



ORTHOPÆDICS

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Treating a Painful Shoulder Maximizing function with minimal pain

By Aaron A. Bare, MD

A painful shoulder can severely limit one's activity and function. As the most flexible and mobile joint in the body, repetitive use or trauma can damage the bone or surrounding structures.

Shoulder injuries may result from overuse activities or from trauma, such as falls or sporting accidents. More than four million people per year in the United States seek a physician's opinion for shoulder pain.

Advances in diagnostic and treatment modalities offer patients more reliable and less invasive treatment pathways. Improved anti-inflammatory medications and therapy regimens increase the likelihood of a painful shoulder improving without surgery. For conditions requiring surgery, minimally invasive shoulder arthroscopy or joint replacement surgery minimizes the recovery process for patients.

Shoulder pain can often be attributed to the bone or the surrounding soft tissues. Pain stemming from bone most often comes from the loss of cartilage or arthritis. Tears, loosening, or degeneration of the surrounding soft tissue may lead to pain with certain motions, a feeling of a loose shoulder (instability), or a combination of both. Other locations such as the neck (cervical spine) or strain to the muscles surrounding the shoulder (i.e., trapezius) may also refer pain to the shoulder region.

Anatomy

The shoulder is a ball-and-socket joint. The upper arm bone, called the humerus, forms the ball (or head), which articulates with a depression in the shoulder blade, or scapula. This socket is referred to as the glenoid.

The primary shoulder joint is thus referred to as the glenohumeral joint. Another important shoulder joint is the acromioclavicular (AC) joint, which forms as the collarbone meets the shoulder blade (scapula) on top of the shoulder. A circular layer of cartilage, called the labrum, surrounds the socket, and this structure assists with shock absorption and stability.

Visualize the shoulder joint as a golf ball sitting on a tee. The shoulder capsule and ligaments form a layer of tissue adjacent to the ball and assist in holding the shoulder in position. Adjacent to these structures sits the rotator cuff, which attaches as a tendon to the front, top, and back of the ball. An empty sac, or bursa, sits between the rotator cuff and the shoulder blade to cushion and lubricate the motion between the two structures.

Rotator Cuff Injuries

If the small space between the rotator cuff and bone becomes inflamed due to over-exertion, the rotator cuff and overlying bursa are sometimes compressed, causing bursitis and tendonitis. This condition, called external impingement, occurs more often

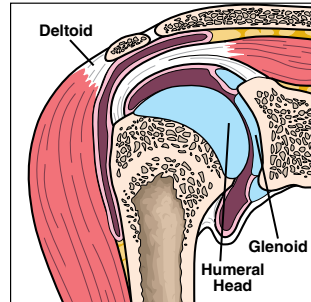


Figure 1: Viewing the shoulder from the front illustrates the deltoid muscle, labrum, and rotator cuff as the ball (humeral head) and socket (glenoid).

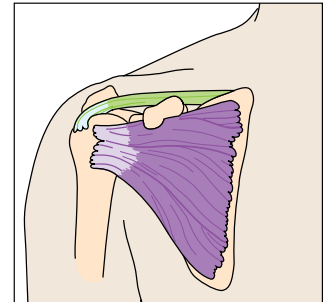


Figure 2: The rotator cuff tendons attach on the front, top, and back of the shoulder.

in the middle-aged and older patient population. Bone spurs, which can develop from years of use, may form on the undersurface of the shoulder blade and contribute to rotator cuff irritation by compressing or pinching the rotator cuff (impingement). Repetitive compression to the rotator cuff can lead to failure or tears in the tendon.

Weightlifting or trauma encountered in sports such as football or hockey may cause acute injuries to the rotator cuff. These injuries usually occur in younger patients and are less common than injuries from impingement. Some athletes may cause damage to their rotator cuffs from repetitive overhead motions.

Luckily, the majority of patients with rotator cuff damage respond well to anti-inflammatory drugs, physical therapy, and cortisone injections, either alone or in combination. Pain with overhead activity and pain at night are cardinal symptoms of rotator cuff damage. Non-surgical management may be attempted, but surgical repair is sometimes necessary. Several months of therapy helps restore range of motion to the shoulder.

Labral Injuries and Instability

Trauma to the shoulder may also lead to a feeling of looseness or instability.



Figure 3a: The rotator cuff tendon is torn from its native insertion on bone.



Figure 3b: A repaired rotator cuff is secured to its original position on bone.

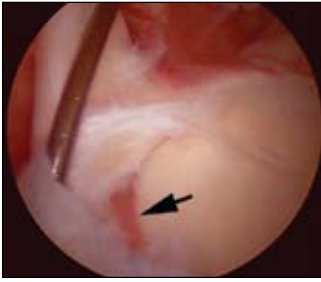


Figure 4a: A torn labrum is detached from its normal position on the glenoid.

