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Interdisciplinary Evaluation and Management of Shoulder Pain in Individuals with SCI

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Learning Objectives

At the conclusion of this presentation, the learner will:

1. List common causes of shoulder pain after spinal cord injury
2. Employ history, physical exam, and imaging to make accurate diagnosis of pain generator
3. Prescribe individualized treatment plans based on diagnosis and patient demographics

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Audience Participation

Please utilize the QR coded embedded within the presentations to participate in the case discussions.

Introduction

- Incidence of UE pain post- SCI: 30-70%
  - Shoulder most affected joint
- Shoulder pain
  - Chronic impingement syndrome: 75%
  - Rotator cuff tear: 65%
- Impact of pain: 59% (tetra), 41% (para) -> “significant”
  - Significant = requiring medication, associated with impaired ADLs, cessation of activity
  - Lower QOL, decreased physical activity

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Acute SCI Cases

Case 1

- 35 y/o man with acute paraplegia after MVC; admitted to IPR
- At baseline: works desk job, describes himself as a "couch potato"
- Early in rehab course complains of “shoulder” pain to rehab team
- Exam notable for intact shoulder ROM and strength
  - No impingement signs on testing
  - Pain reproduced with palpation of trapezius and levator scapulae muscles
- No imaging ordered based on exam

Case 1

- Diagnosis: Myofascial pain
- Etiology: Increased muscular use compared to baseline
- Treatments to consider
  - Topical medications (i.e Lidocaine patches at night, diclofenac gel during the day)
  - Modalities with therapies
  - Myofascial release
  - Trigger point injections/dry needling
  - Temporary use of power WC outside of therapies
- Clinical considerations
  - Patients can’t always accurately diagnosis pain generator
    - Beware reports of "shoulder" pain
  - Peri-incisional paraspinal spasm may contribute to myofascial pain
    - more after cervical spine surgery
  - Psychology involvement for kinesiophobia and catastrophizing pain

Case 2

- 25 y/o woman with complete thoracic paraplegia after MVC
- No upper body trauma reported
- Complains of right shoulder pain
  - worse with extreme ROM: (pulling up pants while dressing; WB for transfers)
  - no improvement with topical medications
- Exam: mild joint edema compared to non-affected side, no erythema, negative Hawkins, Neer's positive, pain with active and resisted arm abduction
- X-ray negative for missed fracture

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Poll

Case 2

- Diagnosis: subacromial bursitis
- Etiology: acute overuse compared to baseline
- Treatments to consider
  - Analgesic medications: acetaminophen, NSAIDs (limited use due to recent spine fusion), opiates as a last resort
  - Subacromial bursa injection
  - Modified therapy program
    - Reduce UE strength training
    - Educate on return to strengthening use of BUE (not just dominant arm)
    - Focus on functional activities
- Clinical considerations
  - Could consider point of care ultrasound to aid in diagnosis and/or guidance for injection
  - Initial strengthening program balance with baseline conditioning status to avoid pain and overuse during IPR

Case 3

- 44 yo man with incomplete cervical tetraplegia consistent with central cord syndrome
- Complains of aching bilateral shoulder pain with “numbness and tingling”
- Has had some benefit in sympotms with treatment of at-level neuropathic pain
- Exam notable for 2cm shoulder subluxation on left, 1.5 cm on right
  - + sulcus sign
- No imaging completed at this time

Case 3

- Diagnosis: Shoulder subluxation
- Etiology: Neurologic weakness (weight of arms from SCI) resulting in GH distraction
- Case resolution/treatments considered:
  - Pain persisted despite use of topicals; avoided escalation of opiates
  - Bilateral sublux cuffs were not effective but he responded to taping
  - Giv-mohr slings improved pain during gait activities
  - RN provided education on optimal positioning in bed and in chair
- Clinical considerations:
  - Consider GH joint injection for chronic sublux
  - Where do they sit?

