DO I EVALUATE THE SHOULDER OR THE NECK

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CHATHAM ORTHOPAEDICS

DISCLOSURES

• EDUCATIONAL CONSULTANT
  + FERRING PHARMACEUTICALS
  + SANOVAS MEDICAL
• I HAVE NO FINANCIAL RELATIONSHIPS OR SUPPORT RELEVANT TO THIS TAKE TO REPORT.
• I HAVE NO POTENTIAL CONFLICTS OF INTERESTS RELATING TO THIS LECTURE.

• PAIN FELT IN THE SHOULDER AREA IS OFTEN RADICULAR SYMPTOMS COMING FROM THE NECK.
• THE NERVES AND MUSCLES THAT ARISE FROM THE C-SPINE PASS THROUGH THE SHOULDER ON THEIR WAY DOWN THE ARM.
• THE C-SPINE NERVE ROOTS ALSO TRAVEL DOWN THE ARM VIA THE BRACHIAL PLEXUS.
• CERVICAL SPINE AND ROTATOR CUFF PATHOLOGY OFTEN PRESENT VERY SIMILAR IN CLINICAL PRESENTATION.

THIS LECTURE WILL FOCUS ON:

• EVALUATION OF BOTH THE CERVICAL SPINE AND THE SHOULDER.
• DIFFERENTIATING SYMPTOMS ORIGINATING FROM THE C-SPINE AS OPPOSED TO THE SHOULDER.
• TECHNIQUES IN DIAGNOSING SHOULDER AND C-SPINE INJURIES.
LETS UNDERSTAND THE PATIENT

• IMPORTANT TO ASK A LOT OF QUESTIONS ABOUT THE MOI
• UNDERSTAND PATIENTS CHIEF COMPLAINT
• EXAMINE BOTH THE CERVICAL SPINE AND SHOULDER

ROTATOR CUFF

• SUPRASPINATUS
• INFRASPINATUS
• SUBSCAPULARIS
• TERRS MINOR
• ORIGINATE ON THE SCAPULA, AND TOGETHER FORM A SINGLE TENDON UNIT OVER THE HEAD OF THE HUMERUS.

UNDERSTAND PATHOLOGY & MOI

• ROTATOR CUFF PATHOLOGY IS MOST COMMONLY CAUSED BY EXTRINSIC CAUSES.
• TRAUMATIC TEAR FROM A FALL OR ACCIDENT.
• OVERUSE INJURIES FROM REPETITIVE LIFTING, PUSHING, PULLING, OR THROWING.
• BUT CAN HAVE AN UNKNOWN ETIOLOGY.

7 cervical vertebrae
Atlas-Axis
8 cervical nerve roots

The confusing thing about the C spine is the numbering of the nerves.
There are 7 cervical vertebrae but 8 nerves.
Because no one wanted to describe the nerve that exits the base of the skull as C0.
Therefore C8 is the last cervical nerve and it exits below the C7 vertebra.

Nerve root between occiput & C1=C1

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Nerve root between occiput & C1=C1 root
MECHANISM OF INJURY C-SPINE

• The most common mechanisms of cervical spine injury are hyperflexion, hyperextension and compression.

• Cervical nerve roots (C4-6) innervate the rotator cuff muscles.

• Difficult to differentiate because the sensory distribution runs from the base of the neck to the outer edge of the shoulder.

• Any of these nerves can produce pain in the scapula, shoulder, upper/lower arm, and hand.

PATIENT HISTORY

• History of present illness
• Past medical history
• Has this happened before
• When? What were you doing
• What type of treatment? Any success
• Night pain (bursitis, BC)
• Numbness / tingling? Weakness
• Dominant arm? LHD RHD
• Describe MOI
• Describe symptoms

• Keep in mind your patient’s age, gender, race, and physical appearance which may predispose your patient to some conditions.
HISTORY OF PRESENT ILLNESS

