

Athletic Shoulder II

-Golf-

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Golf probably began in Scotland in the 1400s, although there are some traces of golf being played as early as 1350. Currently, golf has gained popularity both as a sport with millions of participants and as a spectator sport involving further millions of individuals.

Because golf is not considered an overhead sport, the incidence of acute shoulder injuries is relatively low. The shoulder appears to be at greatest risk for injury during extremes of motion. The nondominant or lead arm is usually involved. The phase of the golf swing and the specific complaint of the golfer can often provide information regarding the underlying cause of the problem (Table 1) (1). Predisposing factors for shoulder injuries from the repetitive stress of the golf swing include constitutional factors, insidious trauma, acute trauma, postinflammatory changes, postinfection sequelae, tumors, congenital defects, and other factors such as impingement syndrome, labral tears, rotator cuff tears, previous shoulder surgery, symptomatic previously placed staples and screws, and reflex sympathetic dystrophy (2).

The contributions of the shoulder muscles to the golf swing have been extensively studied. The subscapularis appears to be the most active muscle throughout the swing (3). The rotator cuff muscles on both sides show equal amounts of activity, indicating that the left shoulder of right-handed golfers does not provide more drive than the right shoulder. Pink et al.(4) demonstrated that certain muscles of the shoulder act during specific stages of the swing: the infraspinatus and supraspinatus predominate at the extremes of shoulder range of motion, the subscapularis and pectoralis major during the downswing, the latissimus dorsi during the forward swing, and the anterior deltoid during forward swing and follow-through. Finally, Kao et al.(5) found that the muscles associated with scapular movement and stabilization(i.e.

levator scapular, rhomboids, serratus anterior, and trapezius) are active during and contribute significantly to the biomechanics of the golf swing.

Table 1. Causes of shoulder discomfort in golfers by swing phase and anatomic area

<i>Location of pain</i>	<i>Anatomic area</i>	<i>Cause of problem</i>
Backswing		
Anterior shoulder	AC joint	Impingement Degenerative changes
	Anterior glenoid rim	Impingement
Posterior shoulder	Posterior capsule	Poor flexibility
Downswing		
Generalized	Scapular muscles	Weakness of scapular muscles
Follow-through		
Posterior shoulder	Rotator cuff muscles	Impingement
	Posterior labrum	
Generalized	Scapular muscles	Weakness of scapular muscles

Adapted from Jobe FW, Pink MM. Shoulder pain in golf. *Clin Sports Med* 1996;15:55-64.

Impingement syndrome, with associated rotator cuff tendonitis or rotator cuff tears, is common in golfers who present with shoulder pain. These injuries result from acute rotator cuff overload, intrinsic rotator cuff degeneration, or chronic overuse, which is a significant cause of impingement. Often, subtle instability leads to recurrent subluxation, rotator cuff abnormalities, and subsequent impingement (6). However, athletes may also present with pure and isolated impingement without any instability. Repetitive overuse of the shoulder yields definitive rotator cuff pathology (2).

The golf swing places an increased load on the acromioclavicular(AC) joint(1). Each golf swing places the arm in an adducted position and may result in spur formation under the AC joint, impingement of the rotator cuff on spur, or bursal side partial cuff tears. Degenerative joint disease occurs, leading to decreased range of motion and additional shoulder problems. Localized tenderness over the AC joint and exacerbation of the discomfort with cross-body

adduction are often noted (7).

Once a diagnosis has been established to explain the shoulder discomfort, treatment that emphasized rehabilitation should be instituted. The strengthening exercised should concentrate on both the rotator cuff muscles as well as the muscles responsible for scapular stabilization (i.e., serratus anterior and rhomboids). There are four exercises that are recommended for the shoulder complex. 1) Push-up with a plus 2) Horizontal rowing exercise 3) Scapular plane elevation(scaption) with humeral external rotation 4) Glenohumeral internal and external rotation.

References

- Jobe FW, Pink MM. Shoulder pain in golf. *Clin Sports Med* 1996; 15:55-64.
- Andrews JR, Whiteside JA. The shoulder. In: Stover CN, McCarrol JR, Mallon WJ, eds. *Feeling up to par: medicine from tee to green*. Philadelphia: FA Davis, 1994:127-142.
- Jobe FW, Moynes DR, Antonelli DJ. Rotator cuff function during a golf swing. *Am J Sports Med* 1986;14:388-392.
- Pink M, Jobe FW, Perry J. Electromyographic analysis of the shoulder during a golf swing. *Am J Sport Med* 1990;18:137-140.
- Kao JT, Pink M, Jobe FW, et al. Electromyographic analysis of the scapular muscles during a golf swing. *Am J Sport Med* 1995;23:1-5.
- Jobe FW, Bradley JP. The diagnosis and nonoperative treatment of shoulder injuries in athletes. *Clin Sports Med* 1989;8:419-438.
- Clarke HD, McCann PD. Acromioclavicular joint injuries. *Orthop Clin North Am* 2000;31:177-187.