**Shoulder fractures**

Shoulder fractures (broken bones) often occur secondary to trauma, including but not limited to, athletic injuries, falls or motor vehicle accidents. These injuries can have a significant effect on one's ability to use the arm. Therefore, the treatment of these injuries require the caring aid of an upper extremity specialist. Treatment of these fractures can vary from immobilization with no need to put the bones back in perfect position to the need for surgery in order to reduce the bone into a more normal position for the shoulder to function. Unfortunately, the restoration of normal bone position does not insure normal function of the shoulder. Impairment of shoulder function may still be hampered by injuries to the shoulder muscles and ligaments. Your upper extremity specialist will help in the proper treatment options for these traumatic injuries.

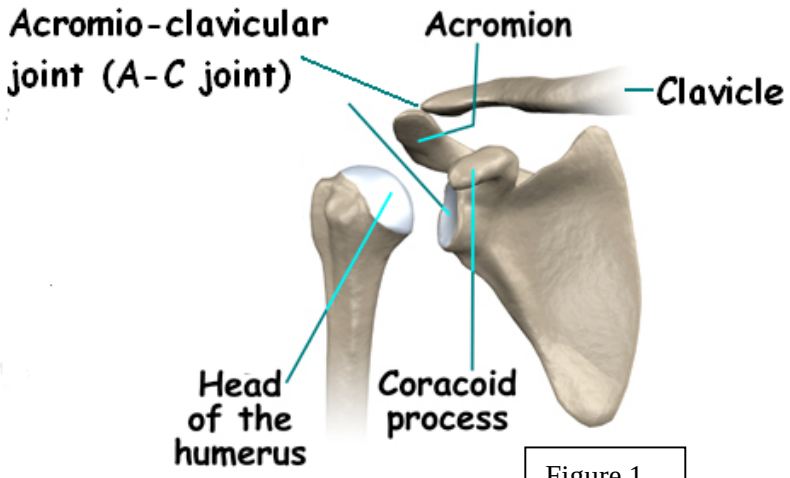


Figure 1

The shoulder is a joint suspended by many muscles surrounding the upper extremity. The only connection of the shoulder girdle to the remainder of the skeleton is

the clavicle. Disruption of these links can limit the ability to use the arm for activities such as athletics and work. The shoulder bones that can be involved include the clavicle (collarbone) the scapula (shoulder blade) and the humerus (upper arm bone). The scapula is an important part of the shoulder joint as it serves as an anchor for many muscles as well as the socket part of the shoulder joint itself (glenoid). The end of the humerus which articulates with the socket, serves as the ball part of the shoulder joint. This serves as an attachment source of many muscle tendon groups that are integral in shoulder function. One of the most important is the rotator cuff. Disruption of any of these functional units can create difficulty with the function of the shoulder.

Fractures about the shoulder vary amongst age groups. A majority of fractures in children occur in the clavicle with fifty percent of these injuries secondary to a fall while playing or from sports. In the older adolescent to older adult, one-third of fractures occur within the upper part of the arm, one-third involve the clavicle with a minority of injuries from dislocation of the shoulder joint. These commonly result from sports or motor vehicle accidents. In individuals older than sixty-five, a majority of fractures involve the proximal humerus commonly from a fall. [1]

**Clavicle Fractures**

This is the most common fracture about the shoulder. The frequent mechanism of injury is a fall onto the

Figure 2

[1] Nordquist, Peterson, et al., Journal of Shoulder and Elbow Surgery 4: 107-112, 1995.

shoulder. These fractures can be quite painful associated with difficulty in moving the arm. Classically, treatment has been non-operative in nature. It is commonly felt that even with displacement of the two fracture ends, this fracture will heal with minimal affect on shoulder function. Treatment can be a simple sling or a "figure 8" strap. The wearing of either of these can be from three to eight weeks depending on one's pain. With healing a bump may be notable over the fracture area which may decrease over time. A deformity may be a permanent residual. Range of motion can begin as soon as pain subsides; return to sports cannot occur until full shoulder strength returns. A delay in return to contact sports would be considered only when the fracture is fully healed on X-Ray. Recently, the surgical treatment of these fractures has been reconsidered. Surgical treatment options may include plates and screws or even a rod placed through the bone. The consideration for any of these treatment options may be dependent upon one's activity level and the dominance of arm use, i.e. a right-handed athlete with injury to the right clavicle versus an older individual not involved with "overhead" activities.

