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### A new and simplified approach to target the suprascapular nerve with ultrasound

To the Editor:

As was described in a recent review article on the suprascapular nerve, this nerve receives sensory input from the glenohumeral and acromioclavicular joints, rotator cuff, and posterior two thirds of the capsule of the shoulder joint. The suprascapular nerve is a popular target for surgical and acute pain as well as chronic shoulder pain [1]. A recent randomized, blinded study showed superior patient satisfaction with a suprascapular nerve block when compared with placebo or subacromial infiltration with local anesthetic [2]. In addition to single injections, continuous infusions with catheter techniques also have been described with good results [3-6]. The suprascapular nerve also seems to respond to pulsed radiofrequency (pRF) to decrease pain in the shoulder for extended periods of time [7,8].

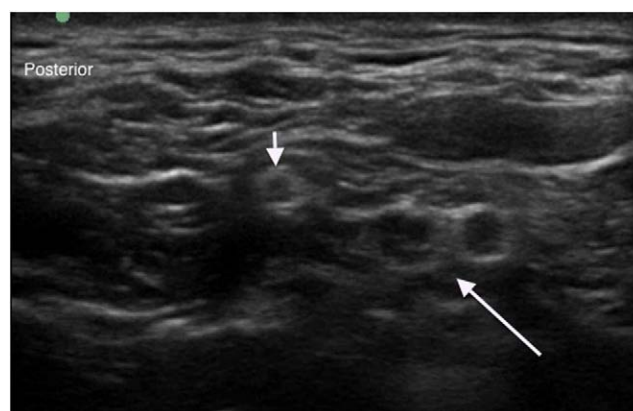
The nerve can be reliably blocked using fluoroscopy, by placing the needle just inferior to the scapular notch with or without nerve stimulation [7,9]. Ultrasound has been used to target the nerve [10]; however, there is some disagreement about what is actually being visualized when this technique is used [11]. Some even argue that using ultrasound alone, the needle does not approximate the nerve close enough for a reliable block [12]. This brief report describes a more superficial and possibly superior approach to the suprascapular nerve just distally from where it branches from the brachial plexus right above the clavicle. At this point, the nerve is very superficial (with respect to the surface), which allows for good needle visualization and excellent image resolution.

The patient was a 26 year old, active duty man who worked as a medical assistant in the Navy. He presented to the Pain Management Clinic with increasing shoulder pain that was worse with overhead activities. His examination showed increased pain with forward flexion of the shoulder to 90° and forced internal rotation, as well as pain with the arm pronated in full forced flexion. His neurovascular examination was normal. Based on these findings, the patient had a presumptive diagnosis of supraspinatus tendon impingement or subacromial impingement, and he was scheduled for a diagnostic suprascapular nerve block with local anesthetic. Previous to the injection, the patient was unable to abduct his arm greater than 70° (from midline) due to pain.

With the patient in the sitting position, using a linear high-frequency probe the brachial plexus was identified between the anterior and middle scalene muscles at the level of approximately C6. The probe was then moved down the neck, tracing the upper trunk distally. Quickly, the trunk was seen splitting into three nerves: the suprascapular, which is most posterior [Fig. 1], the continued upper trunk or lateral cord, and the nerve to the subclavius. The suprascapular nerve was then traced as distally as possible until the probe lay just above the distal clavicle and over the trapezius muscle [Fig. 2]. At this point, the suprascapular nerve was far enough away from its parent plexus that it provided an easy target to surround with local anesthetic or to use other techniques such as pRF. It is possible that local anesthetic may spread to the brachial plexus, but at this level the suprascapular nerve is contained in a fascial plane or within the muscle belly, which may limit spread. Once the nerve is identified, using an inplane approach from posterior to anterior, a block needle is advanced until the fascial plane that contained the nerve is entered. At this point, local anesthetic is deposited around the nerve [Video].

After the injection, the patient reported 100% pain relief and was able to abduct his arm completely (approximately 180° with external rotation). He reported no sensory changes in the arm or the cape of the shoulder. Given the more proximal placement of the block, there may be concern for post-block weakness. However, there was no weakness noted on examination or reported by the patient 15 minutes after the injection. However, on followup, the patient noted some weakness during the day, but was unable to quantify it further. It is likely that the motor fibers to some of the rotator cuff muscles were affected although not appreciated on examination.

Given the response to the injection, the patient returned for pRF treatment. Using the same approach, he was treated with pRF and received 5 months of excellent relief with no noted complications.



**Fig. 1** Suprascapular nerve (short arrow) just after branching away from the brachial plexus (long arrow), which is shown anteriorly and to the right. This is about at the level of C7.



**Fig. 2** Ultrasound probe over the trapezius muscle just superior to the distal end of the clavicle. Following the suprascapular nerve after this point becomes difficult as the clavicle provides an obstruction for the probe to slide more distally to track to nerve. The probe is angled to enhance nerve visualization in relation to surrounding structures. The needle is approached posteriorly and in-plane.

The suprascapular nerve is an important target in both chronic and acute pain, and there are many techniques described to successfully block the nerve. The use of ultrasound is attractive to both the acute and chronic pain physician because of its accessibility and portability. It also enables the physician to decrease his exposure to radiation if fluoroscopy is typically used. This report describes an ultrasound approach to the suprascapular nerve that may prove to be reproducible with images that are easily acquired with minimal ultrasound skill. This approach has been adopted by this author for both diagnostic suprascapular nerve blocks, and for treatment with pRF.

Note: The views expressed in this article are my own and do not necessarily reflect the official policy or position of the Department of the Navy, Department of Defense, or the U.S. Government.

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## Intravenous extension sets: when more is less

To the Editor:

In the operating room, the use of needleless access devices is quite common. One such device used routinely in our hospital is the small-bore extension set with ULTRASITE valve (B. Braun Medical, Inc., Bethlehem, PA, USA) [Fig. 1]. Although it was obvious to us that this device reduces the flow of intravenous (IV) fluids, the actual flow parameters were not anywhere to be found. This was surprising because almost every other piece of equipment related to IV fluids, both by this manufacturer and by others, had the maximal flow rates listed on the packaging (eg, IV catheters, tubing for the fluid warmers). We measured the rate of flow of this device and determined when, and in combination with which IV catheters, it becomes the rate-limiting factor.

The equipment is depicted in Fig. 2. The measurements were carried out using a one-liter bag of normal saline connected to a Y-type blood set (B. Braun Medical, Inc.) of 87 inches, a 4-way stopcock (Smiths Medical, Inc., Rockland,