

A 43-year-old man comes to the clinic due to a 2-day history of right shoulder pain and weakness. He was attempting to ride a skateboard when he fell, landing on his outstretched hands on the sidewalk. The patient has had partial relief of his pain from over-the-counter analgesics. His medical history is unremarkable, and he takes no prescription medications. He drinks 1 or 2 beers a day but does not use tobacco or illicit drugs. Vital signs are normal. On examination, the patient has scattered abrasions at the palms and elbows. Initial inspection of the shoulder is normal, with no visible deformity or bony tenderness. However, he has significant weakness in abduction on the right compared to the left. After passive abduction of the right arm above the head, the patient is asked to slowly lower his arm; as he is lowering it below horizontal, the arm suddenly drops rapidly, associated with moderate, sharp pain. Which of the following is the most likely diagnosis in this patient?

- ☐ A. Biceps tendon tear
- ☐ B. Humeral neck fracture
- ☐ C. Long thoracic nerve injury
- ☐ D. Lower brachial trunk injury
- ☐ E. Rotator cuff tear

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- ☐ A. Biceps tendon tear [3%]
- ☐ B. Humeral neck fracture [9%]
- ☐ C. Long thoracic nerve injury [8%]
- ☐ D. Lower brachial trunk injury [8%]
- ☒ E. Rotator cuff tear [72%]

Proceed to Next Item

Explanation:

User Id: [REDACTED]

Rotator cuff tendinopathy & tear	
Rotator cuff impingement or tendinopathy	<ul style="list-style-type: none">• Pain with abduction, external rotation• Subacromial tenderness• Normal range of motion with positive impingement tests (eg, Neer, Hawkins)
Rotator cuff tear	<ul style="list-style-type: none">• Similar to rotator cuff tendinopathy• Weakness with abduction & external rotation• Age >40

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This patient with impaired abduction at the shoulder following a fall on his outstretched

Rotator cuff tear

- **Weakness** with abduction & external rotation
- Age >40

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This patient with **impaired abduction** at the shoulder following a fall on his outstretched hands has a **rotator cuff tear**. The rotator cuff is formed by the tendons of the supraspinatus, infraspinatus, teres minor, and subscapularis muscles. The **supraspinatus** is most commonly injured due to degeneration of the tendon with age and repeated ischemia induced by impingement between the **humerus and the acromion** during abduction.

A complete supraspinatus tear causes weakness of abduction, which can be appreciated in the **drop arm test**. In this test, the patient's arm is abducted above the head and the patient is asked to lower the arm slowly. With a complete tear, the patient will be unable to lower the arm smoothly and it will drop rapidly around mid-adduction. Although the supraspinatus is the primary muscle responsible for initiating the first 15 degrees of abduction, the loss of smooth adduction in the drop arm test typically occurs when the humerus is near the horizontal plane. **MRI** can confirm the diagnosis, and treatment usually requires **surgery**.

(Choice A) Rupture of the tendon of the long head of the biceps occurs in forceful flexion of the arm. It produces sudden pain with an audible pop and a visible bulge ("Popeye sign") where the biceps muscle retracts into the upper arm.

(Choice B) Fracture of the surgical neck of the humerus may cause axillary nerve injury with paralysis of the deltoid and teres minor muscles and sensory loss over the lateral upper arm. However, patients typically have bony tenderness, swelling, ecchymosis, or crepitus over the fracture. In addition, the drop arm test is more reflective of supraspinatus function. Although the deltoid is responsible for shoulder abduction between 15-90 degrees, deltoid weakness is best appreciated at extreme extension rather than abduction.

(Choice C) Injury to the long thoracic nerve causes weakness of the serratus anterior with impairment at extreme abduction (>90 degrees) due to inability to rotate the scapula upward. It is usually caused by penetrating trauma or medical/surgical procedures (eg, chest tube insertion).

(Choice D) The lower (inferior) trunk of the brachial plexus originates from the C8 and T1 cervical roots and can be injured in sudden upward traction on the arm (Klumpke palsy). Muscles supplied by the ulnar nerve (eg, intrinsic muscles of the hand) are commonly affected, which results in weakness and atrophy of the hypothenar and interosseous muscles and "claw hand" deformity.

