve Mobilisation - flossing & Tensioning
- Ice
- NSAID
- Anti- inflammatory nutritional advice
- Trp therapy
- Stabilisation exercises (if cervical)
- Sensorimotor Training
- Aerobic Exercise and Weight Training
- Graded Exposure for fear and pain provoking activities

Stenosis

Locations	Spinal stenosis, Central canal
	Foraminal
	Lateral Recess Stenosis
Measur-ements	Normal = >15mm
	Stenosis = 13mm
	Definite Narrowing = <10mm
Causes	Posterior Bulges, herniations, osteophytes, ligamentum flavum

MRI

Grade 1: loss of <50% of subarachnoid space without cord deformity
Grade 2: Denotes spinal cord deformity without signal change
Grade 3: Spinal cord signal change at site of compression
- MRI rules out non-degenerative causes of stenosis - tumour, syrinx, MND, MS

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Stenosis (cont)

CT myelography: Differentiation of osseous and SOL

MRI/ CT Axial Gold Standard
Mainly affects the L5 NR

Types of Stenosis

- Congenital (short pedicles/small canal diameter)
- **Acquired:** Trauma, Disc Lesion, Spondy, Tumour, Bone disease, Abscess, Hematoma, Arthritis

Symptoms

Insidious Onset >50y	LBP, numbness, tingling, radicular pain
Bilateral leg + low back symptoms - relieved by bending forward + sitting	Worse with extension, walking downhill + standing for long periods

Chronic compression on the spinal cord - loss of fine motor skills of the hand, lower extremity pain, paresthesia, numbness, weakness, gait and balance disturbances, difficulty walking, loss of bowel/-bladder control

Face not usually affected

If presence of fasciculations, atrophy, signs of denervation - consider ALS

Trefoil Canal A triangular shape on MRI due to the narrowing of the canal

Clinical Findings

- Decreased Cx ROM (extension can induce symptoms)
- +ve L'hermittes, +ve Spurlings, +ve Cx distraction +ve Valsalva if central cord
- Mix of LMNL + UMNL signs (myelopathy)
- UL and LL SMR should be done (long tract signs)
- +ve Kemps (anything that requires extension)
- +ve SLR (if foraminal/lateral recess stenosis)
- **Assess for vascular claudication:** 5 Ps : Pulsenessless, paralysis, paresthesia, palor and pain
Pt report symptoms - provoked by walking, relieved by standing

DDx

- ALS, MS (younger patient), PLS (cranial nerve involvement)
- Vitamin B12 deficiency
- Tumour
- Abscess
- Neoplasm
- Syringomyelia
- Arnold-Chiari
- Vascular disease
- Cord infarction
- Radiation myelopathy
- Encephalitis
- Drug use
- DDD/DJD
- Mechanical LBP
- Myofascial pain
- F#
- Hip pathology
- Rheumatological disease

Management

- No myelopathy or significant NR involvement, conservative care is considered
- SMT/mobilisation (if more than moderate degenerative changes)
- Nerve mobilisation (home exercises) and cervical traction (reduce nerve adherance, facilitate nerve gliding, reduce intaneural swelling and improve axoplasmic flow)
- Heat, massage, US, electrical stimulation
- Stretching, STW of cervical and shoulder girdle musculature
- Cx strengthening
- **Surgical referral if:**
- Rapid deterioration
- Significant disability
- >3mm instability on flex/ext views
- Abnormal findings on neurodiagnostic testing

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Management (cont)

- Significant concave cord deformity

Criteria for successful management :
Lower initial VAS and disability score
Younger age
Radicular symptoms described as pain rather than paresthesia/weakness
Higher BMI

Cervical Myelopathy

Weakness, stiffness/clumsiness in the hands

Urinary urgency - bladder + bowel incontinence in late stages

Clinical S&S

Clonus

+ve L'Hermitte's

UMNL signs below lesion

LMNL at level of compression

Loss of vibration and joint position sense - Hands more than feet

+ve Babinskis + Hoffmans

Hyperreflexia in the legs, gait changes, difficulty with tasks that require dexterity/fine movement

Weakness in the legs, difficulty walking (spastic gait)

- If presence of fasciculations, atrophy/denervation - ALS should be considered

Management

- MRI - Check for Tumours, Central Disc Herniations, Atlanto-axial subluxation (in neck)

- Usually caused by cx spondylosis

- Immediate Neurosurgical evaluation

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