

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

Subchondral 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, separation of annulus from vb endplate

Presentation

- Radiiculopathy/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

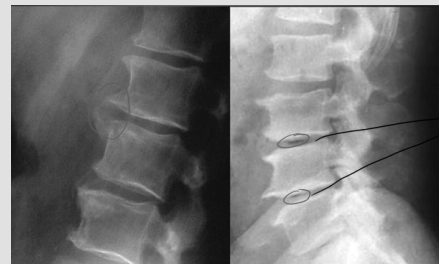
Breathing

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



DDD DDX

Cx

Disc lesion

SOL

Tumour

TOS

Inflammatory arthropathy

Rotator Cuff pathology

Herpes Zoster

Peripheral nerve entrapment syndrome

CRPS

Lx

Disc lesion

Strain/sprain

Stenosis

DISH

Fibromyalgia

Hip OA

Spondylolisthesis

F#/Compression f#

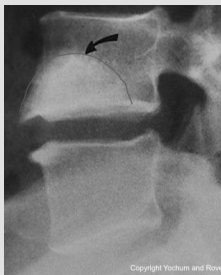
Infection

Neoplasm

RA/Rheumatologic disease

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 central /lateral recess stenosis)

Mckenzie's 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

Phases of disc degeneration (cont)

| | | |
|--|--|--|
| - Tears on the outer annulus by repetitive microtrauma | - Loss of mechanical 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 nutritional 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

Measurements 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

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 Worse with extension, walking downhill + standing for long periods
- relieved by bending forward + sitting

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 adherence, 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



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

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

- Usually caused by cx spondylosis

- Immediate Neurosurgical evaluation

