ANJC presents

The Secrets of Scapular Dynamics in Shoulder, Cervical and Thoracic Spinal Conditions and Injuries

featuring

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Acute Shoulder Injuries

“...soft tissue injuries include shoulder dislocations, rotator cuff tears, and acromio-clavicular sprains ... rotator cuff tears can be managed conservatively or surgically...”

Childhood and Adolescent Sports-Related Overuse Injuries

“... one half of all sports injuries in children are preventable with proper education and use of protective equipment ... proper technique... injuries can be managed conservatively...”

MRI Findings in Throwing Shoulders:

“...93% of the throwing shoulders had abnormal magnetic resonance imaging findings, only 37% were symptomatic ...

Identifying and Managing Shoulder Pain in Competitive Swimmers...

“...shoulder pain resulting from glenohumeral instability is common among competitive swimmers. The biomechanics inherent to swimming promotes muscular imbalances that stresses the capsulo-ligamentous structures and contribute to shoulder instability...”

RESEARCH REPORT

Resting Position Variables at the Shoulder: Evidence to Support a Posture-Impairment Association

“...relationships among posture, pectoralis minor muscle length, and movement alterations at the shoulder...scapula orientation, thoracic kyphosis, and pectoralis minor muscle lengths were measured ... significant group differences were demonstrated for several posture variables...thoracic spine kyphosis and scapular internal rotation...”

Postural Distortions
“...pectoralis minor resting length...individuals with subacromial impingement have altered scapular kinematics...loss of posterior tipping and increased internal...these results support the theory that an adaptively short pectoralis minor may influence scapular kinematics and is therefore a potential mechanism for subacromial impingement...”

Shoulder function and 3-dimensional scapular kinematics with and without shoulder impingement syndrome.

“...slightly greater scapular upward rotation and clavicular elevation during flexion and slightly greater scapular posterior tilt and clavicular retraction during scapular-plane ... the kinematic differences found in subjects with impingement may represent scapulothoracic compensatory strategies for glenohumeral weakness or motion loss...”

Scapulothoracic and Glenohumeral Kinematics Following an External Rotation Fatigue Protocol

“...The external rotator muscles of the shoulder are important for normal shoulder function. Impaired performance of these muscles has been observed in subjects with impingement syndrome ...”

Pathomechanics in Atraumatic Shoulder Instability: Scapular Positioning Correlates with Humeral Head Centering

“...unstable shoulders had malcentering...of the humeral head in the direction of instability during various arm positions... the high correlation suggests that scapular positioning is relevant for humeral head decentering...”

Anatomical and Biomechanical Mechanisms of Subacromial Impingement Syndrome.

“...subacromial impingement syndrome is the most common disorder of the shoulder, resulting in functional loss and disability...dysfunctional glenohumeral and scapulothoracic movement patterns...”

A Retrospective, Descriptive Study of Shoulder Outcomes in Outpatient Physical Therapy

“... 55.1% had shoulder impingement...18.3% had postoperative repair, 8.9% had a frozen shoulder, 7.6% had a rotator cuff tear, 3.0% had shoulder instability, 2.1% were post fracture...demonstrated improvement in both clinical and functional measures at the conclusion of physical therapy...”

NEUROPATHOLOGY

KINESIOPATHOLOGY

ETIOLOGY

• WEIGHT LIFTERS
• THROWING ATHLETES
• HEAVY LABORERS

ACUTE PRESENTATION

• INCREASE SENSATION LATERAL ASPECT FOREARM
• PAINFUL/INABILITY TO FLEX ELBOW
• DECREASED STRENGTH OF BICEPS AND BRACHIALIS

CHRONIC PRESENTATION

• DECREASE SENSATION LATERAL ASPECT FOREARM
• MOTORIC INABILITY TO FLEX ELBOW
• DENERVATED STRENGTH OF BICEPS AND BRACHIALIS
**ETYMOLOGY**

