

## High-voltage pulsed radiofrequency of the suprascapular nerve for the treatment of chronic shoulder pain

We present the case of a 46-year-old female childcare worker with type 1 diabetes mellitus as the only medical history of interest. She presented to the physical medicine and rehabilitation department with symptoms of mechanical right shoulder pain of 3 years duration, with no previous history of trauma. The patient reported severe pain, predominantly at night, which was refractory to analgesics, worsened with mobilization, and caused severe limitations in basic activities of daily living.

On physical examination, we observed no skin lesions or deformities of the acromioclavicular joint. In terms of mobility, there was active limitation in flexion and abduction, reaching a maximum of 90° in both, as well as in external and internal rotation at 20°. Exploratory maneuvers were performed and were positive for Apley, Jobe, Hawkins, and Pate tests.

Anteroposterior, axial, and lateral radiographs of the right shoulder were obtained with no evidence of fracture lines or tendon calcifications. Magnetic resonance imaging of the right shoulder was requested, which

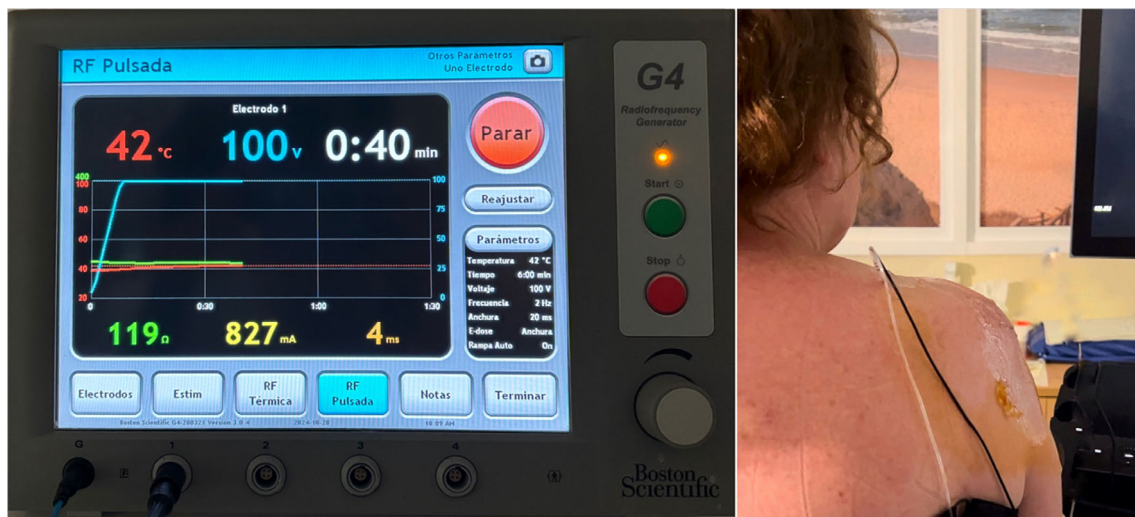
revealed subacromial-subdeltoid bursitis, supraspinatus tendinopathy, infraspinatus and subscapularis tendinosis, accompanied by adhesive capsulitis.

In addition to treatment with oral nonsteroidal anti-inflammatory drugs, the patient in physiotherapy with passive kinesitherapy to restore joint balance and ultrasound therapy, with little subsequent clinical improvement.

At the first interventional pain consultation, with prior written informed consent, we performed a blockade of the suprascapular nerve with local anesthetic and corticosteroids under ultrasound guidance and aseptic conditions.

The patient was reevaluated 3 months after the initial examination and reported partial improvement after approximately 3 weeks of infiltration, thus suprascapular nerve radiofrequency (RF) was indicated.

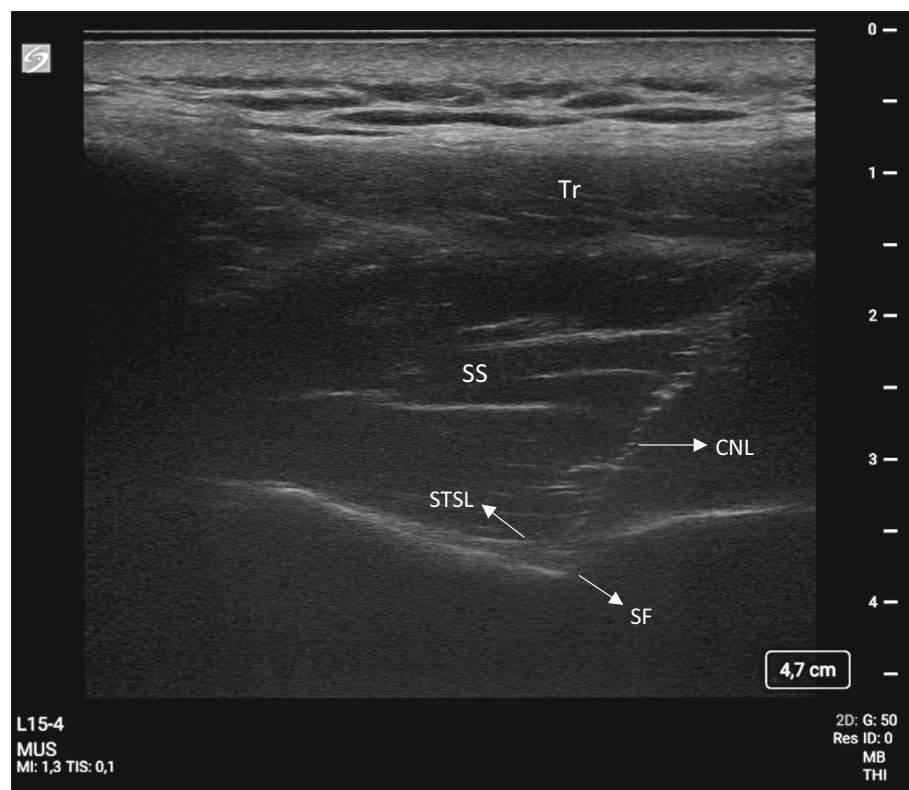
The patient presented with pain of 9 out of 10 on the Visual Analogue Scale (VAS) at the time of consultation. RF of the right suprascapular nerve was performed at 42° at 100 V for 360 seconds using the G4