**Acromio-clavicular Joint (A-C Joint)/Shoulder Separation**

The Acromio-clavicular joint is the connection of the end of the clavicle to the

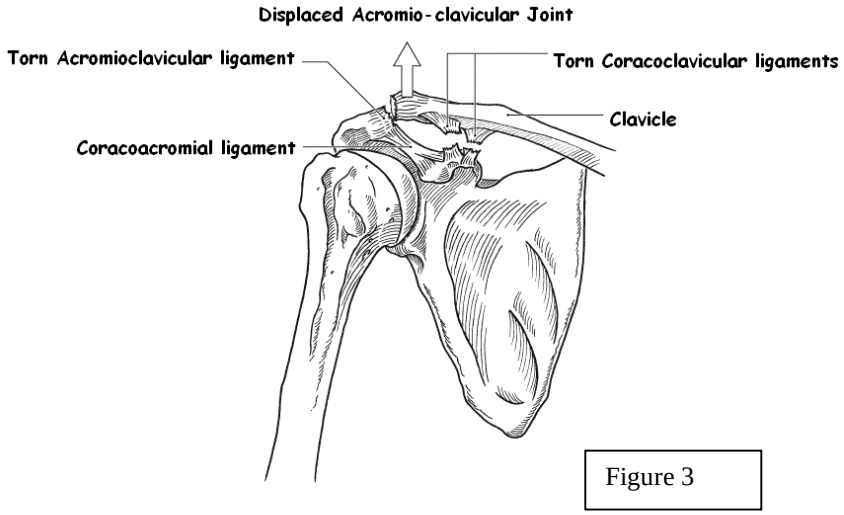


Figure 3

acromion - an extension of the scapula (Fig. 1). This occurs from a fall onto the shoulder. An injury to the supportive ligaments that stabilize the two bones are torn causing them to separate. *A ligament extends between two bones stabilizing the bones in position.* With the ligaments torn, the joint separates and becomes unstable (Fig.3). The arm is pulled downward by its own weight creating a bulge about the shoulder (Fig. 4). At times, these injuries may be associated with a fracture at the end of the clavicle which may change treatment options. The pain associated with this injury can vary from mild, with little deformity, to moderate/severe pain, with significant deformity to the shoulder.

Diagnosis of these conditions is with X-Ray evaluation and physical exam. In the absence of deformity, pain is present over the joint. Pain also may be associated with use of the arm overhead and across the body.

Figure 4

Treatment is often not operative. Use of a sling to support the arm is commonly used. It is not necessary to reduce the bones into position as most patients will return to near normal function even with residual deformity. Therefore, It is reasonable to treat this condition without surgery while waiting to see if pain becomes a chronic problem. In those rare instances, surgery may be helpful. When surgery is done, long after the injury, it often works just as well as if it were done at the time of the injury.

A return to activities is based on one's pain level. This may require the use of therapy to help restore motion and strength: the greater the deformity, the longer the recovery which can be from two to four weeks to months in length.

**Scapula – Shoulder Blade**

Fractures of this bone rarely occur. The most common mechanism is high energy trauma, i.e. motor vehicle accidents or a fall onto the back from a height. Diagnosis of the fracture is often made on X-Ray evaluation. At times more definition of the fracture may require a CT Scan to access the displacement of the fracture fragments. A CT Scan is a specialized X-Ray imaging study that the physician may order to assist in treatment considerations. Once the fracture is fully evaluated, the appropriate treatment plan will be established. This can be a simple sling for two to four weeks or the need for surgery. Surgery is often based upon an injury to the glenoid (shoulder socket) with displacement, the acromion or the neck of the scapula, the connection of the shoulder blade to the shoulder socket (Figure 1). A return to function is allowed when the bone is healed and strength and mobility is restored. This can be from six months to one year in length.

**Shoulder Joint Fractures/Proximal Humerus Fractures**

Fractures involving the upper part of the arm bone are more commonly seen in the older than the sixty-five year old population. These fractures occur from a fall onto the arm. In the younger population, these injuries can be simple fractures associated with dislocations of the shoulder joint (Fig. 5). In those instances, the fracture is often treated with the shoulder joint being put back into place, i.e. reduced. If X-Ray evaluation demonstrates the fracture to be in good

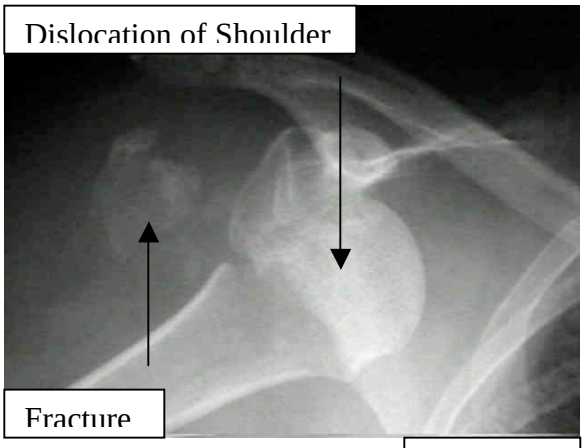

Figure 5

position, sling immobilization is often the treatment of choice. If the fracture is out of position, surgery may be recommended.

For the older population, a fracture in the upper arm can result in two situations: 1) may be where there is no significant displacement of the bone fragments or 2) the fragments of the fracture are displaced by at least 2cm or angled more than forty-five degrees in relation to one another. Treatment of the non-displaced fractures can be with a sling for four weeks after which motion can be started. Recovery may require the use of physical therapy to assist in improving motion and strength. For those fractures with displacement, surgery may be the best treatment option.

Figure 6

Surgery can be either a repair of the fracture with varied types of fixation; plates, screws and wire may be used at the discretion of the surgeon (Fig. 6) When the fracture involves multiple parts of the proximal humerus and humeral head, a shoulder replacement may be necessary (Fig.1, 7).

Recovery from these injuries often leave one with shoulder stiffness regardless of how well the bone was reconstructed or joint replacement performed. This is secondary to the associated injuries about the shoulder to the muscle-tendon units as well as the ligament structures. With any injury about the shoulder, there are often many different treatment options. Whichever one is chosen to treat your injury, the recovery can be

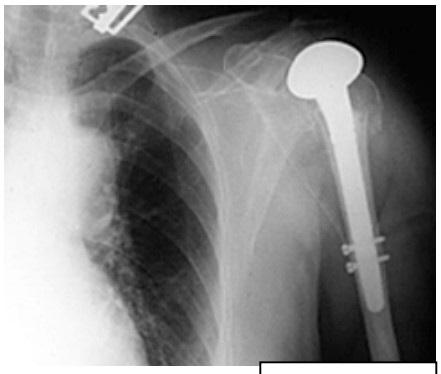

Figure 7

arduous and prolonged.  Formal therapy and home exercises are a mainstay of recovery. Your upper extremity specialist will be able to help guide you through to your best end result.