

# Implication of local muscle response to precise dry needling in clinical outcomes of treatment myofascial pain

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## Background and aims

Ultrasound revolutionarized treatment of myofascial pain [1,2], performing precise muscle dry needling (DN) under ultrasound (US) guidance can multiply the effect, although if performed in a precise approach [1]. It has been discussed that local muscle response (also a.k.a. *local twitch response, LTR*) as a possible mechanism associated with inactivation myofascial trigger points (MTrP) [2] and treatment myofascial pain. However, controversies still exists in the issue, it was reported that `the application of DN without eliciting LTR seemed to produce more improvement in the pain intensity` [3].

**The aim** was to test hypothesis that local muscle response is associated with clinical effect of precise DN.

## Methods

We included 38 patients (23 females, 36±7 years old) with chronic low back pain. The protocol by **R.Bubnov** [<https://doi.org/10.1186/1878-5085-3-13>] was applied: MTrP were identified according to clinical examination, referred pain pattern, US identification; single fine (28G) steel needle DN under US guidance was applied to elicit LTR and/or `needle grasp`. We evaluated both phenomena, did M-mode to detect fasciculations during DN. Visual analogue scale data (VAS 0-10) were measured before and after procedures.

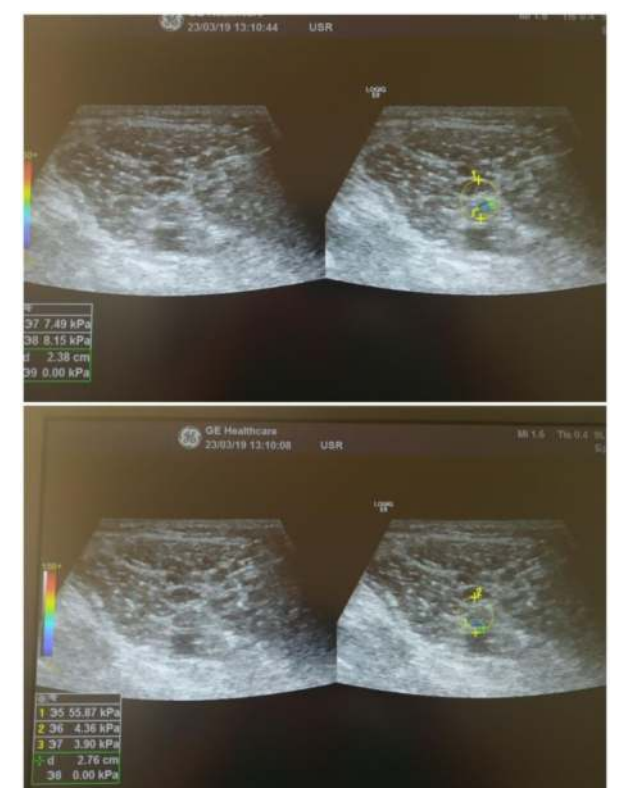
### Approach [1-2]

1. Clinical definition zone of possible trigger point—pain syndrome with typical referred pain pattern registration.
2. Trigger point palpation. Palpation of a hypersensitive bundle or nodule of the muscle fiber of harder than normal consistency. Localization of a trigger point is based on the sense of feel, assisted by patient expressions of pain, and by visual and palpable observations of local twitch response [1].
3. Using precise physical tests, extensive neuromuscular ultrasound using M-mode to evaluate muscle thickness, CSA and motion, different patterns of decreasing motility, contractility (muscle contracted / rested thickness) in involved muscles.
4. When the affected muscle is detected, ultrasonography examination is performed for myofascial trigger point visualization using gray-scale, Doppler, and sonoelastography [1-2].
5. After the visual identification of the trigger point, dry needling was performed—acupuncture needles were inserted into MTrP to elicit the LTR effect. The needle was held in the tissue until complete disappearance of the LTR which could be considered similar to the phenomenon of the 'needle grasp,' which has been attributed to the muscle fibers contracting around the needle, and was held tightly in place to increase the resistance to further move the inserted needle.
6. Ultrasound control after procedure.
7. Visual analog scale (VAS) scores (0–10) were recorded throughout the study period before, immediately after, and 24 h after the procedure.

## Results

All patients showed decrease in pain as measured by a VAS of 90%, main active MTrPs were diagnosed in paravertebral ("central") MTrP and "peripheral" MTrP in muscles, the additional (latent) MTrPs were defined and effectively needled. In one session 1-3 needles were inserted, 1-2 sessions applied to each patient. Deep dry needling performed in active MTrPs in depth over 30 mm; we to detected fasciculation during first 30-60 sec on M mode and `needle grasp` over 20 min. In stronger muscles we observed both effects (LTR due to complex architecture); in small and deeper muscles – `needle grasp` only; in superficial and latent MTrPs - LTR only. Retention of needles correlated with LTR duration and the clinical effect.

*We revealed excessive responses (LTR and `needle grasp`) in lean individuals with Flammer syndrome phenotype [4].*



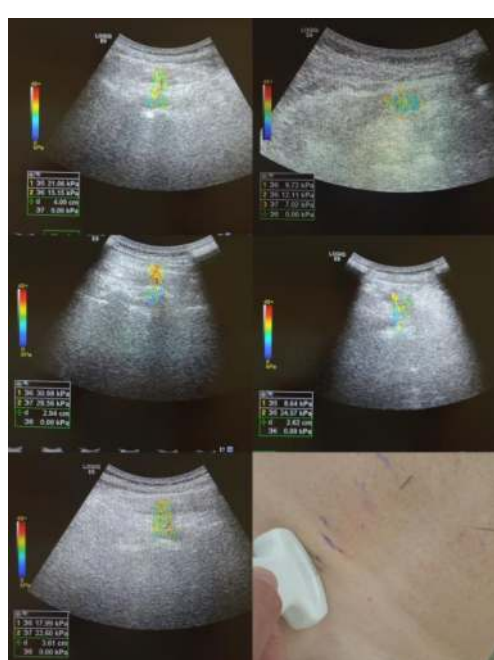
Muscle sonoelastography (SWE) detects decreasing muscle (TrP) stiffness during / after needling

M-mode detects muscle twitching during needling (arrow) - phases of needling effect on muscle – note fluctuations decrease up to full relaxation (during approx. 20 min.)

## Conclusion

Muscle response is crucial for effective treatment during trigger points dry needling and can be manifested as twitching (LTR) and / or needle grasp in deep DN with small amplitude fasciculations, depends on depth and architecture of contracted muscle fibers and activity of MTrPs and overall effect of treatment.

Muscle sonoelastography (SWE) for identification TrPs



## References

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