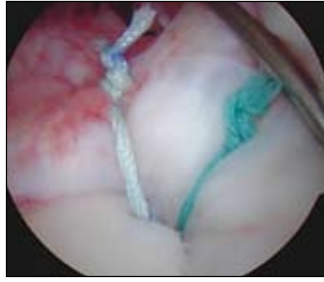


Figure 4b: A suture anchor reattaches the labrum.

Certain motions may cause the patient to feel as if the shoulder is “slipping” in and out of the joint. The feeling of instability results from damage to the internal structures, specifically the shoulder labrum (soft cartilage) and ligaments.

Injuries such as shoulder dislocations can damage the labrum and lead to recurrent instability. Repetitive overhead motions or falls may cause superior labral injuries (SLAP tears).

Another type of instability is often seen in athletes who participate in overhead sports, such as swimming and volleyball. This type of instability originates in the thin capsule covering the stretched shoulder and creates looseness in all directions (multidirectional instability).

Tests such as x-rays and magnetic resonance imaging (MRI) help diagnose these injuries.

Surgical reconstruction to repair the injured labrum or tighten a loose capsule is performed arthroscopically. Three or four small incisions minimize the soft tissue trauma to the shoulder while the damaged structures are repaired with the assistance of a camera (see Figure 4).

AC Joint Injuries

The collarbone joins the shoulder at the AC joint. The joint may become injured or develop arthritis. Acute injuries to this joint usually occur from direct force when a patient falls on the shoulder. The pain that follows is usually intense, and any motion tends to be uncomfortable. With blunt force, the two bones may separate. An x-ray identifies the degree of separation, and direct pressure over the joint confirms the diagnosis. Most injuries respond well to rest, ice, anti-inflammatory medications, and a sling for a short period of time. Occasionally, a largely separated AC joint will need surgical reconstruction.

The AC joint can also become arthritic from chronic wear and tear to the shoulder. This condition tends to present in

middle-aged or older patients. As the cartilage wears away, arthritis develops. Pain is often experienced while reaching across the body or directing pressure over the top of the shoulder. An x-ray will document the presence of arthritis at the AC joint. Anti-inflammatory drugs or cortisone injections may help. Surgical treatment, performed arthroscopically, removes the end of the arthritic collarbone, creating a new space or joint. Following rehabilitation, the patient should regain function without pain.

Arthritis

The loss of cartilage between the ball and socket may lead to shoulder arthritis. Most often it is attributed to long-term wear and tear. Sometimes, fractures or trauma may lead to the development of arthritis. Motion of the shoulder creates pain as the two bones, devoid of cartilage, come into contact as the shoulder rotates.

Initial treatments may include anti-inflammatory drugs, cortisone injections, or physical therapy. These treatments, although they do not remove the arthritis, may make the symptoms much more manageable. For symptoms that do not respond favorably, shoulder replacement is an option.

While shoulder replacements are not performed arthroscopically, improved instruments and techniques allow small or mini incisions to be used. Two types of shoulder replacements are available, which will depend on the rotator cuff's condition.

For an arthritic shoulder with a healthy rotator cuff, a traditional replacement with a new socket and ball on the humerus replicates the normal anatomy (see Figure 5). For an arthritic shoulder with a damaged rotator cuff, a “reverse” shoulder arthroplasty offers the best surgical solution. With a “reverse” shoulder arthroplasty, the surgical sphere is placed on the socket to prevent shoulder dislocation (see Figure 6). Shoulder replacements are often excellent procedures to relieve shoulder pain and also do a fairly good job in improving some range of motion. After three to four months of rehabilitation, most patients are able to return to their normal activities without pain.

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Aaron A. Bare, MD, earned his medical degree from Northwestern University Medical School and completed his surgical internship and orthopaedic surgery residency at Northwestern. Fellowship trained in sports medicine at the Southern California Orthopedic Institute in Los Angeles, Dr. Bare has treated a wide variety of amateur and professional athletes and specializes in comprehensive care of the shoulder and knee. Areas of expertise include knee and shoulder arthroscopy and replacement, advanced reconstruction of the shoulder, and hip arthroscopy. Dr. Bare is board eligible by the American Board of Orthopaedic Surgery and is a member of the American Orthopaedic Society for Sports Medicine, Arthroscopy Association of North America, and American Academy of Orthopaedic Surgeons.



Figure 5: A shoulder replacement for an arthritic shoulder with an intact rotator cuff is shown.



Figure 6: Without a functioning rotator cuff, the sphere resides on the socket (glenoid).