Differentiating Shoulder Versus Cervical Spine Pathology: A Pain in the Neck
Introduction

- Cervical spine and rotator cuff pathology may present in very similar clinical patterns.

- Thorough knowledge of spine and shoulder anatomy is essential.

- Meticulous physical examination along with simple diagnostic studies can make the difference between wrong operations!
So why is this such a pain in the neck?

- 51 year old female librarian
  - While at work lifting boxes of books (60lbs)
  - Lost balance and slipped
  - Felt immediate pain in her neck and shoulder
  - Shoulder and C-Spine radiographs - normal
Simple Anatomy

Write an essay on what's the position if you remove the wrong organ.
Rotator Cuff Anatomy

- The rotator cuff is made up of four muscles and their corresponding tendons.
  - Supraspinatus
  - Infraspinatus
  - Subscapularis
  - Teres minor
- Originate from the scapula, and together form a single tendon unit over the head of the humerus named the “rotator cuff”.
Rotator Cuff Pathology

- Rotator cuff pathology is most commonly caused by extrinsic (outside) causes.
  - Traumatic tear from a fall or accident.
  - Overuse injuries from repetitive lifting, pushing, pulling, or throwing.
Cervical Spine Anatomy

- 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.
So who is best to evaluate this situation?

Shoulder Surgeon vs Spine Surgeon
Clinical Symptoms: Rotator Cuff versus Cervical Radiculopathy

<table>
<thead>
<tr>
<th>Rotator Cuff</th>
<th>Cervical Radiculopathy</th>
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<tr>
<td>• Atrophy/thinning of the shoulder muscles</td>
<td>• Reduction in pain with arm abduction (Decreases nerve root tension)</td>
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<tr>
<td>• Pain with abduction (lifting) of the arm</td>
<td>• Sensory changes along a nerve root dermatome.</td>
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<td>• Pain with lowering a fully raised arm</td>
<td>• Small percentage of patients will have weakness without significant pain.</td>
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<td>• Weakness with arm rotation</td>
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Hmmm....
The symptoms sounds so similar.
What else can I do?
Physical Examination

- The physical exam should be systematic and may involve using special maneuvers.

- Specials tests include the
  - Neer’s, Hawkins’, and Jobe’s tests for rotator cuff pathology
  - Spurling’s sign for cervical radiculopathy.
Neer’s Test

- Tests for impingement of the rotator cuff tendon.
- The patient is asked to forward flex a fully pronated arm.
- The examiner prevents the scapula from moving and provides resistance against further forward flexion.
- This test will cause pain in patients with cuff pathology.
Hawkin’s Test

- The Hawkins’ test is an alternative to the Neer’s test.

- The patient forward-flexes the arm to 90 degrees and flexes the elbow to 90 degrees.

- The examiner internally rotates the humerus in order to impinge the greater tuberosity against the acromion.
Jobe’s Test

- Isolates the supraspinatus tendon.
- Abduct the arm to 90 degrees. Arm is angled forward 30 degrees. The thumb is then turned towards the floor.
- Patient tries to lift against the resistance.
- + test is pain along lateral deltoid muscle.
Spurling’s Sign

- Patient should extend the neck and laterally tilt the head to the affected side.
- Examiner should apply downward force to the top of the head.
- If the test is positive, the re-creation of the radicular pain or paresthesia will be evident.
So what do all these exam findings really tell me?

- Should help to localize pathology
Back to the original patient

- Further questioning reveals:
  - Pain that radiates **BELLOW** the elbow into the hand.
  - Pain that originates in the **NECK**.
  - Prior history of neck pain
Now its time to order further imaging

- Obtaining an MRI prior to physical examination will lead to an erroneous diagnosis and expensive workup for asymptomatic findings.

- The simple provocative maneuvers mentioned previously can help differentiate the source of pain and provide a more focused treatment algorithm.
So what was done on this patient?

"Nurse, get on the internet, go to SURGERY.COM, scroll down and click on the 'Are you totally lost?' icon."
Clinical Scenario

- Shoulder MRI ordered:
  - Partial thickness rotator cuff tear
  - Patient failed shoulder physical therapy
  - Underwent a subacromial decompression, rotator cuff debridement, and biceps tenodesis
And how did she do?

"- OK, if you elect not to have the surgery, the insurance company offers six days and seven nights in Barbados."
Patient Never Improved

- Engaged in physical therapy
- Work Hardening
- Functional capacity evaluation at 6 months and released with permanent disabilities.
Patient continues to suffer and decides to see me with her private insurance.
On My Examination

- Pain that radiates into her hand
- Specifically her thumb, index, and long fingers
- Pain is reproduced with a Spurling’s sign
- Weakness in her brachioradialis and triceps
- Decreased pinprick sensation in the C6 and C7 dermatome.
Cervical Spine MRI
Still... maybe the patient isn’t reliable

Its worker’s comp right?
The Value of Diagnostic Injections

- If the pathology appears to be coming from the shoulder then a subacromial injection.

- If the pathology appears to be coming from the cervical spine then a SELECTIVE nerve root injections
I ordered a TFESI C6/C7 Nerve roots

Patient experienced 100% pain relief
So what was done?

- Patient underwent a C5-6, C6-7 ACDF with Microscope
  - She stated that while on the floor for the first time in 1 year her pain was gone.
- At 6 months, she was completely fused and asymptomatic
  - Patient had lost her job and had to find work elsewhere
So let's review what went wrong

- Patient stated she had symptoms originating from her neck
- Arm pain went below the elbow
- Patient had nerve specific muscle weakness
- A CERVICAL SPINE MRI should have been ordered!!!
Shoulder Versus Neck Treatment Algorithm
Cervical versus Rotator Cuff Treatment Algorithm

Patient presents to the office

Detailed History

Where does the pain originate?
Does it go below the elbow?
Prior history of neck/shoulder pain?
Mechanism of injury

Thorough Physical Exam
Spurling's Sign
Jobe's, Hawkins', Neer's Signs
Motor Strength, Sensory Exam

Shoulder-Like Symptoms
Cervical Spine-Like Symptoms

Shoulder MRI
Sub-Acromial Injection

Cervical Spine MRI
TFESI
Conclusion

- A patient with diffuse complaints of shoulder pain may actually have either shoulder or cervical pathology.

- A complete history and physical exam and use provocative physical maneuvers, the examiner can discover the underlying cause of the symptoms.
Summary

- A systematic history and physical examination will help the treating physician to order specific diagnostic studies providing a focused treatment algorithm allowing patients to recover quicker and return to work and activity sooner.