Shoulder impingement: the role of the scapula

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The scapula plays a key role in normal scapulohumeral rhythm to allow maximum rotation of the humerus, especially in the abducting arm. Biomechanical studies have shown that the scapular motions of posterior tilt, external rotation, and upward rotation are associated with optimal shoulder function. Patients with impingement have been shown to have altered motions of the scapula. They demonstrate anterior tilt, excessive internal rotation, and lack of upward rotation. These biomechanical deficits create scapular protraction, which results in a narrowed subacromial space, decreased demonstrated rotator cuff strength, and mechanical impingement at lower levels of arm abduction or forward flexion. Physiological causes for these biomechanical deficits include tightness of the pectoralis minor and short head of the biceps, muscle weakness of the serratus anterior, and alteration of the activation pattern between the upper and lower trapezius muscles. These alterations in scapular motion are called scapular dyskinesis, and are very common in patients with symptoms of impingement. Diagnostic evaluation of patients with impingement symptoms should include evaluation for the presence or absence of scapular dyskinesis, and should demonstrate the effect of corrective maneuvers to change scapular position on the impingement symptoms. The examination should assess resting scapular position and then evaluate scapular motion upon elevation and depression of the arm. Prominence of the medial scapula border has been correlated with biomechanically determined scapular internal rotation, and can be considered clinically useful to demonstrate scapular dyskinesis. The scapular assistance test (SAT) is a corrective maneuver that increases posterior tilt and can be associated with a decrease in impingement symptoms. The scapular retraction test (SRT) stabilizes the scapula and can show increased apparent rotator cuff strength. This information can then be used to establish the comprehensive treatment program for patients with impingement symptoms.