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



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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?

THE PAIN STARTS IN MY HUSBAND'S LOWER BACK, THEN IT TRAVELS UP HIS SPINE TO HIS NECK, THEN IT COMES OUT HIS MOUTH AND INTO MY EARS. AND THAT'S WHY I GET THESE HEADACHES.



- 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

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.

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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

Rotator Cuff		Cervical Radiculopathy	
•	Atrophy/thinning of the shoulder	•	Reduction in pain with arm
	muscles		abduction (Decreases nerve root
•	Pain with abduction (lifting) of		tension)
	the arm	•	Sensory changes along a nerve root
•	Pain with lowering a fully raised		dermatome.
	arm	•	Small percentage of patients will
e	Weakness with arm rotation		have weakness without significant
			pain.

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.

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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 **BELOW** 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?



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



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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 lets review what went wrong



"Your operation! What about mine then!"

- 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



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.

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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.