Rhomboid Major Muscle Ultrasound-Guided Trigger Point Injection: A Case Report and Technique Description

Iniekcja punktu spustowego mięśnia równoległobocznego większego wykonywana pod kontrolą ultrasonografii: opis przypadku oraz opis techniki

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Key words
myofascial pain syndrome, ultrasound guidance, myofascial trigger point, trigger point injection

Abstract
Introduction: Myofascial pain syndrome is an acute and chronic painful musculoskeletal condition that involves muscle and surrounding connective tissue. Trigger point injection is a common treatment for this condition providing long-term relief. The procedure is generally safe; however some side effects have been reported including pain, nerve injury, bleeding, infection, and pneumothorax.

Objective: To report a case of a patient with myofascial pain syndrome successfully treated by Ultra Sound-guided infiltration of a myofascial trigger point in the rhomboid major muscle.

Case description: A 39-year-old presented with cervical and dorsal pain of 4 months of evolution. She had physical and occupational therapy, with partial improvement of cervical pain but persistence of dorsal pain. No abnormal finding was noted on the neurological examination. On palpation, the patient had a myofascial trigger point in the left rhomboid major muscle. Given the persistence of the myofascial trigger point after physical therapy, it was considered the patient might benefit from Ultra Sound-guided infiltration. No adverse events were reported. At the end of the procedure, the patient reported a 70% reduction in pain. The patient returned for a follow-up visit one month after the procedure, reporting pain relief of 80%.

Conclusions: The use of an Ultra Sound-guided technique for trigger point injection decreases the risk of iatrogenic complications. The blind method may result in poor localization of the point. Further studies are required to develop Ultra Sound based criteria to determine its clinical use.

Słowa kluczowe
mięśniowo-powięziowy zespół bólowy, kontrola USG, mięśniowo-powięziowe punkty spustowe, iniekcja punktu spustowego

Abstrakt
Wstęp: Mięśniowo-powięziowy zespół bólowy jest ostrym, przewlekłym i bolesnym stanem układu mięśniowo-szkieletowego, który obejmuje mięśnie oraz otaczającą je tkankę łączną. Zastrzyk do punktu spustowego jest powszechnym sposobem leczenia tego schorzenia, dającym długotrwałą ulgę. Procedura jest generalnie bezpieczna; jednakże zgłaszano pewne objawy niepożądane takie jak ból, uszkodzenie nerwów, krwawienie, infekcje, oraz odmę opluśnicy.

Cel: Opis przypadku pacjentki z mięśniowo-powięziowym zespołem bólowym leczonych skutecznie za pomocą infiltracji pod kontrolą USG mięśniowo-powięziowego punktu spustowego w mięśni równoległobocznym większym.

Opis przypadku: 39-letnia pacjentka, z występującym od 4 miesięcy bólem szyjnym i grzbietowym. Po fizjoterapii oraz terapii załączowej, ból szyi częściowo zaciągnął ale ból grzbietu utrzymywał się. W badaniu neurologicznym nie stwierdzono żadnych nieprawidłowości. Podczas badania palpacjnego, w lewym mięśni równoległobocznym większym pacjentki wykryto mięśniowo-powięziowy punkt spustowy. Biorąc pod uwagę utrzymywanie się mięśniowo-powięziowego punktu spustowego po fizjoterapii, uznano, że pacjentce mogłaby pomóc infiltracja kontrolą ultrasonografii. Nie zgłoszono żadnych niepożądanych wydarzeń.

The individual division of this paper was as follows: A – research work project; B – data collection; C – statistical analysis; D – data interpretation; E – manuscript compilation; F – publication search

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INTRODUCTION

Myofascial pain syndrome (MPS) is an acute and/or chronic painful musculoskeletal condition that involves muscle and surrounding connective tissue. It is characterized by a myofascial trigger point (MTrP) with firm, discrete, palpable nodules in the taut band of muscle that may be spontaneously painful or painful with pressure. MPS is a frequent cause of outpatient visits in Physical Medicine and Rehabilitation practice.

Trigger point injection is a common treatment for MPS, providing temporary or long-term relief. The procedure is generally safe; however, some side effects have been reported, including: pain, nerve injury, bleeding, infection, and pneumothorax. Using ultrasound guidance benefits patients due to improve localization of the injection site by visualization of the MTrP, with subsequent reduction of side effects.