- FORCIBLY ABDUCTED & EXTERNALLY ROTATED ARM
- THROWING SPORTS

**NEUROPATHOLOGY**

- LATERAL AXILLARY HIATUS SYNDROME
- QUADRILATERAL SPACE SYNDROME

**MYOPATHOLOGY**

- FORCIBLY ABDUCTED & EXTERNALLY ROTATED ARM
- THROWING SPORTS
SHOULDER ARTHROKINEMATICS

KINESIOPATHOLOGY

FORCE COUPLE

CRITICAL AREA
- 1 CM PROXIMAL TO GREATER TUBEROSITY
- HYPOVASCULARITY SUBJECTIVE FOR TEAR OF SUPRASPINATUS TENDON
STERNOClavicular Joint

- Sternoclavicular Capsulitis
- Chondromalacia
- Crepitation
- 1st Rib Subluxation

Histopathology
**NEUROPATHOLOGY**
- Suprascapular nerve impingement
- Rotator cuff impingement
- Lateral axillary hiatus syndrome
- Quadrilateral space syndrome

**MYOPATHOLOGY**
SCAPULOHUMERAL MUSCULATURE POSTERIOR VIEW

MYOPATHOLOGY

SUPRASCAPULAR NERVE DAMAGE

QUADRILATERAL SPACE SYNDROME

NEUROPATHOLOGY
Sample test question:

Patient sustains an injury to the left shoulder resulting in an inability to abduct and externally rotate the shoulder. Name the nerve(s) and muscles injured and proposed mechanism of injury.
Entrapment Neuropathies

Entrapment neuropathies are any condition in which a peripheral nerve is injured, irritated or otherwise compromised, by external pressure created by compression or impingement in its course through a fibrous or osseofibrous tunnel, or at a point that the nerve changes direction through or over a fibrous or muscular band.
Sympathetic Nerve Supply to Upper Extremities

Lateral Horn T2-T9, 10
↓
Anterior Roots
↓
White Rami
↓
Sympathetic Trunk

Stellate Ganglion
↓
T2, Ganglion

Synapse
↓
Gray Rami
↓
Join Brachial Plexus
Although indicated schematically as distinctly demarcated zones, in actuality each dermatome overlaps its adjacent segment.
ABSTRACT: The glenoid fossa is retrotilted with respect to the plane of the scapula in most normal shoulders. Saha suggested that a ventral tilt or anteversion of the glenoid was associated with anterior instability of the joint... In normal shoulders, the humeral head remains centered on the glenoid fossa throughout elevation in the scapular plane. The distance between the inferior surface of the acromion and the humeral head, measured radiographically, averages 8-10 mm in normal shoulders.
The role of the scapula

ABSTRACT: The scapular musculature is often neglected in designing a rehabilitation protocol for the shoulder. Weakness of the scapular stabilizers and resultant altered biomechanics could result in:

1) Abnormal stresses to the anterior capsular structures of the shoulder,
2) Increased possibility of rotator cuff compression, and
3) Decreased performance.

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Author(s): Paine R; Voight M.
The role of the scapular stabilization in overhead motion

ABSTRACT: The scapular stabilizers are responsible for providing proper stability and mobility of the scapula against the thorax (scapulo-thoracic joint). Many of the glenohumeral joint muscles attach to the scapula, thus control of the scapula on the thorax is critical in order for the glenohumeral joint musculature to function optimally during overhead movements.

The role of the scapular stabilization in overhead motion

This article discusses the role of the scapular stabilizers on the prevention and treatment of subacromial impingement syndrome, reviews the significance of these muscles on throwing performance, and illustrates exercises for strengthening the muscles responsible for scapular stabilization.

A force couple is the action of two forces acting in opposite directions to impose rotation about the axis.
This coupling effect was confirmed by Mosely et.al. who performed electromyographic analyses during several scapular exercises. The force couple provides an extremely important function with upward rotation of the acromion away from the humerus in forward elevation of the shoulder, thereby preventing impingement.
TEARS / RUPTURES / REPAIR OF THE ROTATOR CUFF

Acute rupture (superior view). Often associated with splitting tear parallel to tendon fibers. Further retraction results in crescentic defect as shown at right.


Repair. If freshened edges of tear cannot be brought together, notch is created in humerus just beneath articular surface to allow attachment of tendon through drill holes in bone, using strong sutures.
Shoulder Video
Wrap Up

- Become the Leading Extremity Expert in your Community
- Learn Dr. Mally’s “Sniper Specific” Techniques of Extremity Adjusting
- Learn how to help patients and exponentially increase your business at the same time

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