**FIGURE 1** Radiofrequency of the right suprascapular nerve performed at 42° at 100 V for 360 seconds using the G4 RF Generator Radiofrequency Boston Scientific device.

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**FIGURE 2** Ultrasound image of cannula (CNL) with thermal control during pulsed radiofrequency in the suprascapular fossa (SF) inferior to the superior transverse scapular ligament (STSL). SS, supraspinatus muscle; Tr, trapezius muscle.

RF Generator Radiofrequency Boston Scientific device with a 10 cm × 10 mm × 22 ga (0.7 mm) Unified thermal control cannula (Figure 1). The procedure was conducted under ultrasound guidance, using the Sonosite ST ultrasound scanner, after written informed consent and under aseptic conditions (Figure 2).

The patient was reassessed 2 months later to measure clinical improvement, obtaining a score of 5 in the VAS. Six months after the RF procedure, the patient was reevaluated and reported a marked increase in joint balance and significant improvement in pain, being asymptomatic at the time of evaluation and up to 1 year postintervention follow-up (VAS = 0).

The high-voltage, pulsed RF procedure we performed on the suprascapular nerve is innovative, as no previous studies of RF at 100 V on the suprascapular nerve have been published in the literature, to our knowledge.

Nevertheless, there have been several studies of the benefits of pulsed RF with different stimulation parameters (all using the same voltage of 45 V), which have been shown to be more effective than other treatments for pain control in conditions such as hemiplegic shoulder,<sup>1</sup> frozen shoulder,<sup>2</sup> and adhesive capsulitis.<sup>3</sup>

In addition, we found studies supporting the usefulness and safety of high-voltage pulsed RF in the treatment of trigeminal neuralgia<sup>4</sup> and pudendal neuralgia.<sup>5</sup> Other studies, such as that by Erken et al.,<sup>6</sup> show that both high- and low-voltage RF to the lumbar dorsal root ganglion are effective in the treatment of chronic low

back pain, with high-voltage giving better results with a similar rate of complications.


In conclusion, the results we have obtained with high-voltage, pulsed RF on the suprascapular nerve represent a therapeutic effect with long-term pain relief, restoration of joint balance, and significant improvements in quality of life. Our research provides promising and pioneering results for the treatment of chronic shoulder pain.

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#### DISCLOSURE

None to declare.

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**REFERENCES**

1. Alanbay E, Aras B, Kesikburun S, Kizilirmak S, Yasar E, Tan AK. Effectiveness of suprascapular nerve pulsed radiofrequency treatment for hemiplegic shoulder pain: a randomized-controlled trial. *Pain Physician*. 2020;23(3):245-252.
2. Yan J, Zhang XM. A randomized controlled trial of ultrasound-guided pulsed radiofrequency for patients with frozen shoulder. *Medicine (Baltimore)*. 2019;98(1):e13917. doi:10.1097/MD.00000000000013917
3. Wu YT, Ho CW, Chen YL, Li TY, Lee KC, Chen LC. Ultrasound-guided pulsed radiofrequency stimulation of the suprascapular nerve for adhesive capsulitis: a prospective, randomized, controlled trial. *Anesth Analg*. 2014;119(3):686-692. doi:10.1213/ANE.0000000000000354
4. Wang Y, Jia Y, Wang Z, et al. Efficacy and safety of high-voltage pulsed radiofrequency versus standard-voltage pulsed radiofrequency for patients with neuropathic pain: a literature review and meta-analysis. *J Pain Res*. 2024;17:851-863. doi:10.2147/JPR.S439909
5. Wang CL, Song T. The clinical efficacy of high-voltage long-duration pulsed radiofrequency treatment in pudendal neuralgia: a retrospective study. *Neuromodulation*. 2022;25(8):1372-1377. doi:10.1111/ner.13401
6. Erken B, Edipoglu IS. Efficacy of high-voltage pulsed radiofrequency of the dorsal root ganglion for treatment of chronic lumbosacral radicular pain: a randomized clinical trial. *Neuromodulation*. 2024;27(1):135-140. doi:10.1016/j.neurom.2022.10.056

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