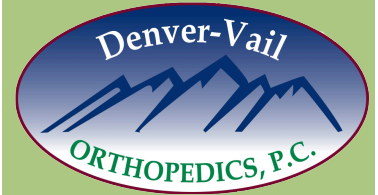
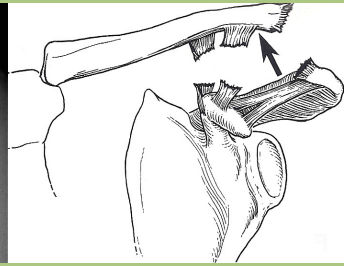


AC Joint Sprains/Separation



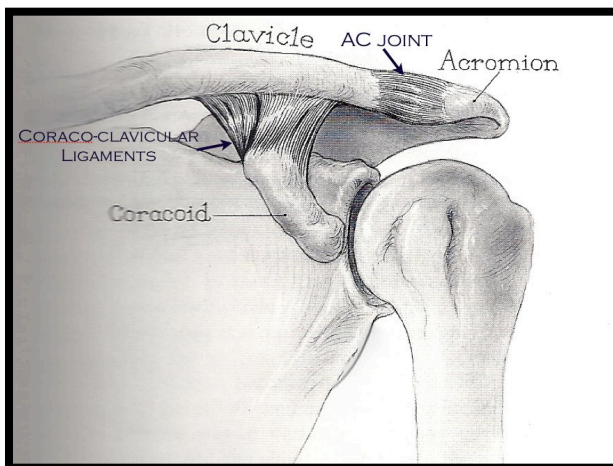
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Acromioclavicular (AC) joint injuries represent 40% to 50% of athletic shoulder injuries. The treatment of these injuries has been somewhat controversial. Treatment ranges from nonsurgical symptomatic treatment to repair and/or reconstruction of the torn ligaments.

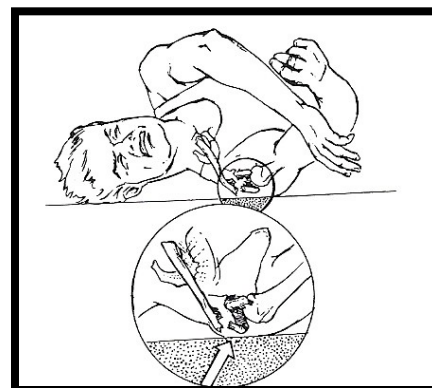
The acromioclavicular joint is formed from the articulation of the lateral aspect of the clavicle (collarbone) and the medial aspect of the acromion (roof of the shoulder). The clavicle is the attachment of the arm to trunk of the body and the AC joint is the articulation of the scapula (shoulder blade) to the

the clavicle. Because the clavicle is the one bone that attaches the arm to the rest of the body there is a significant amount of load that is placed on both the clavicle and the AC joint in the resting position (arm at side) or with movement. When a significant load is placed on the arm or the shoulder this force will be transmitted to the clavicle and/or the AC joint and may result with either a clavicle fracture or the ligaments will tear resulting in an AC joint injury (separation).



Injury to the AC joint

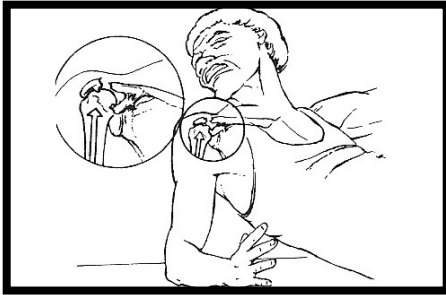
An injury to the AC joint can occur through a direct or an indirect mechanism.



Direct injury results from a force to the top part of the shoulder pushing the acromion down while the clavicle is held

clavicle. As the arm is moved there is some rotation through this joint. The AC joint is stabilized by the acromioclavicular ligaments which attach the clavicle and the acromion (part of the scapula/shoulder blade). The scapula is also attached to the clavicle through the coraco-clavicular ligaments which attach to the coracoid (part of the scapula) and

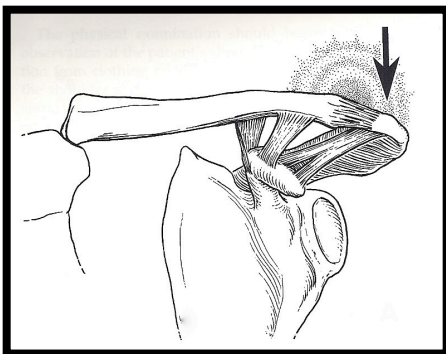
in its normal position. The initial stress is placed on the acromioclavicular ligaments and as the load is increased more stress is then placed on the coraco-clavicular ligaments. An indirect injury occurs when a load is



placed on the elbow with a superiorly directed force that pushes the shoulder upwards placing load on the acromioclavicular ligaments.

