

Ultrasound control of muscle and joint pathology and therapeutic intervention under ultrasound control



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Ultrasound is a crucial medical tool for assessing the condition of organs and systems.

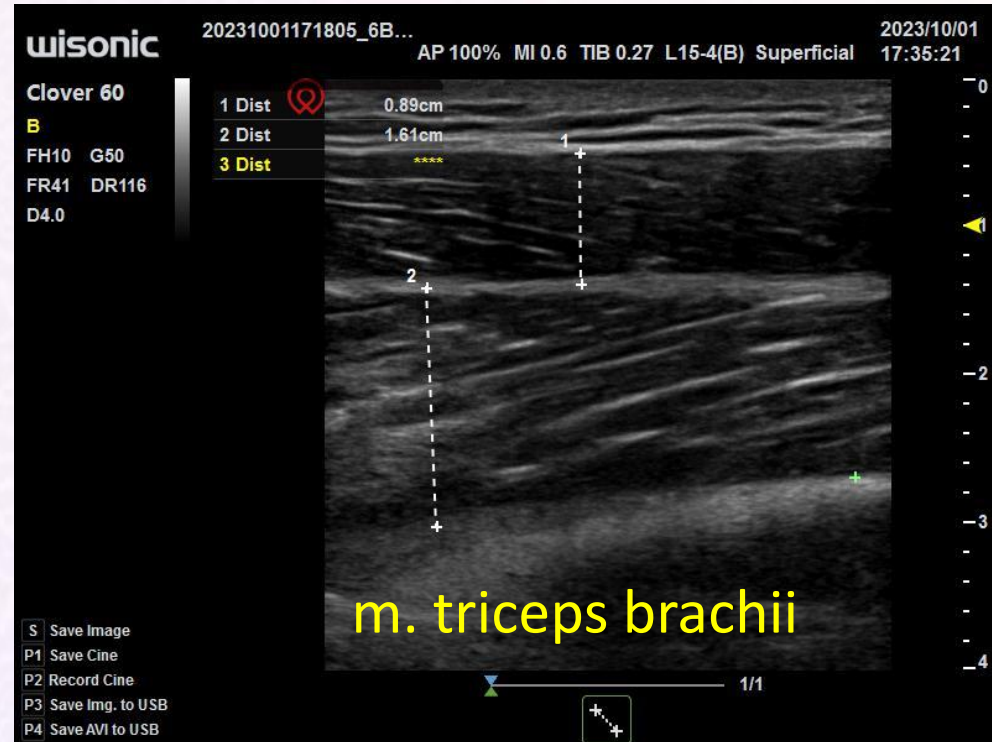
This report explores the application of US for visualizing muscles and joints and for monitoring therapeutic interventions in these areas.



Normally, ultrasound clearly shows the transverse-striated structure of the muscles.

Visualization of myospasms is accompanied by an ultrasound picture of hypoechogenicity and a change in the shape of the damaged muscle.

Over time, the acoustic signal is amplified by the degeneration of muscle fibers in the connective tissue.



