

## Ultrasound Guided Shoulder Injections

### Yong Cheol Jun

Department Orthopaedic surgery, Pride Hospital, Asan City,  
460, Hoseo-ro, Baebang-eup, South Korea

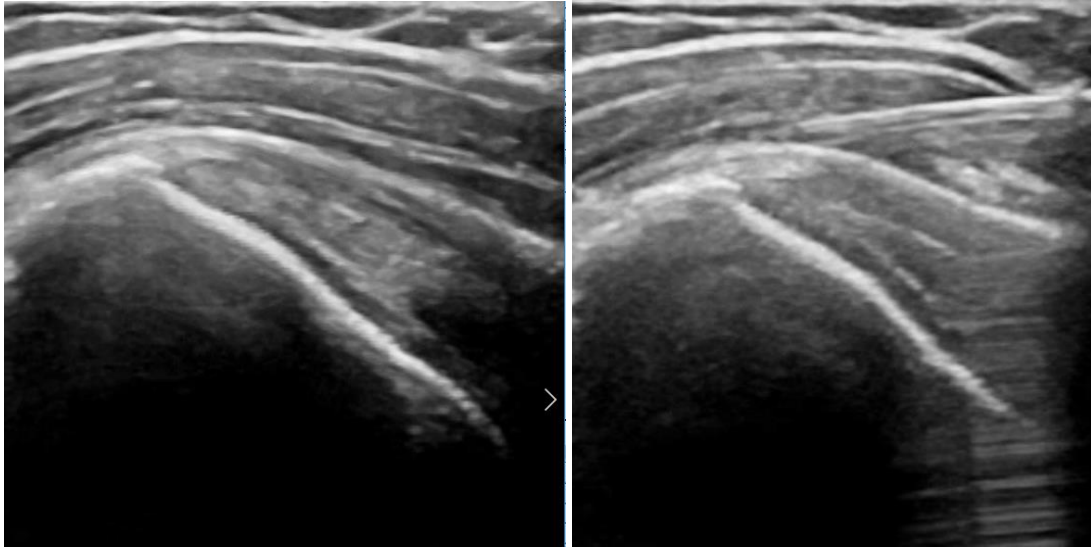
### Abstract

Injections around the shoulder girdle are some of the most popular procedures referred for and performed. The rationale for their use is increasingly under scrutiny, and quite rightly in light of some of the potentially negative effects of steroid on tissue. They also are often best performed as part of a comprehensive package of treatment including other approaches. They do however have a role to play for some patients, and some conditions, and we have therefore outlined some of the key techniques which we utilize in our practice.

### Subacromial Subdeltoid Bursa Injection

Bursitis, one of the representative shoulder joint pains, can be observed as thickening on ultrasound,

and in severe cases, swelling and water accumulation in the bursa located just above the supraspinatus muscle. It is located below the acromion, above the greater tuberosity, and is also called the subdeltoid bursa because it is located just below the deltoid muscle. The subdeltoid bursa is a dark, hypoechoic space between two layers of hyperechoic peribursal fat layers, and can be diagnosed as bursitis when the thickness is normal up to 2 mm or more.<sup>1,2</sup>). The upper ultrasound image shows swelling in the subdeltoid bursa, and the injection needle is positioned downward, making it easy to inject the injection.



### Supraspinatus Tendon Injection

The picture above is the basic position for a supraspinatus ultrasound examination. The second layer in the picture above is the course of the supraspinatus muscle. The lowest layer is a cross-section showing the greater tuberosity. If you know this layered anatomy when looking at an ultrasound,

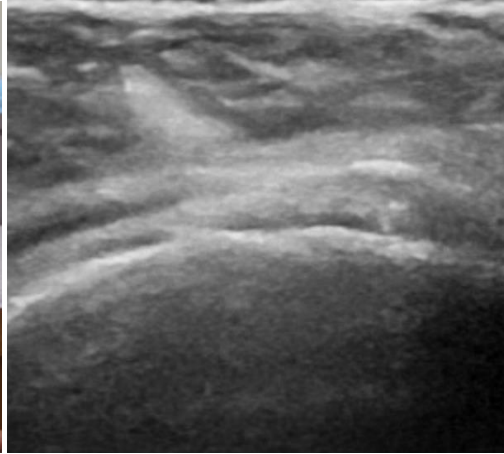
it will be very helpful in understanding the next steps. 3) Insert the injection needle in line with the direction of the probe while the shoulder joint is internally rotated and extended (Crass position). At this time, the high-intensity injection needle is clearly visible. Of course, the direction of the needle can also be seen.