Classification of AC joint injuries

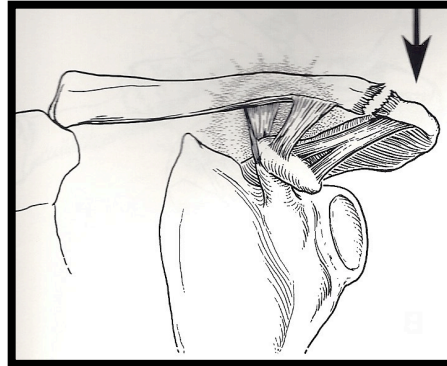
The degree of injury to the AC joint is dependent on the amount of energy transferred to the acromion, the clavicle, as well as the ligamentous structures. Injuries are classified from type I



through type VI. In type I injuries there is no visible deformity, however, there may be some swelling and tenderness over the AC joint. There is no tenderness at

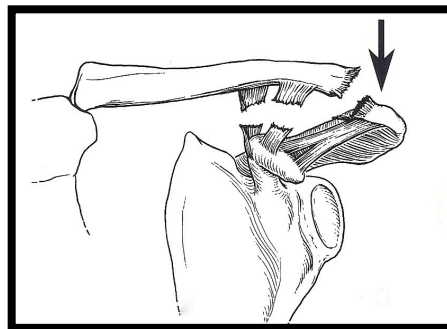
the CC (coraco-clavicular) interspace. Radiographs will appear normal.

In type II injuries there is some deformity at the AC joint and on physical exam there is tenderness and there may be some instability



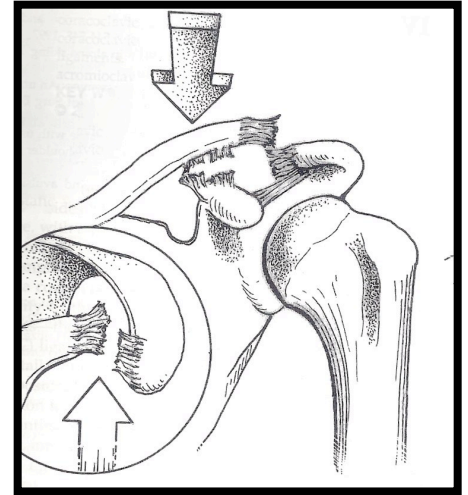
of the distal clavicle. Radiographs reveal widening of the AC joint with some mild vertical displacement of the distal clavicle.

Type III injuries reveal greater deformity (bump) at the AC joint with significant tenderness to palpation. There will also be tenderness along the coraco-



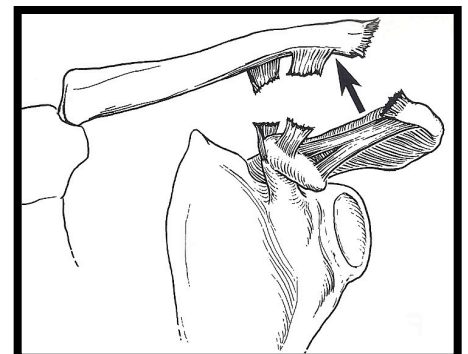
clavicular ligaments. The AC joint is reducible by an upward force placed on the elbow and a downward force on the clavicle. Radiographs reveal a complete separation of the distal clavicle and the acromion.

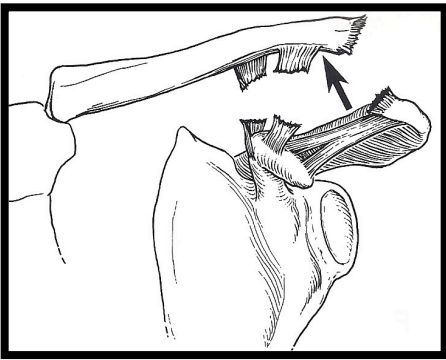
Type IV injuries have very similar findings to type III injuries on physical exam, however, the distal clavicle will be displaced more posteriorly (towards the back). If a reduction maneuver is attempted the joint will not be able to be



reduced. Radiographs reveal complete displacement of the clavicle on the AP (anterior, front) view while on the axillary (armpit) view the end of the clavicle will be displaced posteriorly.

