



# Isolated acromioclavicular osteoarthritis and steroid injection

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The acromioclavicular (AC) joint is a diarthrodial plane synovial joint that aids in raising the arm over the head and rotates minimally in all directions [1]. The AC joint is conspicuously smaller than the glenohumeral joint and is referred to as the forgotten joint [2]. Primary osteoarthritic change of the AC joint is a common degenerative change typically seen in middle-aged or elderly patients [3]. But secondary osteoarthritis, mainly following traumas such as joint sprains or distal clavicular fractures, appears to be even more common than primary osteoarthritis [4].

A study found that 54%–57% of elderly patients had X-ray evidence of degenerative changes in the AC joint [5]. Magnetic resonance imaging (MRI) is the most powerful diagnostic tool for detecting osteoarthritic change in the AC joint [6].

There are many parameters for describing AC joint osteoarthritis (ACJOA) in an image. Joo et al. [7] said that the cross-sectional area of the AC joint seems to be a sensitive image parameter for ACJOA. However, some authors believe that image results have a poor correlation with clinical symptoms. Rajagopalan et al. [8] claimed that MRI characteristics in ACJOA are so prevalent that they can be considered a universal aspect of human aging, but imaging cannot be used as a reference standard to assess the reliability and accuracy of various symptoms and signs for diagnosis of symptomatic ACJOA.

Symptomatic ACJOA is a relatively easy diagnosis clinically, presenting as pain localized at the lateral end of the clavicle that is exacerbated with cross-body adduction or with active contraction of the pectoralis major. In cases where differential diagnosis is difficult, local anesthetic injection into the AC joint or sub-

acromial bursa can be helpful.

Conservative therapy is the first option for shoulder pain caused by ACJOA, while surgical therapy, whether open or arthroscopic, is reserved only for patients who do not improve with conservative therapy [9]. Nonsteroidal anti-inflammatory medication and injections are commonly used modalities for conservative treatment of ACJOA or other joint diseases. The agent used for (intra-articular) injection include steroids, hyaluronic acid, and mesenchymal stem cells [10,11]. Steroid injection shows good short-term results but relatively poor mid- and long-term outcomes. Thus, it remains unclear which site should be targeted for the steroid injection to achieve good clinical outcomes in ACJOA.

For frozen shoulder, there are reports suggesting no significant difference in clinical outcomes between subacromial space and intra-articular injections [12,13]. This is explained by the location of the pathology causing symptoms. A meta-analysis about wrist joints has suggested that the variability in clinical outcomes after steroid injections might be due to inclusion of cases where the steroid was unintentionally injected in extra-articular space [14]. Katt et al. [15] reported that intra-articular injections into the carpometacarpal joint guided by fluoroscopy demonstrated superior pain reduction and functional improvement compared to extra-articular injections.

No conclusive correlation has been demonstrated between imaging findings and symptoms in ACJOA, and current understanding of the precise pathology underlying ACJOA remains limited. We report more favorable clinical outcomes than other studies by accurately administering steroids into the intra-artic-

Received: April 29, 2023    Revised: May 2, 2023    Accepted: May 2, 2000

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ular space under ultrasound-guided injection in only ACJOA patients.

Such findings after accurate injections facilitated by technologies such as ultrasound are expected not only to contribute to a better understanding of ACJOA, but also to enhance clinical outcomes. Additional research is needed to determine the main cause of pain in isolated ACJOA and the diagnostic methods to confirm it and to compare the clinical outcomes of intra-articular and extra-articular injection in ACJOA.

## NOTES

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### Author contributions

None.

### Conflict of interest

None.

### Funding

None.

### Data availability

None.

### Acknowledgments

None.

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