Dynamic Chiropractic

MUSCULOSKELETAL PAIN

Managing Shoulder Sprain/Strain Injuries

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Many of the shoulder problems that chiropractors see involve one or more forms of rotator mechanism dysfunction. This chronic biomechanical continuum usually begins with dysfunction of the rotator cuff muscles and progresses to rotator cuff syndrome; supraspinatus tendinitis; impingement syndrome; subdeltoid and subacromial bursitis; calcific shoulder bursitis; and even most cases of frozen shoulder and bicipital tendinitis. In such cases, there is no direct, acute injury.

However, as the shoulder is a very mobile joint with little stability in certain positions,[1] the soft tissues of the shoulder region can be injured during athletic and recreational activities, at work or in a fall. Every acute sprain and strain injury to the shoulder must be properly treated and fully rehabilitated if future problems are to be avoided. Chronic instability is a real possibility after an injury, since the surrounding muscles and connective tissues are the true source of shoulder joint stability.[2]

Function of the Shoulder Joints

The shoulder is made up of several joints that must function together smoothly to provide the extreme mobility possible and necessary for many activities. The shoulder joint complex includes the sternoclavicular, acromioclavicular and glenohumeral joints, and the scapulothoracic articulation (a pseudojoint). The upper thoracic spine should also be considered a major contributor to shoulder motion, especially during overhead reaching (when reach is extended as the spine tilts away from the shoulder), and during throwing.[3] The connective and muscular tissues that support and move these joints will need to be assessed, so that support can be provided for the healing of any injured tissues. Eventually, rehabilitation of all injured tissues will be necessary to regain full function.

There are many connective tissues in these joints that can be injured, resulting in a shoulder sprain. The sternoclavicular joint is the only point at which the shoulder girdle is firmly attached to the axial skeleton. The ligaments involved are the sternoclavicular and costoclavicular. The acromioclavicular (AC) joint is held in place by the coracoclavicular and acromioclavicular ligaments. A thick capsule composed of several ligaments secures the humerus into the labrum of the glenohumeral joint. The scapulothoracic "joint" has muscular connections only; there are no ligamentous attachments.

Any of the numerous muscles and tendons that contribute to the movement and coordinated stability of these joints can become strained in a shoulder injury. The main muscles associated with the shoulder include the *trapezius*, *latissimus dorsi*, *pectoralis major*, deltoid, rotator cuff (SITS muscles), serratus anterior, and the biceps and triceps muscles. Manual testing can often quickly identify which of these muscles are weakened and painful upon contraction after an injury.

Shoulder Injury Mechanics

While shoulder injuries can be quite individual and complex, several common patterns have been

identified:[4]

- an arm forced into external rotation and abduction (anterior dislocation and/or labrum tear);
- a blow to the anterior shoulder (can cause ligamentous tears resulting in dislocation);
- a fall onto top of shoulder (may cause a ligamentous tear resulting in AC joint separation);
- a fall on an outstretched arm (can result in AC separation, posterior dislocation, labrum or rotator cuff tear);
- sudden traction to the arm (momentary subluxation or brachial plexus traction injury); or
- sudden pain during activity or lifting (consider rupture of muscle/tendon or labrum tear).

Rehabilitation of Shoulder Sprains

Significant damage to one or more of the connective tissues of the shoulder can result in joint instability and chronic dislocations. Treatment of grade 3 or moderate-to-severe grade 2 sprains generally includes some external support (sling or taping) and restricted activities. Once the ligaments have undergone sufficient early repair, controlled passive motion can help to prevent the formation of adhesions (scarring in areas of movement). Resistance exercises are introduced to stimulate a stronger repair and to assist in remodeling. Isometric is progressed to isotonic forms of resistance, based on the patient's tolerance for joint motion. For athletes, regaining full stability may require advanced forms of exercise in the functional phase of rehabilitation, such as proprioceptive training and plyometrics. These maneuvers help to re-coordinate the sensory receptors and motor controls at the spinal cord (nonthinking) levels.[5]

Rehabilitation of Shoulder Strains

Injured muscles and tendons of the shoulder girdle may need a brief period of support and restricted activity, but controlled restrengthening should be initiated early. Elastic tubing is a safe and effective method of providing progressive resistance exercises.[6] A very easy and effective program starts with a consistent isotonic exercise routine using surgical tubing equipment to perform external rotation. This is initially performed within a limited, pain-free range of motion, building to full range as pain subsides. Eventually, additional shoulder exercises should be performed as indicated, including internal rotation; flexion; extension; abduction; and adduction. This inexpensive rehabilitative program should initially be practiced under supervision to ensure proper performance.

Once good exercise mechanics and control are demonstrated, a self-directed program of home exercises is appropriate. As with sprain injuries, shoulder strains in athletes may require more specific, sports-performance exercises, such as eccentrics and plyometrics. Specific sports skills (such as throwing) may also need to be retrained.

A factor that is too frequently overlooked is the influence of posture on shoulder girdle function.

Reports by Hertling and Kessler[7] and Hammer[8] support the need to evaluate the patient for specific postural distortions, such as thoracic kyphosis and cervical anterior translation (causing a "forward head"). An additional complicating postural factor can be the alignment of the scapula on the thoracic cage - when the shoulder is "rolled forward" (protracted). Correction of these chronic alignment faults will significantly reduce the biomechanical stress on muscular support for the shoulder.

Conclusion

An appropriate and progressive rehab program should be started early in the treatment of patients with shoulder sprain and strain injuries, generally after ligaments and connective tissues have repaired sufficiently. Simple, yet effective rehab techniques are available, none of which require expensive equipment or great time commitments. A closely monitored home exercise program using exercise tubing is recommended, since this allows the doctor of chiropractic to provide cost-efficient, yet very effective and specific rehabilitative care.

The most important aspect is to recognize and address the biomechanical alignment problems and postural factors that are frequently associated with shoulder injuries. This entails screening the patient for forward head and flexed (kyphotic) torso postures. In addition, protracted (forward) shoulders change the angle of the scapula and compress the rotator cuff further. Failure to recognize these complicating factors will result in a patient with recurring shoulder complaints. When the shoulder girdle is properly aligned on the torso, the complex mechanism of the shoulder will be more likely to function optimally.

References

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