

Subscapularis: The Hidden Culprit

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The shoulder is a vastly complex structure. Seven joints are involved in functional movement of the shoulder girdle. Each of these joints is interdependent on the integrity and function of the others. They include the glenohumeral (scapulohumeral), suprahumeral (subdeltoid), scapulothoracic (scapulocostal), acromioclavicular, sternoclavicular, first contralateral sternocostal, and first contralateral costovertebral joints. With the gathering of an inordinate amount of data from each of these joints and their associated muscles, bursae, and ligaments, it is easy to see how 'information overload' might readily occur, with no clear indication of where therapy should begin.

The glenohumeral joint is considered by many to be the most important joint of the shoulder girdle. When all tissues associated with this joint are functioning normally, it has a greater degree of movement than any other joint in the body. Even when other joints of the girdle are restricted, if movements of the glenohumeral joint are healthy, the arm may be functional (at least to some degree) and allow some use of the limb. However, when the glenohumeral joint is restricted, there will be little or no use of the arm.

Since the convex ovoid humeral head significantly exceeds the surface area of the glenoid fossa, with which it articulates, only a small part of the surface of the humeral head articulates with the glenoid at any given time. A fibrocartilaginous rim - the glenoid labrum - extends the glenoid into a modified 'socket' and provides additional surface area. The highly mobile head of the humerus is capable of many combinations of swing and spin, however, its basic three planes of movement (abduction/adduction, flexion/extension and medial/lateral rotation) are most apparent when the scapula is fixed. Although this extreme mobility is necessary and useful, it also results in a relatively unstable joint.

Stabilization of the humeral head is provided through muscular support by supraspinatus, infraspinatus, teres minor and subscapularis, which

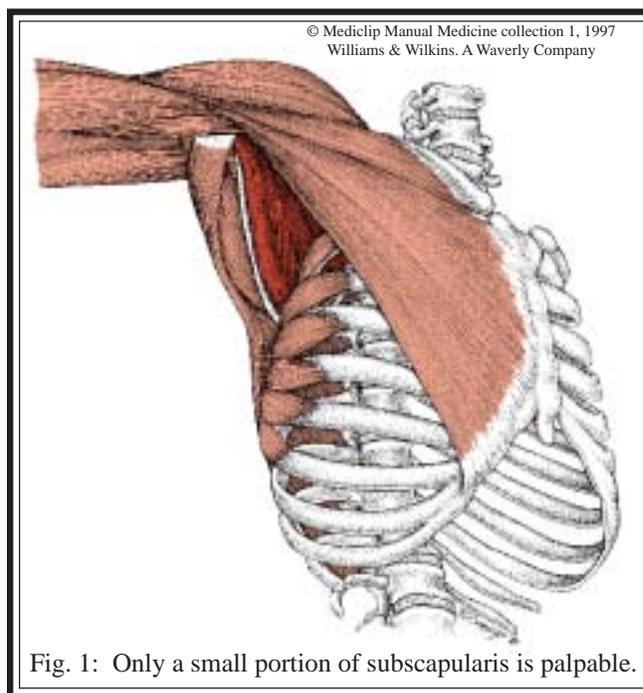


Fig. 1: Only a small portion of subscapularis is palpable.

are commonly called the rotator cuff or SITS muscles. The fibers of the SITS tendons blend with the joint capsule, which makes them especially vulnerable to injury since they are so closely approximated to the joint.

Subscapularis, a particularly important muscle when considering shoulder dysfunctions, is almost hidden from palpation. It has a broad attachment to the subscapular fossa and spans the glenohumeral joint to attach to the lesser tubercle of the humerus and the articular capsule. It passes over the anterior joint capsule and lies horizontally between the two almost vertical tendons of biceps brachii. Although it is a large, thick muscle, only a small portion of its belly can be palpated. (Fig. 1) Subscapularis provides medial rotation of the humerus which is assisted by latissimus dorsi, pectoralis major, and teres major. Its antagonists for medial rotation are infraspinatus and teres minor. It also provides adduction of humerus with the help of the most anterior and posterior fibers of deltoid, triceps long head, teres major, and pectoralis major,

while the middle deltoid fibers and supraspinatus antagonize this movement.

