Diagnosis of Neck & Upper Extremity Pain

David B. Bumpass, MD
Assistant Professor, Spine Surgery
UAMS Depts. of Orthopaedic Surgery & Neurosurgery
May 12, 2018
Disclosures

- Medtronic Spine – speaking fees
Objectives

1. Identify common causes of neck/upper extremity pain in a general practice population.
3. Review options for initial non-operative management of neck/upper extremity pain, knowing when patients need referral for further specialist evaluation.
DR, MY ARM HURTS..

AMYLOIDOSIS
Differential Diagnosis

• Cervical spine
  – Radiculopathy
  – Myelopathy

• Shoulder
  – Subacromial bursitis
  – Rotator cuff tendonitis
  – Rotator cuff tear
  – Biceps tendonitis
  – Glenohumeral arthritis
  – Acromioclavicular arthritis
  – Adhesive capsulitis
Differential Diagnosis

- **Brachial plexus**
  - Thoracic outlet syndrome
  - Parsonage-Turner syndrome
- **Elbow**
  - Lateral/medial epicondylitis
- **Peripheral nerve entrapment**
  - Carpal tunnel syndrome
  - Cubital tunnel syndrome
Differential Diagnosis

• Neurologic
  – Multiple sclerosis
  – ALS
  – Peripheral neuropathy
Osseous Anatomy

- Uncovertebral joint
- Zygoapophyseal joint

Neural Anatomy

- 8 cervical nerve roots
  - C1 is clinically unimportant
  - C8 emerges at C7-T1 interspace
History

• Location
• Duration
• Exacerbation
• Handedness
• Occupation
Cervical Radiculopathy

- Pain
  - “Burning”
  - “Deep ache”
  - “Tingling”
  - “Excruciating”
  - “Headaches”
    - Occipital, retroauricular
- Often relieved by placing hand on head

Ponnappan et al. JAAOS 2015
Cervical Spine Physical Exam

- Motor exam
  - C5 – biceps
  - C6 – wrist extensors
  - C7 – wrist flexors
  - C8 – finger flexors
  - T1 - interossei
Cervical Spine Physical Exam

• Exam
  – Motor and sensory extremity testing
  – Reflexes
  – Spurling test
  – Romberg test
  – Heel-toe gait
  – Hoffman sign
  – Clonus

CERVICAL MYELOPATHY
Spurling Test

- Narrows foramina on side head tilts towards
Shoulder Physical Exam

Hawkins Test = bursitis/tendonitis

Jobe/”Empty Can” Test = supraspinatus
Shoulder Physical Exam

Lift-Off Test = subscapularis

External Rotation Test = infraspinatus
Workup

• Cervical radiographs
  – AP, lateral views
  – Swimmer’s view if cannot see C7-T1
• Cervical MRI
  – Without contrast unless previous surgery, concern for tumor/infection
• EMG/nerve conduction study
  – “Gold standard” to differentiate cervical radiculopathy vs. peripheral nerve pathology
Cervical MRI

• Non-contrast (except for infection/tumor)
• Evaluate for disk herniation
  – Central canal
  – Foramina
• Myelomalacia
  – Cord signal change, particularly on STIR sequence
Radiographic Findings of Spondylosis

- Disk space narrowing
- Listhesis
- Loss of lordosis
- Anterior body osteophytes
- Uncovertebral narrowing/osteophytes (on AP)
- Foraminal stenosis
- Central stenosis
  - Less than 13mm A-P diameter
Non-Operative Management

• Physical therapy
• NSAIDs
• Injections
  – Central epidural
  – Trans-foraminal
Corticosteroid Injections

- Level II evidence for effectiveness
- But, number of high-quality studies low (only 7 qualifying studies)
- Majority of evidence for use in disk herniation
Operative Indications

- Persistent radicular pain not responsive to conservative management
- Persistent/progressive radicular numbness
- Radicular motor deficit
- Myelopathy
- Myelomalacia on MRI
Anterior Cervical Diskectomy/Fusion (ACDF)

- Gold standard for 1-level or 2-level pathology
- Much less pain and shorter recovery than posterior approach
  - Most common post-op complaint is sore throat for several days
Cost-Effectiveness of Single-Level Anterior Cervical Discectomy and Fusion Five Years After Surgery

Leah Y. Carreon, MD, MSc,* Paul A. Anderson, MD,† Vincent C. Traynelis, MD,‡ Praveen V. Mummaneni, MD,§ and Steven D. Glassman, MD*

- Cost/QALY
  - 1 Year: $105,000
  - 2 Years: $53,000
  - 3 Years: $38,000
  - 4 Years: $28,000
  - 5 Years: $23,000
Cervical Disk Arthroplasty (CDA)

• Indications
  – Radiculopathy caused by disk herniation...
  – **NOT** caused by osteophyte impingement

• Contraindications
  – Rheumatoid arthritis
  – Myelopathy

• **NEED PRE-OP CT SCAN**
CDA Options

Jeon et al JKMA 2011
CDA Outcomes

- CDA had better Neck Disability Index scores and neurologic improvement at 7 years vs. ACDF
- CDA maintained 6-7 degrees of segmental motion
- CDA was superior in terms of subsequent adjacent-level surgery (4.6% vs. 11.9%, p=0.008)
CDA Outcomes

Burkus et al. J Neurosurg Spine 2014
Laminoplasty

• Advantages vs. Fusion
  – Preserves motion
  – No risk of pseudarthrosis
  – Can be utilized for myelopathic smokers
Treatment

• Non-operative
  – Ergonomics
  – Observation
  – Night splints
  – Corticosteroid injection

• Operative
  – Carpal tunnel release
Thank You