### Infraspinatus Tendon Injection

The appearance of the infraspinatus muscle in this cross-section is normal. It shows overall continuity and there is no surrounding inflammation. Injection

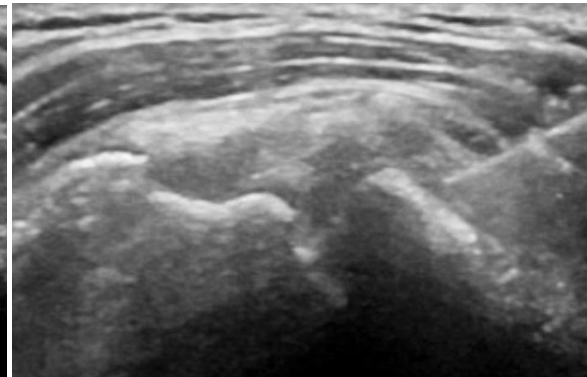
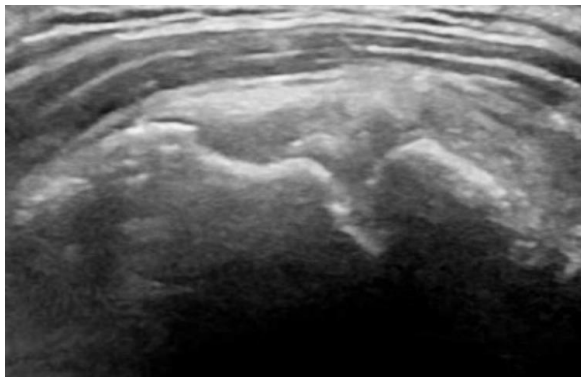
therapy of the infraspinatus muscle is effective for muscle strain and posterior joint capsule construction. The following findings are visible and injection is performed according to the direction of the tragus.



### **Calcific Tendinitis Injection**

Not all cases of calcific tendonitis have symptoms. About 30% are known to have symptomatic calcific tendonitis. In calcific tendonitis, multiple injections are performed using a 21-gauge needle into areas that

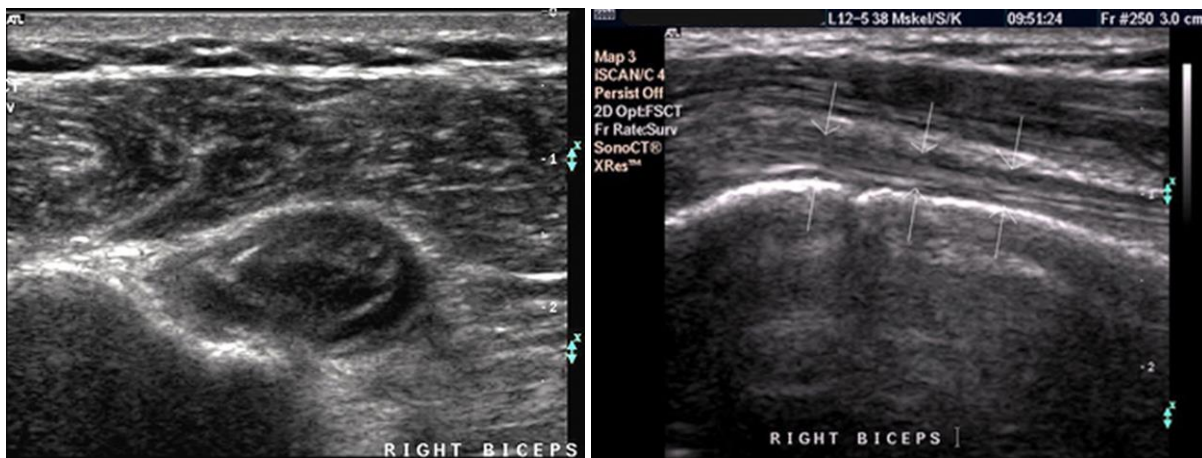
are calcified and have a clear reflection of ultrasound, making them appear white. Of course, the principle is to not inject into the rotator cuff itself, as this can protect tendons that are likely to be partially damaged.