Type V injuries are injuries that are more significantly displaced than type III injuries. On physical exam there will be more displacement of the distal clavicle and it may tent the skin. In this injury not only are the ligaments torn but the end of the clavicle will tear through muscle and





fascia and be very superficial. If a reduction is attempted it will be unsuccessful. Radiographs will reveal displacement of 100 to 300% of the distal clavicle.

Type VI injuries are very uncommon. Unlike the other injuries where the clavicle is superiorly displaced, in this injury the clavicle is inferiorly displaced under a portion of the scapula (shoulder blade), the coracoid.

Treatment

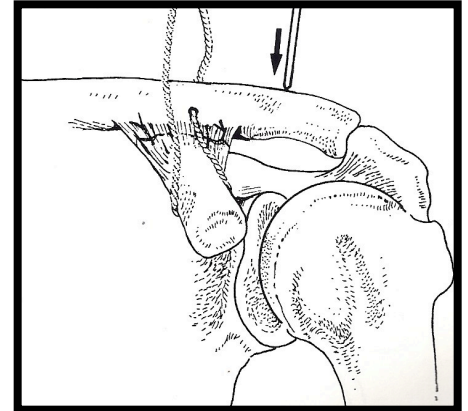
Nonsurgical symptomatic treatment is uniformly recommended for type I and type II injuries. Initially this includes a sling for comfort as well as medications. In the acute phase narcotic medications can be used as well as anti-inflammatories. Ice over the injury may also help with pain and swelling. Usually the sling is used for 7 to 10 days or until the pain subsides. Once the shoulder pain has subsided range of motion is initiated. After a painless range of motion is obtained, gentle strengthening can be started full activities can gradually be resumed. Contact sports and heavy lifting should be

avoided for the first 6 to 10 weeks following the injury.

The treatment for type III injuries (complete displacement) is more controversial. Most studies support nonsurgical management of these injuries in recreational as well as high-performance athletes. In one review of multiple studies, it was concluded that patients treated nonsurgically returned to work to pre-injury activities sooner and had more nearly normal strength and range of motion. Patients treated surgically had a higher complication rate. In another study it was determined that laborers and athletes can recover adequate strength and endurance with nonsurgical treatment despite a slight decrease in both measures. Adequate rehabilitation is important to a successful nonsurgical outcome. In a rehabilitation study, it revealed that those patients who received therapy did not have any disability. If symptoms develop after several months of nonsurgical treatment then surgery may be an option.

Surgical management is usually reserved for type IV, type V and type VI injuries. The goal of surgical management is to repair or reconstruct the coraco-clavicular ligaments reducing the AC joint. There are many different surgical procedures that have been described and used and all have their proponents.

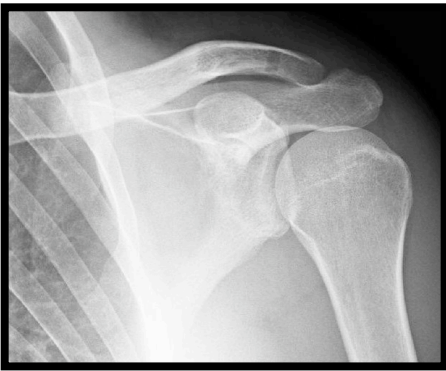
The surgical procedure that I perform involves repair and reconstruction of the coraco-clavicular ligaments. At the time of surgery the coraco-clavicular ligaments are identified and multiple sutures are used to bring



these together. Because the ligaments are usually significantly damaged this repair must be augmented. Therefore at the time of surgery a suture and a tendon allograft are placed around the coracoid and through the clavicle and tied to reduce the clavicle and



approximate the ligaments. The augment will support and protect the coraco-clavicular ligaments while they heal. The tendon graft will provide biologic support for



the long term success. At the time of surgery a portion of the distal clavicle is resected (5-7 mm) to reduce the risk of future arthritis in the AC joint.

Postoperatively the arm is placed in the sling for approximately 4 weeks. The arm can be removed from the sling for light activities such as driving, computer work and activities with the arm at the side. Between four and six weeks after the surgery light activities can be initiated and at eight weeks one can gradually return to normal activities except for contact activities. At 4 to 6 months following surgery all activities can be resumed.

The surgery has a 85-90% success rate of obtaining and maintaining a reduction. The risk of arthritis at the AC joint is very low as the distal clavicle is resected, and pain relief is very predicable.

If you have questions concerning this or other orthopedic conditions please visit my website www.davidostermd.com.