Shoulder Impingement Revisited: Evolution of Diagnostic Understanding in Physical Therapy and Orthopaedic Surgery

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I. Shoulder impingement syndrome as a diagnostic label.
   a. large number of potential tissue pathologies
   b. kinematic presentation variable between studies

II. Surgical History
   a. Neer series of cases/ anterior acromioplasty
   b. premise that compression and mechanical abrasion of the rotator cuff and subacromial bursa occurred beneath only the anterior portion of the acromion as the arm was elevated
   c. rotator cuff tendinitis and subacromial bursitis resulting which could progress to rotator cuff tearing
   d. literature support, shape of the acromion, size of the supraspinatus outlet
   e. number of anterolateral acromioplasties increased dramatically
   f. primarily arthroscopic technique
   g. Neer test
   h. Additional mechanisms, surgeons focused toward anatomical mechanism

III. Differing Clinical Perspectives: Surgical Versus Conservative Care
   a. physical therapy simultaneously evolving
   b. focus on movement and exercise aspects of the condition
   c. superior translation of the humeral head or lack of posterior tilting or upward rotation of the scapula identified in patient populations and theorized to contribute either as primary or secondary factors
   d. therapeutic goals are often directed toward stretching and strengthening of muscles and other soft tissues
   e. disparities in professional thought on contribution of glenohumeral instability
f. impingement syndrome diagnostic label has become too broadly used to effectively allow decisions to be made regarding if or when surgery is appropriate, or which surgery might be most effective.

g. differing perspectives of therapists and surgeons causing increasing difficulties in communication with regard to both patient care and scientific investigation

IV. Subtypes of Impingement
   a. subacromial impingement
   b. internal impingement
   c. coracoid impingement
   d. greater understanding of influence of amount of arm elevation – cuff clears the acromion prior to 90 degrees of elevation, implications for painful arc
   e. “shoulder impingement” as an obsolete diagnosis
   f. lack of preferential effectiveness of acromioplasty over other interventions
   g. “anterior shoulder pain of unknown etiology”

V. Clinical Diagnostic Tests
   a. Neer test
   b. Hawkins
   c. Limited anatomical validity
   d. not specific for differentiating subacromial versus internal impingement
   e. Hawkins may be more reliable in reducing the subacromial space
   f. Neer test position may involve relatively more reduction in distance to the glenoid

VI. Current Challenges
   a. difficulty with optimal care of patients with anterior shoulder pain
   b. scientific publications are using the term impingement syndrome with increasing frequency
   c. patients with anterolateral shoulder pain can have a variety of different etiologies
   d. rotator cuff, biceps tendon, superior labrum, coracoacromial ligament, subacromial bursa all potential tissue etiologies
   e. diagnostic labels of shoulder impingement, subacromial bursitis, subacromial impingement, internal impingement, shoulder tendonitis or tendinopathy, shoulder bursitis, long head biceps tendonitis or tendinopathy, rotator cuff tendinitis or tendinopathy, partial thickness rotator cuff tearing, rotator cuff tear, or labral tear not consistent among practitioners
f. scientific investigators using the diagnostic label of “shoulder impingement” are not studying homogenous patient groups, and are not able to determine consistent etiologic factors or recommend specific treatment interventions

g. “Rotator Cuff Disease” as alternate diagnostic label

h. diagnosis does not clearly direct treatment

i. limitations with imaging

j. asymptomatic tears

VII. The Path Forward

a. mechanical conditions of rotator cuff/long head biceps tendon proximity to potential impinging structures, tendon compression, and tissue stress, should be investigated as possible contributing mechanisms to rotator cuff/long head biceps disease, bursitis, and anterior or posterior shoulder pain

b. “mechanical impingement” including compression or frictional shear causing abrasion, should be clearly distinguished from a diagnostic label of “shoulder impingement syndrome”

c. glenohumeral movement patterns should continue to be investigated to determine if abnormal patterns are pathological contributors to “mechanical impingement”, labral pathology, rotator cuff/long head biceps disease, bursitis, and anterior or posterior shoulder pain

d. the diagnostic label of “shoulder impingement syndrome” should be discontinued as this diagnosis has become too broad to effectively direct treatment

e. alternative surgical diagnostic labels might include tissue pathologies that can be confirmed by imaging when appropriate (tendinitis, partial vs. full thickness tear, etc.)

f. alternative diagnostic labels might be based in the movement system, related to impairments contributing to shoulder pain and dysfunction, such as posterior shoulder tightness or glenohumeral instability.

VIII. Mechanical Impingement and Abnormal Movement Patterns

a. evidence of abnormal movement patterns in these populations

b. epidemiologic literature linking shoulder pain and dysfunction to specific occupations or activities

c. experimental investigations

d. causation versus association

e. assumptions about how angular motion or position changes will impact rotator cuff proximity to potential impinging structures
f. experimentally induced subacromial pain and rotator cuff dysfunction

g. risk in certain occupations and overhead athletes

h. animal models of overuse and extrinsic compression

i. “mechanical impingement” as a contributor to the development and progression of rotator cuff disease.

IX. Alternative Diagnostic Labels Based in the Movement System

a. Diagnosis of exclusion

b. pain localization

c. posterior shoulder tightness, glenohumeral microinstability, or scapular “dyskinesia”

d. scapular assistance test

e. subgrouping patients based on physical examination findings

X. Case Examples & Discussion

References