Viktor, 23 y.o.
Football and beachsoccer player.
2023/10/01



Aim

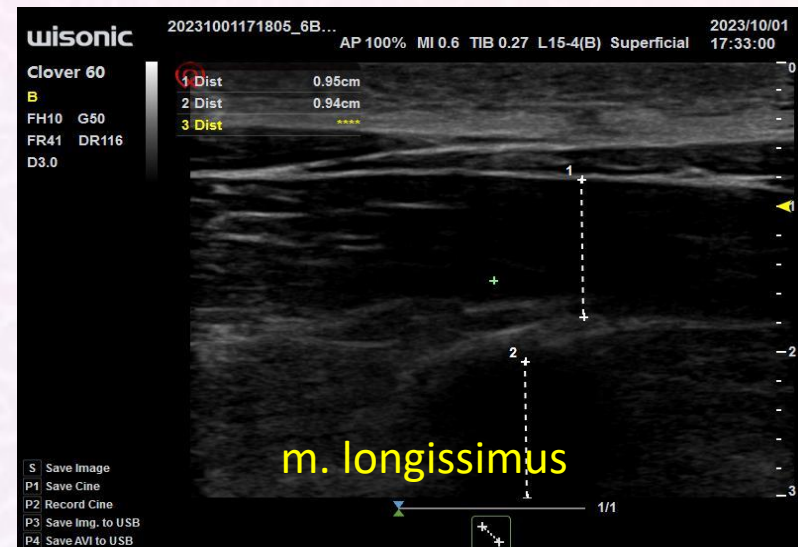
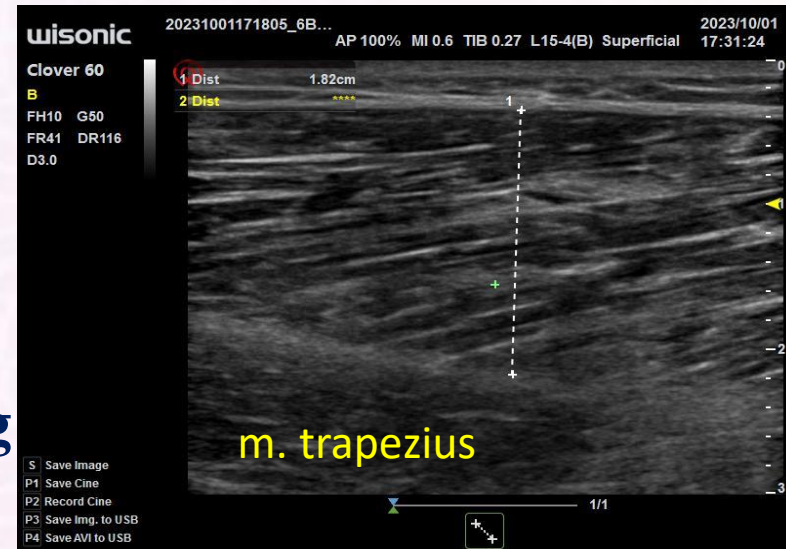
The aim of our research was to refine US methods for visualizing muscles with subsequent correction and minimizing degenerative changes in muscle structure.

Within the scope of our study, we conducted US examinations of the long muscles of the back (*m. longissimus*) and the muscles of the lower limbs in patients complaining of localized chronic pain. Virtually all examined patients exhibited myospasms in the neck (*m. trapezius*) and upper chest muscles with degenerative-destructive changes.

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Aim

The spasmodic muscle differs in its ultrasound structure from other muscles.

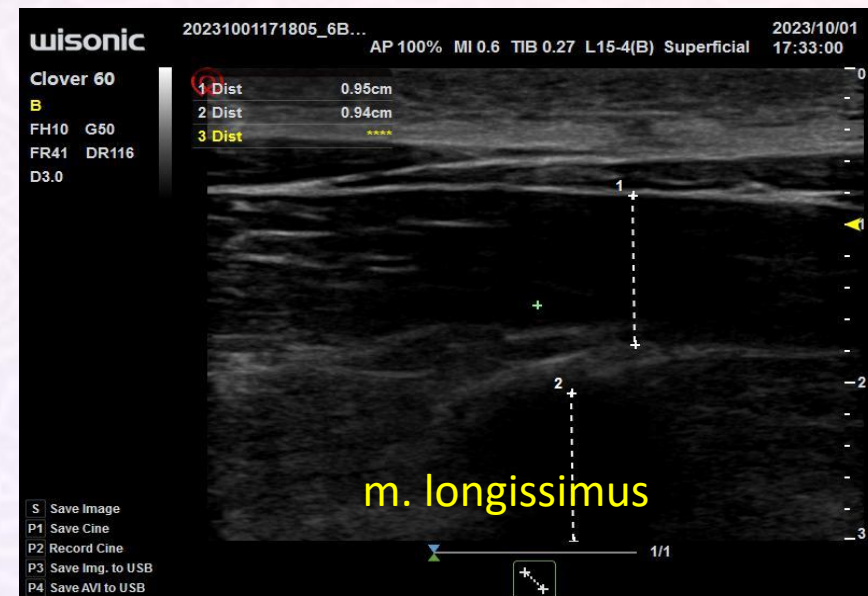
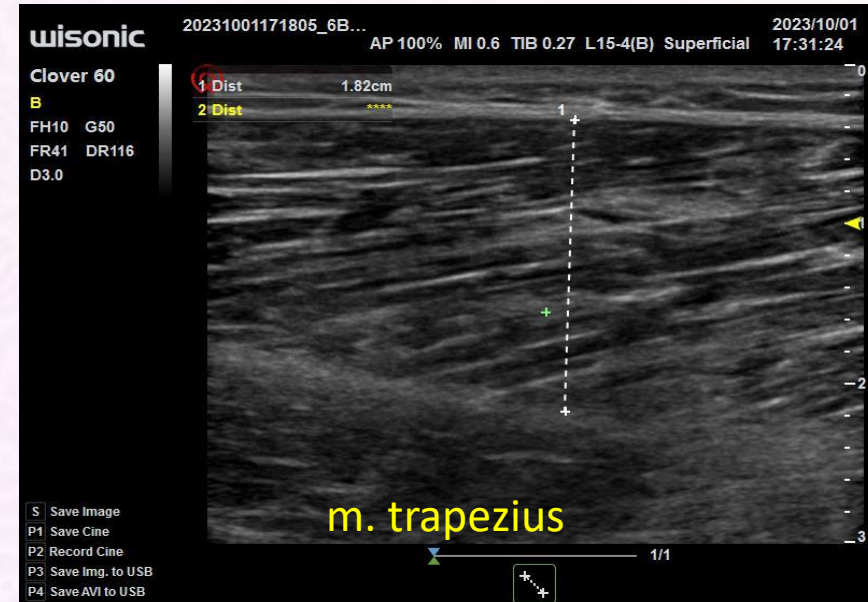
It is clearly contoured, often **mango-shaped**.

