Pulsed Radiofrequency Treatment for Chronic Shoulder Pain After Arthroscopic Rotator Cuff Repair

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OBJECTIVES

Although shoulder arthroscopy is a common surgical procedure for rotator cuff repair, it is known that some patients experience persistent postoperative pain, functional deficit [1,2]. In this situation, nonoperative management such as analgesics for pain and physical therapy is considered to preserve their shoulder function. If nonoperative management has failed, revision rotator cuff repair is considered. But the results of revision rotator cuff repair are inconsistent and worse to the result of previous operation [3]. The suprascapular nerve block is frequently performed for the patients with chronic shoulder pain, however, the effect provides only short-term pain relief. Recent reports addressed that pulsed radiofrequency (PRF) to the suprascapular nerve reduce shoulder pain for longer period and improve range of motion without weakness and sensory disturbance [4-6]. We present a patient with chronic shoulder pain who had been undergone arthroscopic surgery, and was treated successfully by pulsed radiofrequency (PRF) . This is the first case report using PRF to suprascapular and axillary nerve for persistent postoperative pain of shoulder.

METHODS

Subject:

A 55-year-old female was undergone arthroscopic rotator cuff repair for the left side partial-thickness rotator cuff tears. Although the operation performed without any problems, she had complained of a severe shoulder pain from the early postoperative period. The conventional therapies were not effective, the pain lasted for 9 months.

Complicating disease:

Depression stable with medication (paroxetine, alprazoram)

PRF procedure:

Patient was performed ultrasound-guided PRF to the suprascapular nerve and axillary nerves with 2 hertz current, 20 millisecond periods, and 42 degree Celsius for 120 seconds for three cycles. (JK3, Neurothermo®). (see ***Figure 1, 2***).

Outcomes:

We assessed pain intensity using an 11-point numerical rating scale (pain NRS) and maximum shoulder abduction and external rotation on a passive range of motion (PROM) at baseline. These parameters were recorded at 1, 4 and 12 weeks post PRF.

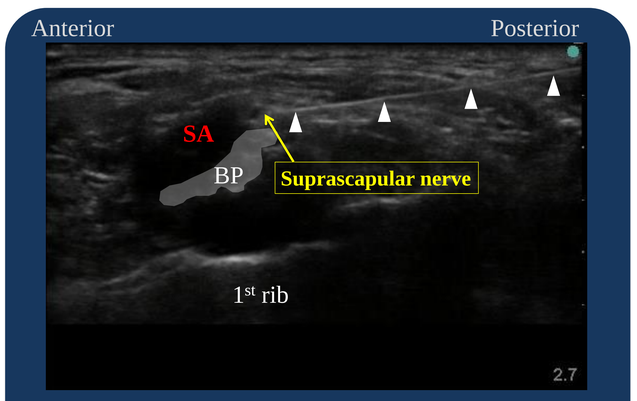


***Figure 1*: Ultrasound-Guided Pulsed Radiofrequency Treatment to the Suprascapular Nerve**
BP brachial plexus, SA suprascapular artery
white triangles indicate needle position