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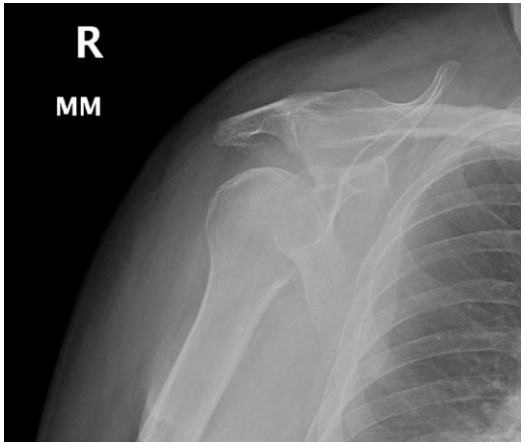
Subacute SCI Cases

Case 4

- 78 yo man with tetraplegia after a fall
  - Did well with IPR and discharged home to care of wife
- Presented to clinic with progressive severe bilateral shoulder pain
  - Reported arm movement was “less” over last few months
  - Wife noted home stretching program was difficult to complete due to all of patient’s care needs
- Exam notable for severe restrictions of active and passive ROM (worse with abduction and external rotation)
- X-ray with joint space mild narrowing



Case 4

- Diagnosis: Adhesive capsulitis
- Etiology: reduced stretching
- Case Resolution/ Treatment considerations:
  - Completed high volume injections in bil shoulder followed by intense outpatient PT
  - Excellent recovery of functional ROM and reduced pain
  - Social work and advocating for assistance to reduce burden of care on family moving forward
- Clinical considerations
  - Spasticity may play an additional role in development of adhesive capsulitis
    - Consider neurotoxin injections if tone contributing to loss of ROM

Case 4

Procedure Considerations:

- Glenohumeral joint hydrodistention injection using ultrasound guidance
- Localization process: With the transducer in an anatomic transverse oblique plane (same plane as the infraspinatus tendon), the posterior glenohumeral joint was localized in a short axis view.
- Local anesthesia: Local anesthesia was obtained with 2 cc of 1% lidocaine
- Needle: A 25-gauge, 1.25-inch needle was used for local anesthesia and the 22-gauge, 3.5 inch needle was used for the injectate
- Approach: A superolateral to inferomedial, in plane, approach was used to guide the needle tip into the posterior glenohumeral joint between the humeral head and the glenoid labrum
- Injection/Aspiration: A mixture of 4 cc of 1% lidocaine, 15 cc of normal saline, and 1 cc of Triamcinolone (40mg/cc) was injected into the right glenohumeral joint

Case 5

- 29 y/o woman with paraplegia due to transverse myelitis
- At baseline very active with work, family, and sports activities
- Completed course of IPR and discharged home
- 6 months after discharge reports new bil shoulder pain
    - Worse with UB dressing (bra), transfer to stand with WW and HKAFOs, reaching for heavy items in cabinets, refrigerator
- History notable for recent return to driving, work, gait training in therapy, and adaptive exercise
- Exam: + Hawkins-Kennedy, + Neer's sign, - edema, TTP at Greater Tuberosity
- No imaging completed
- Diagnosis: shoulder impingement
- Etiology: relative overuse and muscle imbalance

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Case 5

- Treatments considered:
  - oral NSAID, consider injection
  - review outpatient program
    - Strengthening and Optimal Movements for Painful Shoulders
      - Stretching anterior shoulder, adductors, external rotators
      - Strengthening posterior shoulder, rotator cuff and shoulder stabilizers
  - Consider reducing time up for gait training
  - Re-evaluation of current seating system
  - Review ADL and IADL activities to identify opportunities to intervene
- Clinical considerations:
  - WC adjustments
  - Ergonomic considerations- optimize set up for IADLs, work
  - Reduce number of transfers/day

Case 6

- 56 y/o man with C7 complete tetraplegia since his early 20's; uses manual wheelchair
- At baseline completely independent for all care. Active with work, driving, and quad rugby
- Had known chronic left shoulder pain
  - Presented with new weakness with transfers
- On Exam: reduced active abduction, + drop arm test
- Prior to imaging trialed conservative treatment
  - Failed initial trial of relative rest, NSAID, outpatient therapy
  - Failed glenohumeral steroid injection
- MRI consistent with rotator cuff tear

