Connecting chiropractors
Increasing chiropractic market share
Improving education of chiropractors
Cervical Spine: Pearls and Pitfalls
Presenters

• **Dr. Rob Donkin**
  – Functional Anatomy
  – Current research
  – Cervical Radiculopathy

• **Dr. Gert Ferreira**
  – Red flags
  – Case Study
  – Kinesio Taping

• **Chris Neethling**
  – Gonstead adjusting
Functional Anatomy

• Typical vertebrae
Uncinate process

- Saddle appearance of superior surface
- Forms the anteromedial wall of the IVF
- Uncovertebral joints angled orientation contributes to the coupled movements of the cervical spine.
Facet joints

• Rotated at 125 degrees
• This causes rotation and lateral flexion to the same side to happen simultaneously in the primary couple movement pattern of the cervical spine.
• Osteophytes formed on the superior articular process can encroach the IVF
Atypical vertebrae

- Atlas
- Axis
- Seventh cervical vertebrae
Atlas

- Ring shaped with no vertebral body
- Weight of head carried by lateral masses
- Anterior arch: longus colli attaches to the midline
- Posterior arch: no spinous process but posterior tubercle serves as the origin of rectus capitus posterior minor muscle.
Axis

- Atlanto-axial rotation is free because of the lack of an articular process and intervertebral disc
- No IVF
- Spinous process is the superior most attachment for muscles that move the lower cervical spine.
Cervical rib
Cervical rib

• Prevalance 0.7 to 6.2 %
• Relevant in patients with thoracic outlet syndrome
• may attach to the superior portion of the first rib or sternum distally
• Subclavian artery and lower trunk of brachial plexus pass superior to cervical rib and not between the cervical rib and first rib.
• Ligamentous bands may also be present & not seen on x-ray.
Thoracic spine

- Facet joints are more vertical and are slightly rotated so that rotation is favoured over lateral flexion.
- Thoracic discs are very thin relative to the vertebral body height
Muscles of the neck

- Axioscapular muscles: trapezius, levator scapulae, rhomboid major and minor
- Splenius capitus and cervicus used in ipsilateral rotation, lateral flexion and extension.
- Rectus capitus major may have fatty infiltration which can cause chronic pain, soft tissue palpatory findings and poor balance.
- Longus colli and longus capitus are deep neck flexors of the neck
IVF

- Neural structures of occupy almost *half of the space* of the IVF
- Neural contents
  - Ventral and dorsal spinal nerve roots
  - Dorsal root ganglion
  - Spinal nerve
  - Meninges
  - Recurrent meningeal nerve.
IVF borders
Does cervical adjusting work?

• One cervical manipulation = pain relief
• Multiple cervical manipulations = mobilisations
• Manipulation = exercise
• Cervical manipulations > analgesics and NSAIDS.
• Chronic cervicogenic headache
  – spinal manipulations > massage or TENS.
• Thoracic manipulation reduced pain and improved function
  (Cochrane review 2015)
Vertebrobasilar artery insufficiency (VBAI)

- Cervical rotation testing affected contralateral vertebral artery flow but did not produce VBAI symptoms in patients with VBAI
- Use cervical rotation (Wallenberg’s) in absence of better tests. (Mitchell et al. 2005)
Imaging for cervical spine

• The use of imaging for neck pain lacks validity and utility (Haldemann et al. 2008)

• X-rays are useful for ruling out instability but they are non-specific for diagnosing radiculopathy (Childress et al. 2016)

• MRI is not indicated in most cases of CR because of the high rate of false positives and false negatives.

• 57% of patients without CR have degenerative changes and 26% have spinal cord impingement. (Teresi et al. 1987)
Imaging

• MRI is indicated for complex cervical radiculopathy (Bono et al. 2011)
• CT can be helpful when identifying nerve compression when MRI studies are unconclusive.
Research for cervical spine surgery

• The difference in risk and benefits of various surgical techniques are small
• Cervical disc replacement (CDR) showed a higher rate of overall success, greater improvements in pain at long-term follow-up compared with those in the fusion group.
• The rate of adjacent segment disease was less in the CDR group versus the fusion group at 60 months (2.9% vs 4.9%).
• Rates of revision and supplemental fixation surgical procedures were lower in the CDR group. (Mummaneni et al. 2013)
Cervical Radiculopathy

• Acute CR caused by prolapse of nucleus pulposis in young patients
• Subacute CR is most common in patients with cervical spondylosis
• Chronic CR responds poorly to conservative treatment.
Provocative Test Cluster

• Upper limb tension test
• Arm squeeze test
• Spurlings test
• Shoulder abduction test
• Axial distraction
• (Thoomes et al. 2018)
Upper limb tension test

- Use ULTT *first* for screening patients to rule out CR.
- ULTT has high sensitivity to CR (acute or chronic)
- DEMO
Arm squeeze test

• Helps to distinguish between cervical radiculopathy and shoulder pathology in patients with shoulder pain.

• Sensitivity 96%, specificity of 91% has been reported (Gumina et al. 2013)

• DEMO
Spurlings Test

• High specificity 95%, mild to moderate sensitivity (Jones 2018)
• Patient seated. Examiner forward flexes neck and adds lateral flexion.
• Reproduction of symptoms constitutes a positive test.
Shoulder Abduction Test

• The patient in the seated position actively places the palm of the affected extremity on top of the head.
• Positive signs were achieved when this position could relieve radicular pain
• Picture
Axial Distraction Test