In advanced cases, the acoustic density of the transverse striated fibers is increased, but the fiber placement vector is preserved.

The bottom figure shows **2 recently spasmed muscles**.



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In **treatment process**, we applied the innovative technique of dry needling of spasmodic muscles under US guidance, developed by **Dr. Bubnov R.V.* (Ukraine)**

This technique not only restored muscle structure but also improved blood supply to the muscles and stabilized the recovery process.

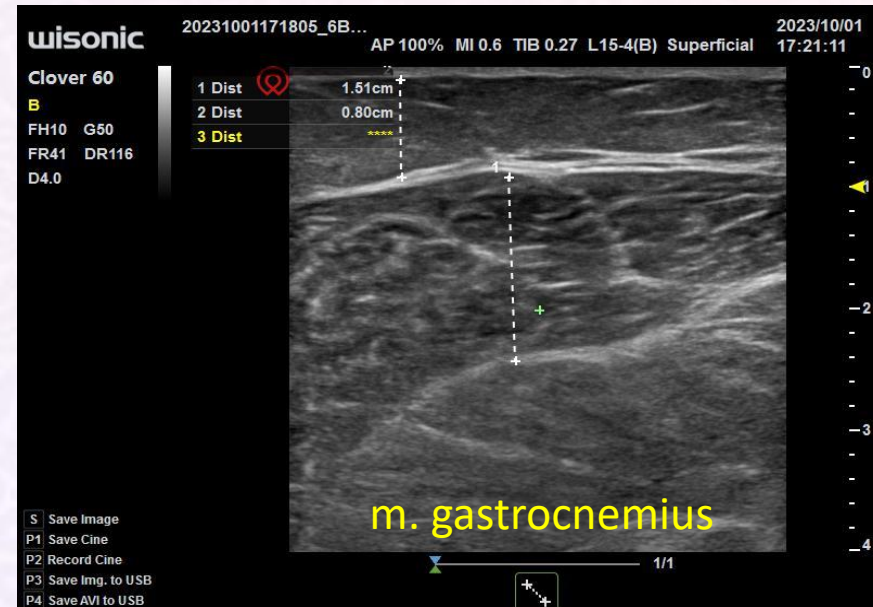
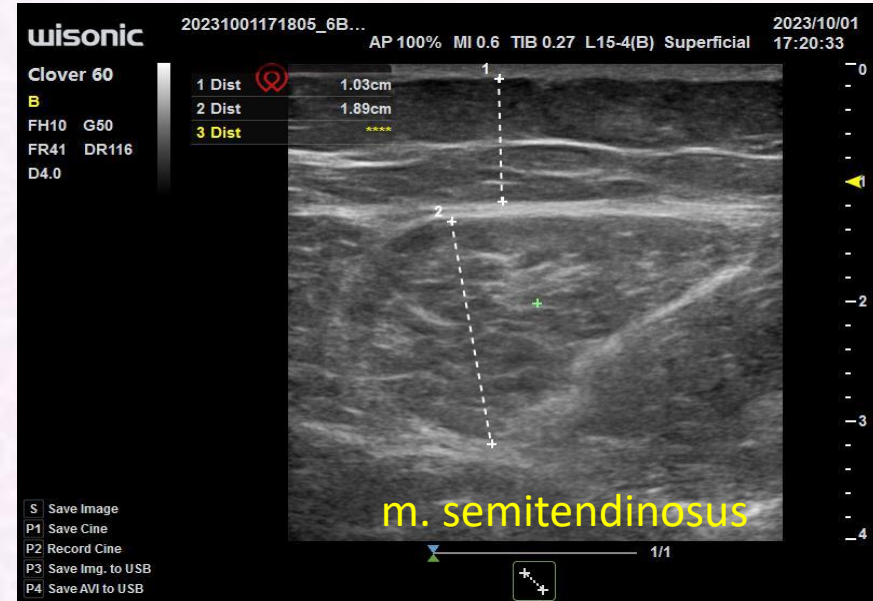
An integrated US-guided **myofascial relaxation technology** enables us not only to diagnose pathology but also to effectively influence the process of muscle tissue restoration.