Case 6

- Diagnosis: rotator cuff tear
- Etiology: chronic overuse and impingement
- Case Resolution/ Treatments considered
  - Given functional limitations, decision made to have surgical repair
- Post-operatively required admission to IPR due to NWB status and new uncontrolled AD
  - Sling and NWB status limited transfers
  - Needed assistance for ADLs
  - Temporary foley placement
  - Temporary use of power WC
  - Neuropsych support due to drastic change in functional status
- Clinical considerations:
  - May require post-op SNF during NWB recovery period
  - Slow transition to MWC and education about set up and technique

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Chronic SCI Cases

Case 7

- 52 yo female with C6-C7 level tetraplegia x 9 years
- At baseline Indep with all care except B/B management
  - has care attendant 3 days/week for bowel program
- Presented for outpatient eval with new onset generalized shoulder and R pain
  - Associated R arm numbness/tingling
- On exam:
  - Notable scapular winging on visual inspection
  - R arm weakness apparent with transfers and on MMT
- Imaging/ Diagnostic eval
  - MRI cervical spine (not shoulder) and EMG LUE ordered based on clinical suspicion

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POLL

Case 7

- Diagnosis: C5 radiculopathy
- Etiology: adjacent level disease
- Case resolution/ treatment considerations
  - Confirmed diagnosis with MRI (right C4-5 HNP) and EMG
  - Conservatively managed with oral steroids, time, OP PT
  - No urgent surgical intervention required but scheduled neurosurgical follow-up to follow over time
- Clinical considerations
  - In the absence of pre-existing post-trauma MRI, the finding of a new syrinx may cloud diagnostic picture
  - Best to have EMG completed by someone with higher volume of patients with SCI

Case 8

- 24 y/o female with C7 AIS B tetraplegia 14 years ago
- Presented with unilateral "aching" shoulder and generalized arm pain
  - Worse with sitting and WC propulsion
  - Associated with numbness and tingling
- On exam:
  - Mild weakness at elbow and wrist on MMT
  - Inspection notable for postural deformity and chronic muscle imbalance
- Initial decision to manage with NSAIDs
- Referred for MRI and EMG
- Prior to completing testing she was incidentally scheduled for seating clinic to "consider alternative WC options due to pain"
  - Specifically, to consider power add-on

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Case 8

- Diagnosis: pseudo thoracic outlet syndrome
- Etiology: poor positioning in manual wheelchair
- Case resolution/ Treatment considerations
  - Acutely – stronger pain medications
  - Ultimately- corrected positioning with seating overhaul
    - Custom molded cushion and backrest
    - Decreased seat slope
    - Improved access to wheel
  - Short Outpatient OT course to assess/improve ADLs after chair overhaul
  - Pain resolved
- Clinical considerations:
  - Differentiate patient age from duration since injury
  - Periodic seating evaluation for prevention of postural deterioration

Seated Posture

https://hub.permobil.com/wheelchair-seating-positioning-guide

Case 9

- 70 y/o man with paraplegia since age 18
- Independent with all care; drives sedan; uses manual WC with power add-on PRN
- Adaptive sport athlete turned coach; very active and adherent to HEP
- Presents with chronic progressive bil shoulder pain
  - "just deals with it" despite pain with transfers
- Exam with pain on AROM/PROM
- Imaging: X-rays with joint space narrowing

Case 9

- Diagnosis: chronic osteoarthritis
- Etiology: chronic overuse
- Case Resolution/ Treatment considerations
  - Pain managed with chronic opiates and steroid injections at regular intervals
  - Patient declined surgical intervention (bil TSA offered by ortho)
  - Ultimately decided to transition to power WC
- Clinical Considerations:
  - Psychology support for chronic decline in function
  - TAI for transfer assessment and education
  - Vehicle options and limiting transfers
  - Transition MWC + power assist to PWC