### **Biceps Long Head Tenosynovitis Injection**

The long head of the biceps brachii is located between the supraspinatus and subscapularis and can be seen in the superior aspect of the joint between the rotator cuff muscles. It is involved in the flexion of the shoulder and elbow joints. In particular, the intraarticular attachment of this structure is involved in the stability of the shoulder joint. The long head of

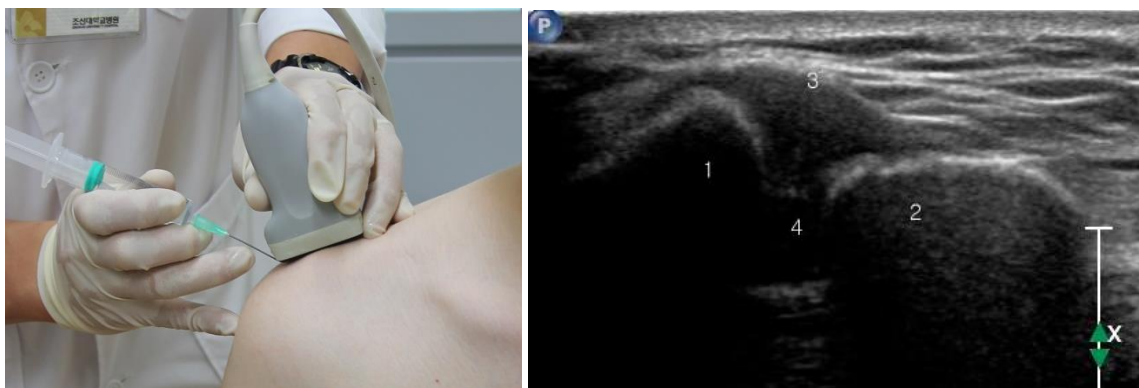
the biceps brachii passes through the groove for the biceps brachii of the humerus, and partial damage to this area can cause severe pain in the shoulder joint. The following figure shows the ultrasound findings along the course of the biceps brachii. The injection is injected while performing a longitudinal or transverse section examination.



### **Acromioclavicular Joint Injection**

It is difficult to conclude that abnormal findings in simple X-ray or ultrasound findings of the acromioclavicular joint necessarily cause symptoms or have a disease. If symptoms are clear, injection therapy can be performed after confirmation by ultrasound. The most protruding part above the shoulder is the lateral end of the clavicle, and the

acromioclavicular joint is located just lateral to this point. If the probe is inserted medially and lateral to this point, a longitudinal cross-sectional image of the acromioclavicular joint is observed. When the acromion and clavicle are observed in the center of the screen, the angle of the probe is adjusted to perform the examination at the angle where the bone is most highly echogenic.

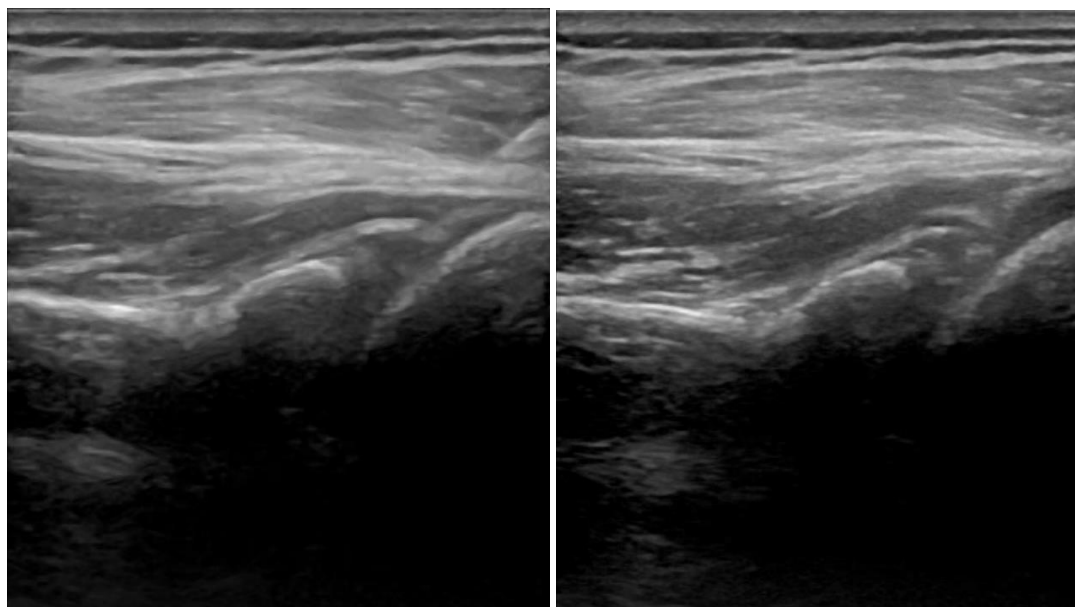


Longitudinal cross-sectional image of the acromioclavicular joint  
 (1. Clavicle 2. Acromion 3. Joint capsule 4. Joint space)

