



Point/Counterpoint

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Is Ultrasound Guidance Needed for Shoulder Injections?

CASE SCENARIO

MJ is a 44-year-old teacher who has had right lateral shoulder pain for 5 weeks. The pain developed acutely after he played a pickup game of basketball. He initially presented to his primary care physician, who suspected an acute rotator cuff injury and prescribed naproxen, 500 mg twice daily, along with physical therapy. MJ has completed 4 weeks of appropriate therapy focusing on scapular retraction exercise, pectoralis stretching, and rotator cuff strengthening. He experienced no relief from the therapy or medication, so his primary care physician obtained a shoulder magnetic resonance (MR) arthrogram, which demonstrated thickening of the subacromial-subdeltoid bursa, suggestive of bursitis, and a type I superior labral anterior to posterior (SLAP) lesion. MJ was sent to you for further evaluation and treatment. He currently has a 7 out of 10 level of pain over the anterolateral shoulder that is worse when he performs overhead maneuvers and sleeps on his right side. Upon physical examination he has no tenderness to palpation but experiences pain during active range of motion testing, particularly with internal rotation and abduction, respectively. He also has a positive Hawkins-Kennedy test, Neer sign, and O'Brien test. He has difficulty deciding whether his characteristic pain is reproduced more by the impingement maneuvers or labral maneuver. Neurovascularly, he is intact. You discuss treatment options, and given the failure of conservative treatments thus far, he wishes to pursue a corticosteroid injection in the subacromial bursa. He recently saw a commercial on TV featuring an injection that was performed with ultrasound guidance and asks if ultrasound guidance should be used to perform his injection. Dr Jonathan Finnoff will argue that ultrasound guidance should be used for the injection, and Dr John Costouros will argue that ultrasound guidance is not needed.

Jonathan T. Finnoff, DO

This scenario is not uncommon. Several important factors must be considered when determining what to do next. First, because several commonly used treatments have failed, one needs to consider whether the working diagnosis is correct. In this case, the patient's physical examination and MR arthrogram suggest 2 possible causes for the pain, namely subacromial-subdeltoid bursopathy or labral disease. However, it is not known whether one or both of these conditions are responsible for this patient's pain.

It is well known that many shoulder physical examination maneuvers have limited sensitivity and specificity. A recent meta-analysis found the pooled sensitivity and specificity for the Neer sign to be 72% and 60%, respectively, and the sensitivity and specificity of the Hawkins-Kennedy test was 79% and 59%, respectively [1]. Another systematic review concluded that

physical examination tests for SLAP tears were invalid and of limited clinical value [2]. Furthermore, multiple studies have established that patients can have pathologic findings on magnetic resonance imaging (MRI) with no associated symptoms [3-5]. Therefore, based on the available information, it can be concluded that the mechanism generating the patient's pain is not known with any type of surety. Because the treatment for labral disease is very different from that for subacromial-subdeltoid bursopathy, the first thing that needs to be done is to determine what is causing the patient's pain.

One way to determine what is causing the patient's pain is to perform diagnostic injections. A diagnostic injection involves guiding a needle to a specific structure and injecting a local anesthetic into the structure (in the case of a joint or bursa) or around the structure

(in the case of a nerve). If the patient's symptoms are relieved for the duration of the local anesthetic, it can be concluded that the structure that was anesthetized during the procedure is generating the pain. However, the ability to gain diagnostic information from an injection is predicated upon placing the medication in a specific location. In other words, the injection needs to be accurate or it doesn't provide any diagnostic information. Ten studies with level 1 or 2 evidence have been performed to evaluate the accuracy of landmark-guided (LMG) subacromial-subdeltoid bursa injections and have concluded that the mean accuracy is 80% [6-15]. Authors of a study with level 1 evidence reported that the accuracy of ultrasound-guided (USG) subacromial-subdeltoid bursa injections was 100% [12]. Therefore, based on the available evidence, to gain diagnostic information, the injection should be performed under ultrasound guidance rather than landmark guidance.

Although one of the primary goals of the subacromial-subdeltoid bursa injection in this case is to gain diagnostic information, it would also be advantageous for the injection to provide therapeutic benefit to the patient. Therefore, injection efficacy is of significant importance. Five level 2 studies have compared the efficacy of USG and LMG subacromial-subdeltoid bursa injections [16-20]. All 5 studies demonstrated better outcomes after USG subacromial-subdeltoid bursa injections than after LMG injections. Therefore, to provide the patient with the best outcome, a USG rather than an LMG injection should be performed.

Finally, 4 studies to date have compared the cost-effectiveness of USG versus LMG injections [21-24]. All 4 studies concluded that USG injections were more cost-effective than LMG injections. Although none of the studies specifically evaluated the cost-effectiveness of USG versus LMG subacromial-subdeltoid bursa injections, the current evidence suggests that USG injections are more cost-effective than LMG injections.

In conclusion, to provide the patient with diagnostic information, better outcomes, and lower medical costs, I would recommend proceeding with a USG rather than an LMG injection.

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