CERVICAL SPINE
- WHEN DID SYMPTOMS BEGIN?
- WAS ONSET IMMEDIATE OR GRADUAL?
- IF IMPACT SUCH AS A MVA (WAS IT AT HIGH SPEED)?
- DRIVER OR A PASSENGER?
- WEARING A SEAT BELT OR HELMET?
- WAS THE VEHICLE MOVING WHEN INJURED?
- DID THE PATIENT SEE THE IMPACT COMING (BRACE THEMSELVES)?
- HIT HIS/HER HEAD, WAS THERE LOC.?
- HEADACHES?
- WHAT AGGRAVATES/RELIEVES THE SX.
- COUGHING, SNEEZING, STRAINING, OR VALSALVA?
- UNABLE TO DO OVERHEAD ACTIVITIES?
- DEFORMITY, SWELLING, INSTABILITY?
- RADIATING SYMPTOMS/PARESTHESIA?
- AWAKENS DURING SLEEP?
- WORK, PLAY, HOBBIES?
- HISTORY OF DISLOCATION?
- AGGRAVATING ALLEViating FACTORS?
- LIMITATIONS IN ACTIVITY?
- WHAT CAN YOU DO FOR THEM TODAY?

SHOULDER
- UNABLE TO DO OVERHEAD ACTIVITIES?
- DEFORMITY, SWELLING, INSTABILITY?
- RADIATING SYMPTOMS/PARESTHESIA?
- AWAKENS DURING SLEEP?
- WORK, PLAY, HOBBIES?
- HISTORY OF DISLOCATION?
- AGGRAVATING ALLEViating FACTORS?
- LIMITATIONS IN ACTIVITY?
- WHAT CAN YOU DO FOR THEM TODAY?

HISTORY

- PAIN- HOW, WHAT, WHEN, WHERE?
- MOI?
- RADIATION TO DELTOID?
- ADLS?
- NIGHT PAIN?
- OVERHEAD WEAKNESS?
- STIFFNESS, CATCHING, POPPING?
- THROWS?
- POSTERIOR PAIN DURING FOLLOW-THROUGH (ECCENTRIC)?
- CUFF STRAIN, FATIGUE?
- POSTERIOR PAIN DURING LATE COCKING?
- INTERNAL IMPINGEMENT?

SHOULDER

- THE PATIENT'S AGE AND CHIEF COMPLAINT ARE USED TO DIRECT THE CLINICIAN'S CHOICE OF EXAM TECHNIQUES.
- OFTEN TIMES THE PATIENT'S AGE WILL HELP ESTABLISH A DIFFERENTIAL DIAGNOSIS.
- TYPICALLY PATIENTS UNDER 25 PRESENT WITH ACUTE INJURIES (SHOULDER DISLOCATIONS), INSTABILITY OR AC JOINT INJURIES.
- ADULT PATIENTS UNDER 40 TEND TO PRESENT WITH ROTATOR CUFF IMPINGEMENT, ADHESIVE CAPSULITIS, MILD OSTEOARTHRITIS OF THE AC JOINT.
- PATIENTS OVER 40 TYPICALLY PRESENT WITH ROTATOR CUFF IMPINGEMENT OR TEARS, OSTEOARTHRITIS OF THE AC OR GH JOINTS.

I'VE ALREADY DIAGNOSED MYSELF ON THE WEB BUT I THOUGHT I'D COME IN FOR A SECOND OPINION.
PATIENT HISTORY

- The more thorough the Hx, the more thorough your differential diagnoses and more importantly the less likely you will miss something important.
- Remember you can be gathering your Hx. throughout the entire visit of your patient (during your observation & physical exam)
- Any previous injury to cervical spine, head, or shoulders.
- Any other predisposing conditions which could relate a to cervical spine condition
- Any previous concussions
- Any previous MVA

MY RECENT PATIENT

- Pulling on lawn mower felt a pop in his arm
- No pain
- Hasn't been to MD in 10 years (i'm in great shape)
- History
- Physical exam
- Wife gives more thorough history

REVIEW THOSE SYSTEMS

- Don't forget the review of systems for other potential causes
  - Endocrine
  - Neurological
  - Cardiovascular
  - Pulmonary
  - Gastrointestinal

SOCIAL HISTORY

- Occupation
- Hours work per day
- Increase in hours, carrying load, etc.
- Change in job position (from sales to the computer)
- Sleeping position, type & # of pillows used
- Sports activities, throwing, lifting
- Alcohol/smoking habits
CLINICAL SYMPTOMS

CERVICAL RADICULOPATHY
- REDUCTION IN PAIN WITH ARM ABDUCTION (DECREASES NERVE ROOT TENSION)
- SENSORY CHANGES ALONG A NERVE ROOT DERMATOME.
- SMALL PERCENTAGE OF PATIENTS WILL HAVE WEAKNESS WITHOUT SIGNIFICANT PAIN.