*Bubnov, R.V. Evidence-based pain management: is the concept of integrative medicine applicable?. *EPMA Journal* **3**, 13 (2012). <https://doi.org/10.1186/1878-5085-3-13>

The images show a delayed post-traumatic spasm with myoarchitectural disorders and a high index of degenerative changes.

The blood supply to these muscles has already been reduced by 30-60%.

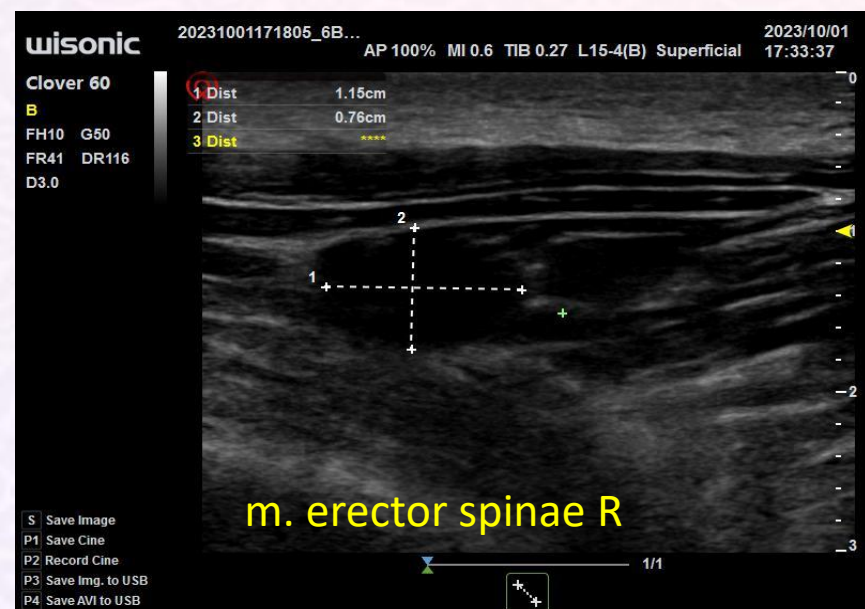
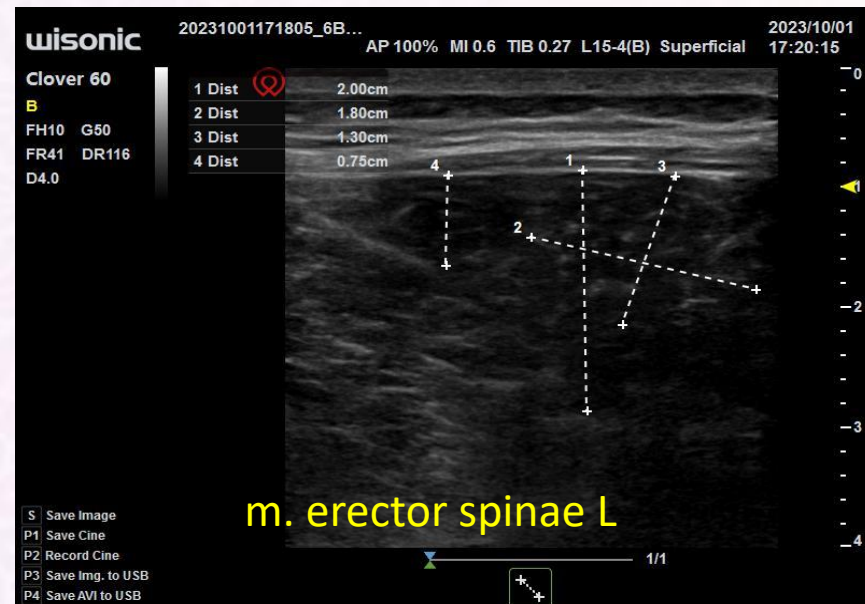