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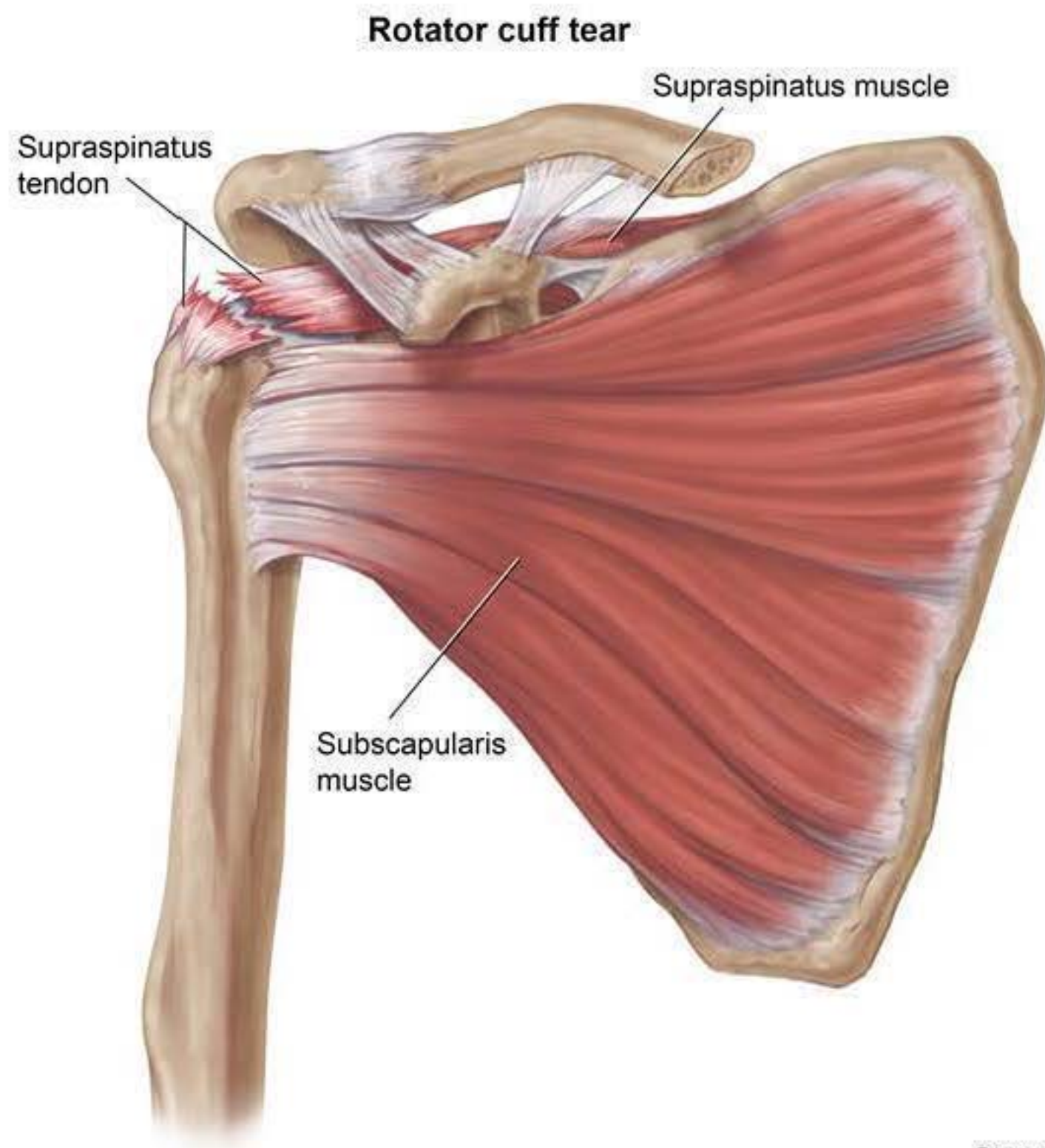
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Educational objective:

Rotator cuff tears cause pain and weakness of abduction at the shoulder. With the arm abducted over the head, the patient may be unable to smoothly lower the arm (drop arm test). An MRI scan can confirm the diagnosis.