A primary indication for treatment of subscapularis is loss of lateral rotation and/or abduction of the humerus, common symptoms of ‘frozen shoulder’ syndrome. It may be injured or torn when the person throws the hands back to bear the body’s weight when falling backward. This impact will force the head of the humerus anteriorly against the joint capsule, the tendon of subscapularis and the subscapular bursa, which lies between the tendon and the joint capsule. The bursa communicates with the shoulder joint cavity and, if it becomes inflamed, may play a role in true “frozen shoulder” (Cailliet 1991, McNab & McCulloch 1994, Simons et al 1999), a condition associated with adhesions within the joint capsule.

When the initial action of abduction forces the humerus cephaladly, toward the overhanging acromion process, subscapularis provides downward tension on the head (Simons et al 1999), thereby preventing bony impaction and entrapment of soft tissues. However, trigger points or hypertonicity in subscapularis can cause the muscle to hold the humeral head fast to the glenoid fossa, creating a ‘pseudo’ frozen shoulder (Simons et al 1999). Chaitow & DeLany (2000) note “...*the humeral head appears immobile, as in true frozen shoulder syndrome, but without associated intrajoint adhesions. Ultimately, however, long-term reduced mobility and capsular irritation from subscapularis dysfunction may result in adhesive capsulitis (Cailliet 1991). Additionally, the subscapularis lies in direct relationship with serratus anterior within the scapulothoracic joint space. Myofascial adhesions of these tissues to each other may contribute to full or partial loss of scapular mobility.*”

Direct palpation of a portion of the subscapularis is possible in both supine (described below) and sidelying positions (DeLany 2002) to examine for altered tissue tone, painful tissues, and myofascial trigger points. The practitioner’s fingernails should be cut very short to avoid unnecessary discomfort. The practitioner should bear in mind that the subscapular area is often tender and only mild pressure should be initially used. The



Fig. 2: Preparation to treat subscapularis.

following describes the treatment of the patient’s right subscapularis. The directions should be reversed for the left shoulder.

The practitioner is positioned at chest level at the patient’s right side. The supine patient’s arm (elbow extended) is abducted and initially rests against the practitioner’s left shoulder. This position will allow sufficient room for the fingers of the practitioner’s right hand to slide onto the anterior surface of the scapula. (Fig. 2) The practitioner’s left hand is slid under the torso and cradles the posterior surface of the scapula with the finger pads contacting the vertebral border of the scapula. The fingers can then pull the scapula laterally to abduct it. This abducted position will allow room for the finger pads of the practitioner’s right hand to more easily slide onto the scapula’s anterior surface.

The following steps must occur simultaneously for the best result. The patient is asked to horizontally adduct the arm being treated. In other words, he/she slowly reaches across his/her chest with the arm being treated and attempts to touch the opposite shoulder. At the same time, the practitioner tractions the scapula laterally with the left hand while maintaining contact with and sliding further onto the anterior surface of the scapula with the finger pads of the right hand. (Fig. 3)



Fig. 3: Scapular positioning enhances access to subscapularis

Once in place, gentle, static pressure is applied by the finger pads of the practitioner's right hand at 1" intervals onto all accessible fibers of the subscapularis muscle. Friction of this muscle is not usually tolerable until the subscapularis is in a healthier state.

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Judith DeLany, a pioneer in the field of neuromuscular therapy since the early 1980s, is a published author of NMT course manuals and articles on pain management, and co-author (with Dr. Leon Chaitow) of *Clinical Application of Neuromuscular Techniques*, vols. 1 and 2. She is an associate editor for *Journal of Bodywork and Movement Therapies*, a peer-reviewed journal (Elsevier Science). Her primary focus is the advancement of education in all health professions to include soft tissue care and the myofascial treatment of chronic pain syndromes. Ms. DeLany's website is www.nmtcenter.com and her email address is nmtcenter@aol.com.