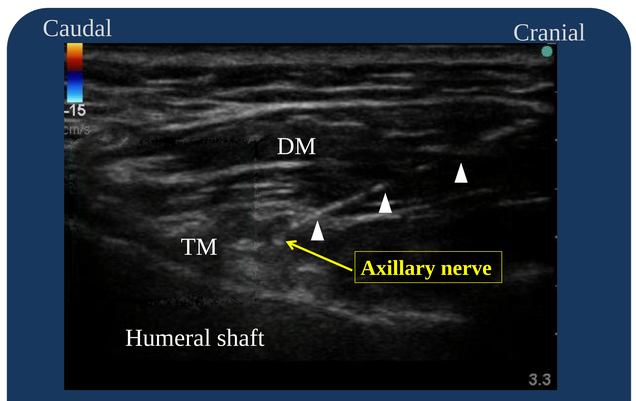
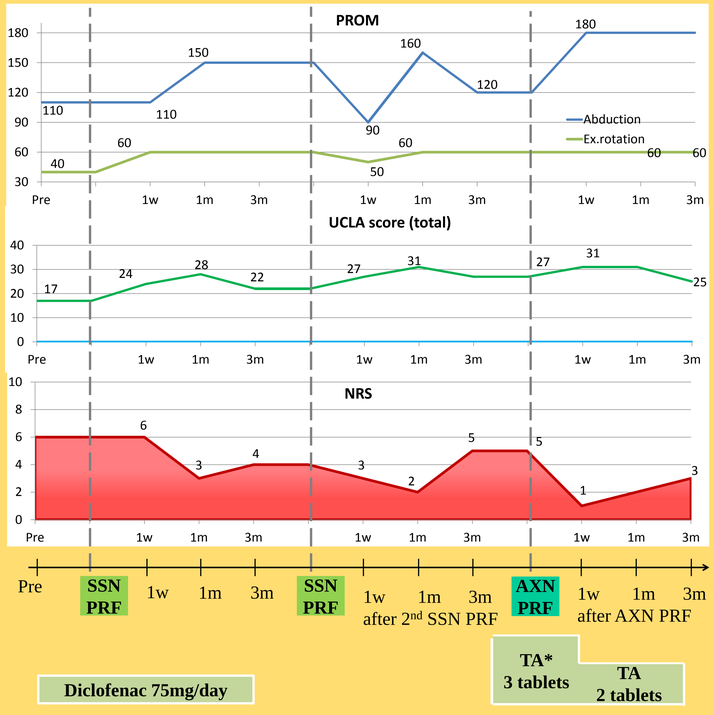


***Figure 2*: Ultrasound-Guided Pulsed Radiofrequency Treatment to the Axillary Nerve**
DM deltoid muscle, TM teres minor muscle
white triangles indicate needle position



RESULTS

The patient complained pain on the anterolateral side of her shoulder at rest and when she moved her arm. The intensity of the anterior shoulder pain decreased immediately after the ultrasound guided PRF to the suprascapular nerve. The pain recurred in 2 months, so we performed same procedure again. After the second time PRF, the range of motion of the left shoulder gradually improved, and the total UCLA score kept good/excellent results, meanwhile, the posterior shoulder pain remained. We applied PRF of the axillary nerve in order to relieve this pain. After the last procedure, posterior region of the shoulder pain reduced. No complications were observed.

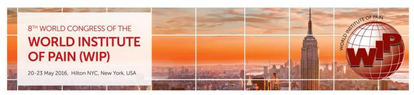
***Figure 3*:** The maximum shoulder abduction and external rotation on passive range of motion (PROM), UCLA score (total) , and numerical rating scale pain scores by follow-up time-point are illustrated.
Ex. rotation external rotation
SSN suprascapular nerve, AXN axillary nerve
*TA tramadol / acetaminophen. It contains 37.5mg tramadol and 325mg acetaminophen.

DISCUSSION

In our case, although the ultrasound-guided PRF to the suprascapular nerve reduced the partial region of shoulder pain, the posterior shoulder pain remained. The suprascapular nerve, derived from the C5 and C6 of spinal cord, supplies 70% of the sensory nerve supply to the shoulder joint, including the superior and posterior regions of the shoulder joint. The axillary nerve also origin in the C5 and C6, then two major trunks give off branches deltoid muscle [6]. This nerve innervation around shoulder joint is thought to require the combination PRF procedure to provide sufficient effect. Recent years, there are some reports of PRF treatment for chronic shoulder pain. Prospective case series have presented that PRF to the suprascapular nerve provides long-lasting pain reduction and improvement in joint function without serious complication [7,8]. The exact mechanism of PRF for pain relief is not fully understood. Previous animal studies revealed that the electromagnetic field produced by PRF gives damage to the structures within the axons of sciatic nerve at the ultrastructural level. The damage were observed as mild axonal damage and little swelling of the mitochondria, and these changes were prominently found in the unmyelinated C-fibers and the thinly myelinated A-δ fibers [9, 10]. This selective effect of PRF on the nociceptive C and A-δ fibers may explain the analgesic effects without sensory disturbance and motor paralysis.

CONCLUSION

Ultrasound-guided combining PRF to the suprascapular nerve and axillary nerve can be an useful treatment for the patient with chronic postoperative shoulder pain and it supports functional return.



Faculty Disclosure

✔	No, nothing to disclose
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