Media Exhibit

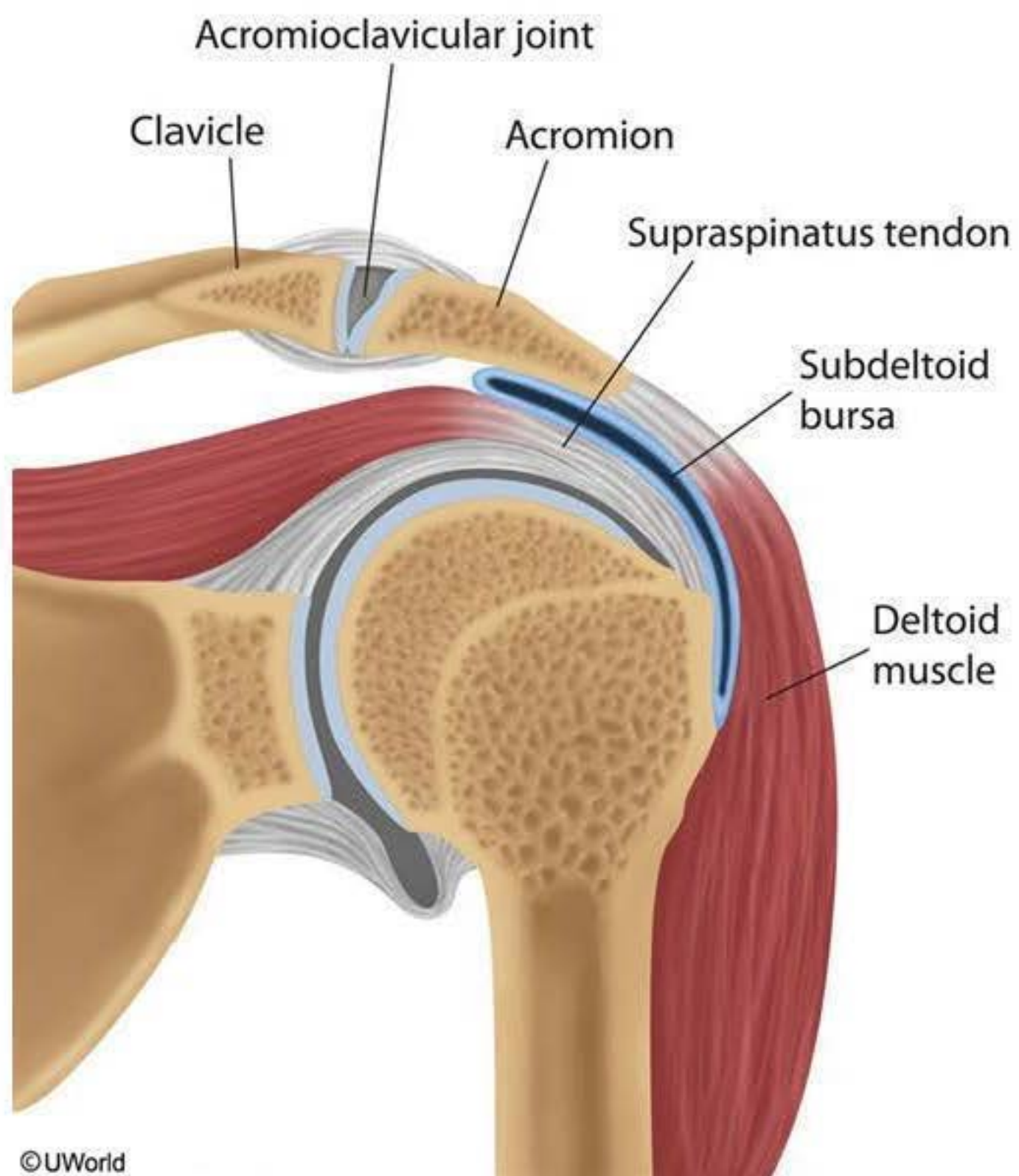
cuff muscles, anterior & posterior views



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Media Exhibit

cuff



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