### **Glenohumeral Joint Injection**

Adhesive capsulitis of the shoulder joint is a disease that causes limited joint movement and pain, and hypertrophy of the joint capsule and synovium is mainly observed. Steroids and proliferative agents work to improve pain and joint movement, and steroids shorten the period of pain. That is, intra-articular steroids, when used in the early stage of the disease, restore the shoulder joint pain-free within 6 weeks, and in the freezing stage, reduce pain at night and during rest, so they cause chemical ablation of

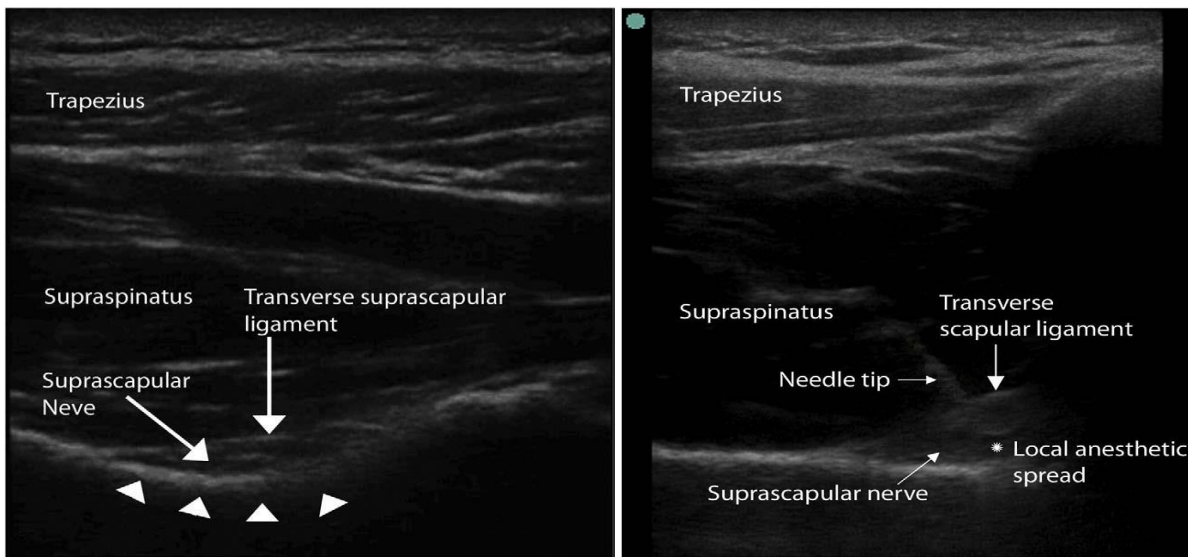
the area with early capsulitis, inhibit fibrosis in the synovium and joint capsule, and have the effect of shortening the natural course of the disease<sup>6)</sup>. After obtaining an image of the shoulder joint from the posterior side, insert a needle in-plane from the lateral to the medial direction of the probe, targeting the area between the posterior labrum and the humeral head. Afterwards, the drug can be confirmed to spread within the joint cavity through ultrasound when the injection is injected.



### Suprascapular Nerve Block Injection

The sensory branches of the suprascapular nerve spread over the scapula, the acromioclavicular joint, and 70% of the upper and posterior parts of the shoulder joint. 4) The suprascapular nerve is known to be involved in many areas when shoulder pain occurs, and suprascapular nerve block has been introduced in many literatures as an effective treatment for pain around the shoulder joint.<sup>1,5</sup> Suprascapular nerve block is also often performed

during arthroscopic surgery for postoperative pain control. 6) After confirming the suprascapular notch and the transverse suprascapular ligament overlying it using a probe, the mixed 10 cc solution is inserted at a 45-50 degree angle using a 6 cm long 23 G injection needle while being level with the probe. After confirming that the tip of the needle is located within the notch, injection therapy can be safely performed.



### Axillary Nerve Block Injection

Since the axillary nerve also controls the shoulder joint, it is a method that can be performed in cases where pain is not well controlled with suprascapular nerve block alone, and is effective in relieving pain at the attachment site of the deltoid muscle of the shoulder joint. The axillary nerve originates from the C5, C6 nerve roots, passes through the quadrangular space

between the teres major and teres minor, and proceeds to the posterior aspect. If the probe is placed in a longitudinal plane about 2 cm distally from the posterior angle of the acromion parallel to the humerus long axis, the pulsation of the teres minor tendon and the posterior humeral circumflex artery running distally can be confirmed. Injection can be performed in the in-plane manner targeting this area.



### **Citation of this Article**

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