The MTrp located in the rhomboid major muscle (RMM) is a frequent cause of dorsalgia. It is originated from the spinous processes of the T2 through T5 vertebrae and inserts into the inferomedial part of the scapula. It is a thin muscle situated between the middle trapezius and the pleura and major neurovascular structures. The muscle has a quadrilateral shape, and its action is to displace the scapula medially, holding it close to the chest wall and rotating the scapula down.

We report a case of a patient with MPS who was successfully treated by ultrasound-guided (US-guided) infiltration of MTrp in the RMM.

CASE DESCRIPTION

A 39-year-old woman with unremarkable medical history presented with cervical and dorsal pain of 4 months evolution. She had physical and occupational therapy with partial improvement of cervical pain but persistence of dorsal pain. The maximum pain site was located in the left interscapular region. No abnormal finding was noted on the neurological examination, including the evaluation of deep tendon reflexes, strength muscle testing, and sensory examination. On palpation the patient had MTrP in the right RMM. Given the persistence of the MTrP after physical therapy, it was considered the patient may benefit from US-guided infiltration. The patient was informed of the risk and benefits of the procedure, and an informed consent form was signed.

The patient was seated in a neutral position, her affected side hand was...
month after the procedure, reporting NRS of 2/10, a pain relief scale (PRS) score of 80% (NRS has fallen from 10/10 before procedure to 2/10 at 1 month follow-up), with minimal pain to palpation.

**DISCUSSION**

MTrP of RMM is a frequent cause of dorsalgia and trigger point injection is the treatment of choice. Palpation of a thoracic rib is suggested to reduce the risk of pneumothorax during puncture of this muscle. Cushman et al showed the safety of needle electromyography (EMG) examination of the RMM. Two Physical Medicine & Rehabilitation (PM&R) staff, with 4 and 7 years of experience performing EMG, palpated 44 healthy subjects to attempt to identify the center of a rib located beneath the RMM. The identified location was examined with US to determine its accuracy and anatomical depths, demonstrating only a 66.3% accuracy rate of palpation compared to US, with significantly more incorrect palpations seen with larger muscle thickness and body mass index.

Major complications, including pneumothorax and neuropathy, have been described in literature: Patel et al presented a case of a 44-year-old man who had dry needling of the infraspinatus, supraspinatus, rhomboid major, and paraspinal muscles with subsequent development of a left apical pneumothorax. Also, Lee and Chang reported the case of a 38-year-old male patient who presented with right dorsal scapular neuropathy after a trigger point injection into the RMM, confirmed by nerve conduction study and EMG.

As for the depth of the needle, Seol et al examined the appropriate depth for needle insertion into the RMM and determined that the distance from skin to rib was dependent upon the BMI, yet the muscle thickness was not. For patients with a BMI <23 kg/m², as with our patient (BMI 22 kg/m²), the depth of the needle was 1.4 to 1.7 cm.

Dinesh Kumbhmare et al, in a literature review about ultrasound-guided...
interventionsal procedures in MTrP, highlight the lack of consensus on the technique for injection. The blind method may result in poor localization of the point and further work is required to develop US-based criteria for determining its clinical use. There is reason to believe that US-guided trigger point injection offers potential benefits to patients, including improved localization, appropriate injection into the MTrP, and reduction of adverse events2.

From the anatomical point of view, the puncture of the RMM is difficult with the blind technique, because it is under the trapezius muscle and with multiple overlapping muscles. A double-blind study was conducted that included 65 patients with a diagnosis of MPS who were randomized into 2 groups. In group 1 (33 patients), US-guided RMM injection was performed and in group 2 (32 patients), US-guided trapezius muscle injection was performed. This study concluded that US-guided deep injection of the RMM was more effective than superficial injection of the trapezius muscle for pain, disability reduction, and increased quality of life4.

CONCLUSIONS

We presented the case of a patient successfully treated with US-guided RMM infiltration and described the technique used. The use of an US-guided technique for RMM trigger point injection could decrease the risk of iatrogenic complications compared to the blind method, with additional potential benefits to patients improving localization and appropriate injection into the MTrP.

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Conflict of interest

No potential conflicts of interest relevant to this article were reported.

Conflicts of interest

The authors report no conflicts of interest.

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