ROTATOR CUFF PATHOLOGY
- PAIN WITH ABDUCTION OF THE ARM
- ATROPHY, THINNING OF THE SHOULDER MUSCLES
- WEAKNESS WITH ARM ROTATION

OBSERVATION

- WHAT ARE WE LOOKING FOR
  - WHAT IS PATIENT’S POSTURE WHEN THEY ENTER ROOM.
  - PATIENTS ARM POSITION (BAKODY’S SIGN) OR AGAINST THEIR ABDOMEN
  - DOES THE PATIENT TURN THEIR HEAD TO TALK TO YOU
  - DOES THE PATIENT APPEAR TO BE SPUNTING THE NECK STRAIGHT
  - DOES THE PATIENT APPEAR TO BE IN ANY RESPIRATORY DISTRESS
    - ALWAYS ADDRESS RESPIRATORY DISTRESS SXS IMMEDIATELY
    - DOES THE PATIENT APPEAR TO BE IN PAIN WHEN HE/SHE SWALLOW'S
    - DOES THE PATIENT OPEN AND CLOSE HAND WHILE TALKING (COULD INDICATE NUMBNESS/ TINGLING IN HAND)
    - WATCH THE WAY THE PATIENT DISROBES TO REVEAL NECK AND SHOULDERS, DO THEY AVOID CERTAIN MOVEMENT
    - IS THERE ANY MUSCULAR ATROPHY IN THE NECK OR SHOULDER MUSCULATURE
    - NOTE: RECALL THAT THE DOMINANT SHOULDER NATURALLY TENDS TO BE A LITTLE LOWER THAN THE OTHER SHOULDER.

OK CAN THEY CAN MOVE THEIR NECK

- ACTIVE ROM & IF NECESSARY PASSIVE ROM
  - CERVICAL FLEX
  - CERVICAL EXT
  - CERVICAL SIDE BENDING
  - CERVICAL ROT LATERAL BENDING
  - COMBINED MOTIONS (CHIN TUCK, SIDE BENDING, ROTATION)
- NOTE QUALITY, RHYTHM, & PAIN
- APPLY OVERPRESSURE, IF NECESSARY

- (THIS IS IN THE OFFICE SETTING NOT IN THE HOSPITAL)
**OBSERVATION**

- The patient's posture should be assessed in the sitting and standing positions.
- Look for the forward head position.
- Look for rounded shoulders.
- Look for protracted or winging scapula.

**PHYSICAL EXAM**

- Inspect bilateral.
- AROM & PROM.
- Strength.
- Impingement signs & test.
- AC tests.
- Labral & biceps tests.
- Scapular rhythm.
- Atrophy.
- Suprascapular nerve entrapment in DDX.
- Impingement (Neer, Hawkins/Kennedy).
- Neurologic.

**SPURLING TEST**

- Patient's neck is extended.
- Head rotated to symptomatic side.
- Axial pressure applied to head.
- Pain/paresthesia radiating from the shoulder to the elbow is positive.

**DISTRACTION TEST**

Should not be done if patient has vertebral instability.

**Detects:** A nerve root compression may exist while the subject sustains normal posture.

**Procedure:** With one hand under the chin and the other hand under the occiput, distract the pt.'s head from trunk.

**Positive sign:** When pt's existing complaints of pain decrease or disappear during distraction.
**Lhermitte’s Sign**

- DETECTS: SPINAL CANAL STENOSIS & RESULTING SPINAL CORD COMPRESSION. ALSO CONSIDER MENINGEAL IRRITATION AND MULTIPLE SCLEROSIS.
- PROCEDURE: PT. SITTING, PASSIVELY FLEXES THE HEAD FORWARD SO THE CHIN APPROACHES THE CHEST.
- POSITIVE SIGN: PT. COMPLAINS OF PAIN OR PARESTHESIA’S DOWN THE SPINE. PT. MAY ALSO COMPLAIN OF RADIATING PAIN INTO THE UPPER OR LOWER EXTREMITIES.