References & Recommended Reading

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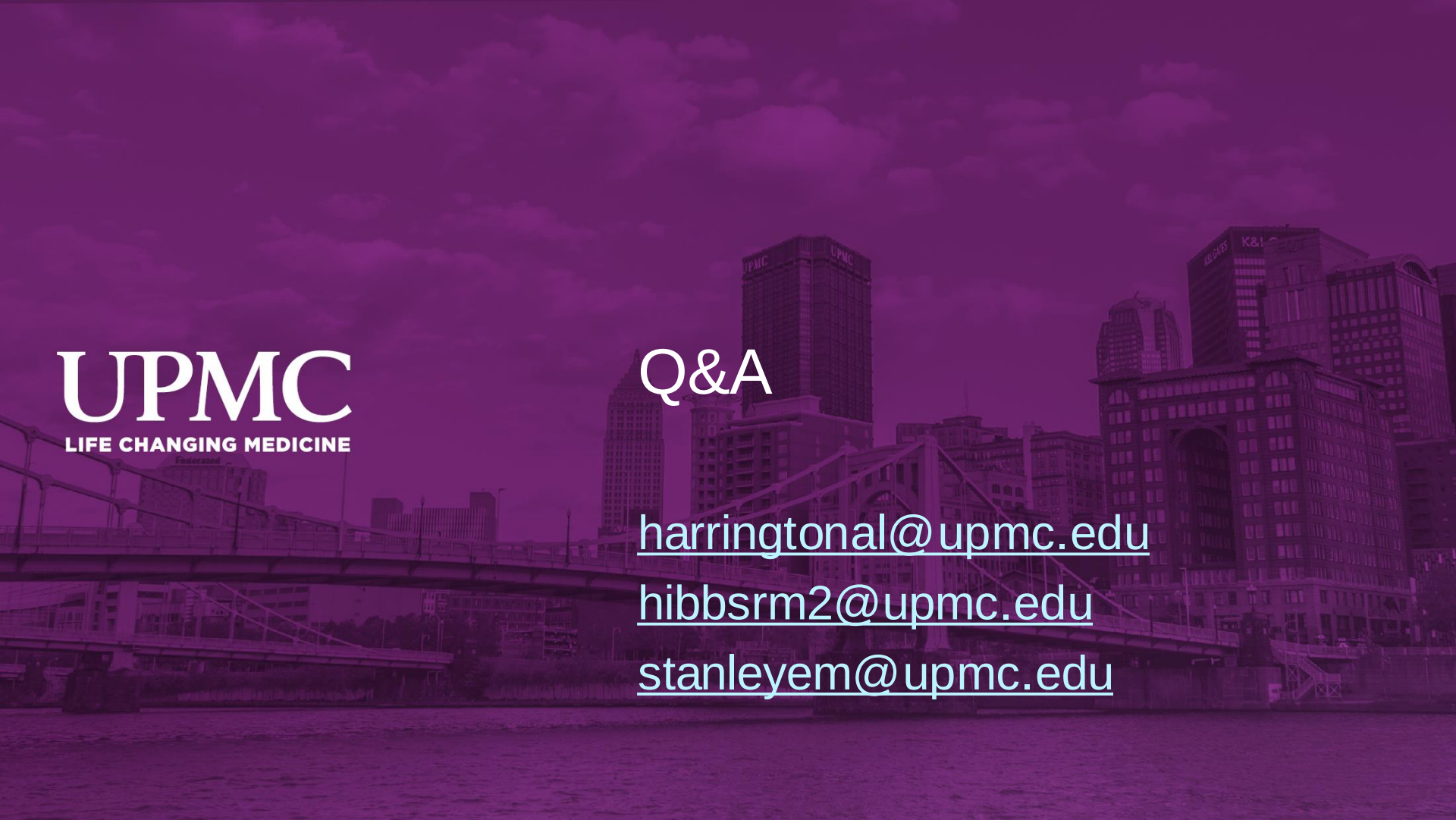

Q&A

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