

# What's the Latest on AC Joint Injuries?

A fall onto the tip of the shoulder can disrupt the ligaments and capsule holding the *acromioclavicular* (AC) joint together. The result can be a dislocation of the AC joint. Sometimes this injury is referred to as a *shoulder separation*. The AC joint is located where the end of the *clavicle* (collar bone) meets the *acromion*. The acromion is a curved bone that comes from the shoulder blade across the top of the shoulder.

The AC joint is fairly complex with its many ligaments and strong capsule holding everything together. Damage to any of these soft tissues can be severe enough to require a surgical repair. Deciding when to do surgery and what type of surgery is the focus of this article.

Besides landing on the tip of the shoulder with enough force to disrupt the AC joint, there are two other ways this joint can be damaged. One is to fall onto an outstretched arm and hand with enough force up through the arm to dislocate the joint.

The other is through a fracture at the base of the *coracoid process*. The coracoid process is a piece of bone along the inside of the shoulder blade that forms a triangle with the acromion and the clavicle. The ligaments between these three structures are what form a strong and stable AC joint.

Treatment for AC joint injuries is usually based on the severity of the damage done to bone, ligaments, capsule, and nearby muscles. AC joint injuries are broken down into six categories classified as I through VI (from mild sprain to severe dislocation). The joint can be unstable in one of three directions: front and back (anterior-posterior), side-to-side, and vertical (up and down).

A *type I* injury means there's no visible injury. The patient may have some swelling and tenderness right over the AC joint (front of the shoulder), but X-rays and motion are normal. A *type II* injury results in pain over the AC joint and positive findings on an X-ray (widening of the AC joint space). Sometimes there's vertical instability but not often. Types I and II AC joint injuries are treated conservatively (without surgery).

Vertical (up and down) movement of the clavicle is more common with *type III* injuries. X-rays show the joint is dislocated. The acromion is separated from and slightly above the clavicle. Pushing up on the elbow puts the joint back together. But it may not stay there, which is a sign of instability.

Surgeons have the most difficulty in deciding about surgery for Type III injuries. The loss of contact between the clavicle and the acromion means that motion is going to be altered. If a rehab program isn't enough to successfully treat this injury, then surgery is done to reconstruct the joint.

Sometimes individual patient demands require surgery early on. And in the case of a chronically dislocating AC joint, surgical intervention may be the only way to restore full, normal stability and movement. Overhead athletes and heavy manual laborers seem to fall into this group most often. And there's some question that maybe patients with type III injuries fail because they didn't complete their rehab program or the rehab program wasn't quite enough. The shoulder can function normally without an intact clavicle. But it cannot do so when the shoulder muscles are weak and unable to stabilize the joint.

Types IV, V, and VI injuries are more severe. The AC joint becomes unstable and surgery is almost always necessary. The ligaments are disrupted and the joint is dislocated. In the most severe cases (Type VI), the muscles are detached from the clavicle. The joint can't be put back in place and the nerves can be stretched leading to nerve palsy. When the injury (usually a Type VI) is caused by a high-energy trauma, there can be

broken bones as well (e.g., clavicle, ribs).

Diagnosis and classification is based on the history (what happened or mechanism of injury), clinical presentation (patient's symptoms and results of clinical tests), and findings on X-rays and CT scans.

Typical symptoms include local pain, tenderness, and swelling. There may be bruising and an obvious deformity when the joint is dislocated or a bone is broken.

What the examiner sees visually may depend on the degree of joint separation and direction of disruption. The pain is made worse by moving the arm away from the body or across the chest. Type III injuries are the only ones that can be *reduced* (put back in place). There isn't displacement with Types I or II and Types IV through VI are dislocated too severely. The imaging studies help confirm the severity of the injury.

Once the diagnosis is made, then a plan of care is determined. Stress is removed from the joint during the acute phase (first 10 to 14 days) when there is a Type I or II injury. The patient wears a sling or shoulder immobilizer. When the pain is mild or gone, gentle exercises can be done. A Physical Therapist guides the patient through a rehab program to restore motion, strength, and endurance.

Heavy lifting and contact sports aren't allowed until the ligaments have healed. This can take up to three months. Early return to these kinds of activities can cause a Type II injury to become Type III or a Type III injury to convert to a complete rupture (Type IV or worse).

Not all patients recover completely from Type I and II injuries. There may be some long-term symptoms such as clicking and pain or limitations with certain activities (e.g., push-ups). Studies have been done comparing patients with more severe injuries who were treated conservatively versus those who had surgery. The severity of the dislocation was judged based on how far apart the joint had separated. Patients with more than a two centimeter separation were placed in the group labeled *severe*.

Only a small portion (20 per cent) of the severe group treated conservatively had good-to-excellent results. This was compared with those patients who went ahead and had the surgery. Surgical repair resulted in 70 per cent success.

The authors sum things up about treatment by saying that low-grade, minor AC injuries are still treated these days with conservative care. More severe injuries are treated surgically. There's always a chance of arthritis developing in either group. And patients treated nonoperatively can develop chronic instability.

That brings us to the final area of review in this study and that is: what kind of surgery has the best results? The surgeon must decide what technique to use and then plan the method to accomplish the task. Of course, the goal is to realign the AC joint. There is agreement that types IV, V, VI, and some type IIIs need surgical intervention, but that's about as far as it goes. There isn't much consensus on what type of surgery to do.

For example, if the main AC joint needs to be held together (a technique called *fixation*), should the surgeon use wires or a hook-plate? If fixation is needed between the coracoid process and the clavicle, then which is better: a screw or a suture loop?

And if the damage is severe enough to require ligament reconstruction, which muscle/tendon does the graft tendon come from (e.g., hamstring, anterior tibialis)? In some cases, the end of the clavicle is *excised* or removed altogether. Studies have called this practice into question. Future studies are needed to look at the success/failure of this technique before continuing to use it.

The authors review each surgical approach and describe both the techniques used and the pros and cons of each one. Complications following surgery seem to be related to the surgical technique used. Sometimes the hardware used for fixation breaks and moves causing damage to nearby nerves or blood vessels. The body may react to the fixation devices as if it were a foreign object to get rid of. Infection is always a danger.

Drawings, X-rays of screw placement, and photos taken during open surgery are provided to help surgeons see the steps needed to complete the reconstruction procedure. The importance of postoperative rehabilitation is emphasized. Immobility with the application of cold during the first few days is advised. Motion is allowed after two weeks with some restrictions.

Nothing heavier than five pounds may be lifted until the hardware is removed. Then full motion and a strengthening program can be added. Some differences in rehab are needed when ligament reconstruction is part of the procedure. The healing graft must not be disturbed in order to assure complete recovery. When it's all said and done and full motion and strength have returned, then the patient can return to work or sports activities without restrictions.

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