**Hoffmann’s Sign**

- PATHOLOGICAL REFLEX OF THE UPPER EXTREMITY EQUIVALENT TO THE BABINSKI TEST OF THE FOOT.
- DETECTS: UPPER MOTOR NEURON LESION.
- POSITIVE SIGN: INDUCED FLEXION OF THUMB & OTHER FINGERS OF SAME HAND.

**Empty Can Supraspinatus**

- ARM IN 90° ABDUCTION, 30° FORWARD FLEXION AND INTERNAL ROTATION (THUMBS DOWN)
- PUSH DOWN AS PATIENT RESISTS
- FULL CAN: THUMB UP TECHNIQUE IS EVEN MORE SPECIFIC. PAIN IS COMMON IN A PATIENT WITH ROTATOR CUFF TENDONITIS OR IMPINGEMENT; WEAKNESS IS INTERPRETED AS POSITIVE, THE TEST IS 75% ACCURATE FOR A SUPRASPINATUS TEAR.
HAWKINS TEST
- Indicative of impingement between the greater tuberosity of the humerus against the coraco-humeral ligament, trapping all those structures which intervene.
- It has been reported as less reliable than the Neer impingement test.

NEER IMPINGEMENT
- DEPRESS THE SCAPULA WHILE ELEVATING THE OTHER ARM.
- THIS COMPRESSES THE GREATER TUBEROSITY AGAINST THE ANTERIOR ACROMION AND ELICITS PAIN IN PATIENT WITH IMPINGEMENT SYNDROME OR ROTATOR CUFF TEARS.
- REPRODUCTION OF PAIN IS POSITIVE IMPINGEMENT SIGN.
- FLEXION OF THE ELBOW AND INTERNAL ROTATION OF THE SHOULDER MAY INCREASE THE PAIN
- NEER’S TEST—REPEAT SIGN AFTER AN INJECTION OF LOCAL ANESTHETIC INTO THE SUBACROMIAL BURSA.

CROSS CHEST ADDUCTION
- ELEVATE THE SHOULDER TO 90° & THEN ADDUCT THE ARM ACROSS THE BODY IN A HORIZONTAL PLANE. PAIN OVER THE AC JOINT SUGGESTS AC JOINT ARTHRITIS.
- AC JOINT ARTHROSIS—SEEN OFTEN IN GOLFERS (OPPOSITE SIDE), WEIGHT LIFTERS

RC COMPLAINTS
- PAIN, ↓ SLEEP, OVERHEAD WEAKNESS, STIFFNESS, CATCHING, POPPING
- EXAM: ATROPHY, ECCHYMOSIS, WEAKNESS, SUBACROMIAL ROUGHNESS, PAIN, POSITIVE INJECTION TEST
- X-RAVS: GREATER TUBEROSITY REACTIVE CHANGES, ACROMIAL SOURCIL/SPUR, HIGH RIDING HUMERAL HEAD
CALCIFIC TENDONITIS

- Insidious onset
- Pain
- P.T. management is the best solution for short-term and long-term relief.
- Treatment is aimed at preventing a future or larger rotator cuff calcification.
- Try conservative approach - may need to remove or decompress if symptoms persist.

