Class 9 OAS Notes

Lumbar spine

1. 5 lumbar vertebrae – largest, L5 is the largest, with largest body. Massive processes. Main function – support the weight
2. Connections between lumbar vertebrae – disc in front and two facet joints in the back

AROM

1. Forward flexion is 40-60 degrees (60 degrees or greater)
2. Extension is 20-35 degrees, (25 degrees or greater)
3. Lateral flexion is 15-20 degrees, (25 degrees or greater)
4. Rotation is 3 to 18 degrees

PROM (Very difficult to do)

1. Flexion
2. Extension
3. Lateral flexion
4. Rotation

RIM (Very difficult to do)

1. Flection
2. Extension
3. Lateral flexion
4. Rotation

Myotomes

1. L2 – hip flexion
2. L3 – knee extension
3. L4 – ankle dorsiflexion
4. L5 – great toe extension
5. S1 – plantar ankle flexion
6. S2 – knee flexion

1. **Intervertebral (IV) disc** – connects the bodies and serves and main support and shock absorber. Participates in creating spinal curves.
    a. **Anulus fibrosus** – fibrocartilage ring – Glue

b. **Nucleus pulposus** – gel like ball located inside the ring, made of 85% water – **shock absorber**
c. Name of the discs – C2/C3(first disc), C3/C4 disc, C5/C6 disc etc → L5/S1 disc (last disc)

Activity and increase in disc pressure at L3 level

1. Coughing and sneezing – 5 to 35%
2. Laughing – 40 to 50 %
3. Walking – 15%
4. Side bending 25%
5. Small jumps – 40%
6. Bending forward – 150%
7. Rotation – 20%
8. Lifting 20 kg weight with back straight and knees bent – 70%
9. Lifting 20 kg weight with back bent and knees straight – 170%

Types of disc herniation

1. Protrusion
2. Prolapse
3. Extrusion - the nucleus breaks through the tough fibrous outer layer (annulus fibrosus) but remains within the disc.
4. Sequestration - the gel-like material (nucleus pulposus) breaks through the tough outer layer (annulus fibrosus) and is loose within the spinal canal.

Special tests

1. Quick test – squatting as far as can down on toes. Tests hip, knee, ankle, foot and lower back.
2. Slump test – neuronal tension test. Patient is asked to slump forward. No symptoms go to the next stage flex head and neck, if not symptoms next stage, passively extend the knee, no symptoms go to next step – passive dorsiflexion of the foot. If there is the pain = impingement of dura, spinal cord, nerve roots

A. SLT1 – cervical spine flexion, thoracic and lumbar spine flexion, hip flexion to 90 degrees, knee extension and ankle dorsiflexion. Sciatica nerve
B. SLT2 – cervical spine flexion, thoracic and lumbar flexion, hip flexion to 90 degrees and abduction, knee extension, ankle dorsiflexion – obturator nerve
C. SLT3 – side lying, Cervical Flexion, Thoracic Flexion, Lumbar Flexion, hip flexion 20 degrees, full knee flexion, ankle plantar flexion – femoral nerve

3. Straight leg raise test (Lasegue's sign/test), nerve root issue detection, L5
   a. SLR basic – hip flexion, knee is extended and ankle dorsiflexed – sciatica
   b. SLR 2 – hip flexion, knee is extended, ankle dorsiflexed , foot eversion and toe extension – tibial nerve
   c. SLR3 - hip flexion, knee is extended, ankle dorsiflexed, foot inversion – sural nerve
   d. SLR4 – hip flexion and medial rotation, knee extension, ankle plantar flexion, foot inversion – common peroneal nerve
   e. Pain is at the 35 to 70 degree hip flexion – nerve, if the pain starts to increase after 70 degrees – joint problem
   f. Stress on sacroiliac joint is from 0 to 70 degrees, after 70 degrees stress is on lumbar joints
4. Prone knee bending test – patient is in prone lying position and examiner passively flexed the knee as far as possible. Examine makes sure that hip is not rotating. If knee cannot fully flex, examiner extends the hip with knee flexed as far as possible. Pain in lumbar, gluteal, posterior thigh areas indicates possible L2, L3 nerve root lesion. (Stresses femoral nerve and quadriceps muscle)
5. Valsalva maneuver – seated patient is asked to take a breath and hold, and bear down like when evacuating bowels. Increase of pain indicates intrathecal pressure
6. Brudzinski- Kernig test – meningitis. Flexion of the neck causes knee flexion.
7. Babinski test – upper neuron damage
8. Oppenheim test – examiner slides fingers across the tibia. Produces Babinski reflex

9. Trendelenburg test – a positive test indicated weakness of gluteus medius and gluteus minimus. The patient is asked to stand on one leg for 30 seconds. Patient can hold on to something for balance. In norm pelvis should stay balance. Pelvis drops towards unsupported side = positive test

Lumbar disorders

1. Spondylolysis – bony defect (small fracture) in pars interarticularis. The most common place L5. (Use tuning fork)
2. Spondylolisthesis – slipping forward of the vertebra (Empty feel where spinous process should be)
3. Lumbar disc disorder without radiculopathy
    a. Disruption of the posterior or posteriolateral portion of lumbar disc (Protrusion,Prolapse, E, S). Self-limiting and will clear in about 6 weeks. Unless patient continues with activities.
    b. Onset – sudden, no cause
    c. Usually – recurrent episode
    d. Type of pain – aching pain in the back, with possible radiation to buttocks, more on one side. Sharp pain in the back during movements
    e. Pain is worse in sustained position – sitting, lifting, bending
    f. Inspection (observation) – muscle spasm, flattening of lumbar curve
    g. AROM: limited flexion and produced typical pain
    h. PROM – misleading
    i. RIM: normal
    j. Palpation – tenderness
    k. Special test – negative Slump and SLR test