Sensation

- Check for patterns of sensory loss
- Radicular sensory loss reflects injury to a specific nerve root and correlates with dermatomes.
- Check dermatomes.
- Non-radicular sensory loss reflects more peripheral nerve injury, the involved area may overlap dermatomes.
- Glove or stocking sign:
- Signifies a circumferential sensory deficit in the entire portion of the involved limb distal to a certain point.
- Usually reflects:
  - Diabetic patient - peripheral neuropathy
  - Reflex sympathetic dystrophy
  - Nonorganic disorders

Sensory

Reflexes

Segmental Nerve Supply in Upper Limb

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<th>Shoulder</th>
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<td></td>
<td>Finger/thumb (long tendons)</td>
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<tr>
<td>Hand</td>
<td>Small muscles</td>
<td>T1</td>
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<tr>
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CERVICAL LORDOSIS

Normal

Abnormal

Greater tuberosity reactive changes, acromial spur, high-riding humeral head
MANDY 45 YEAR OLD WORK COMP PATIENT

- Take over care
- Not happy with her last doctor
- Came into my clinic with her shoulder MRI results
- Accompanied by her WC case manager
- MRI lifting heavy material for work sudden pain in shoulder and arm

MANDY REFUSED EXAM

- All previous studies normal
- MRI reveals partial RC tear
- Demanded that I schedule her for surgery
- Did not want to participate in exam
- Patient refused diagnostic injection
EDUCATE THE PATIENT

• I explained to Mandy the purpose of examination.
• I asked her about her holding her hand over her head......
  • She subsequently explained that was the only comfortable position she could get in.
• I explained that I would like to examine both the C-spine and shoulder.
• I also wanted X-rays of the C-spine and shoulder.
• I explained that in the end I would do a diagnostic injection of the shoulder to differentiate the 2.
  • Mandy refused.
• I refused to treat the patient.

4 MONTHS LATER

• Mandy returns to my clinic, with her case manager.
• She has had a partial RCR by another doctor.
• She continues to have pain in the shoulder and C5-6 nerve root distribution.
• She finally allowed me to examine her.
  • She has a positive Spurling’s test.
  • Pain in the C5-6 nerve root distribution.
  • Weakness in the biceps and brachioradialis, and muscle atrophy in the trapezius.

WHAT WE HAVE LEARNED

• She should have allowed the diagnostic injection in the beginning.
• If the shoulder injection gave her complete relief then I would have suspected this was coming from the shoulder.
• If the shoulder injection did not give her significant relief I would have ordered an MRI of the C-spine.
• At this time, I did order an MRI of the C-spine. It revealed the patient had a large HNP at the C5-6 with early degenerative changes.
• She has had moderate relief with an ESI and is waiting to decide on surgery.

TREATMENT

• Evaluation
• Injection (Steroid/Anesthetic)
• Physical Therapy
• Ice
• If not 50% better in 3 weeks—MRI
• If injection gave them absolutely no relief...that's not where the problem is.
• If suspect labral pathology or under 40—MRI/Arthrogram, Epidurals.
• Surgery is always last resort.
CASE 2
• 52 Y.O. MALE PRESENTS TO MY CLINIC AFTER HAVING ALREADY SEEN 2 M.D.’S
• HE HAD A COMPLETE UROLOGIC WORKUP—IT WAS NEGATIVE
• HE HAD X-RAYS & MRI OF SHOULDER—ALL NEGATIVE
• CC: MY HAND GOES NUMB WHEN I URINATE IN THE MORNING.
• HE WAS FIRST SEEN BY MY INTERN
• ????????? JOKE ?????????
• IS HE FOR REAL?

CC: MY HAND GOES NUMB WHEN I URINATE IN THE MORNING

• LISTEN TO THE PATIENT
• HIS DIAGNOSIS WAS QUITE SIMPLE AND A GREAT TEACHING EXPERIENCE FOR MY INTERN
• ASK APPROPRIATE QUESTIONS IN YOUR H&P

CC: MY HAND GOES NUMB WHEN I URINATE IN THE MORNING

REPRODUCE THE SX’S
DON'T MISS THE OBVIOUS

- THE DIFFERENTIAL DIAGNOSIS IS BROAD
- GO BACK TO BASICS
- HISTORY PHYSICAL EXAM
- MOI
- REPRODUCE THE SYMPTOMS
- EVALUATE THE PATIENT
- IF IT DOESN'T MAKE SENSE...IT DOESN'T
- DO NOT MISS THE RED FLAGS

WHAT'S THE BIGGEST LATERAL ROTATOR OF THE NECK?

THE GLUTEUS MAXIMUS

THANK YOU

MARY VACALA ATC, PA-C