Kseniya, 26 y.o.
Fitness coach.
2023/10/01

After the first session of needling

We apply US scanning of muscle tissue and Doppler imaging to evaluate the blood supply to muscles and the musculoskeletal system.

That's why practically large spasms and triggers are broken down into smaller ones and all patients experienced pain relief after the first session of needling under US monitoring.



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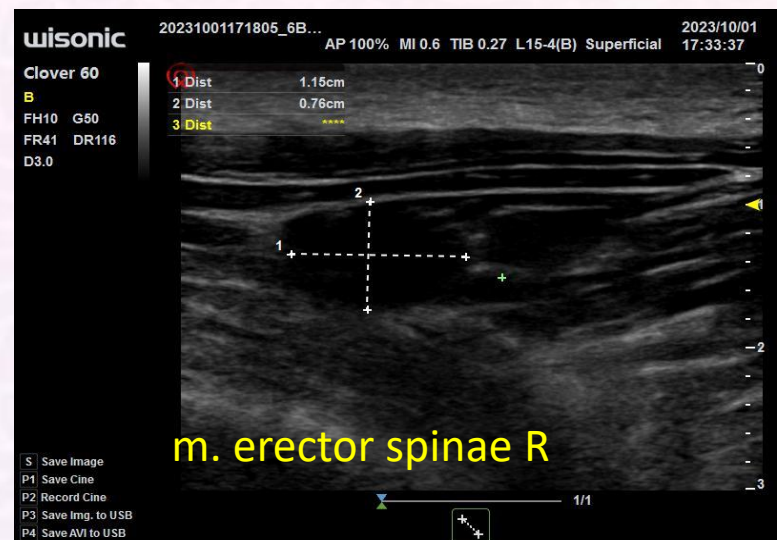
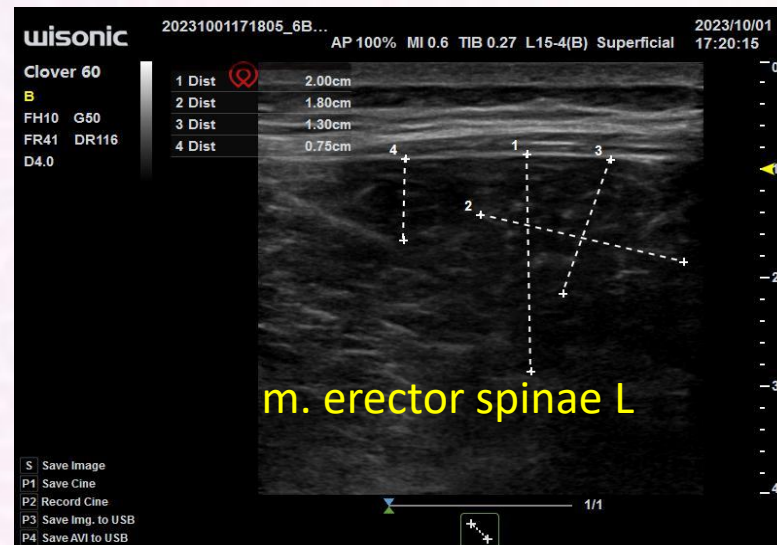
After the first session of needling

It is important to compare paired muscles and start the examination with a healthy muscle, which helps to differentiate pathology and compare it with the relative norm.

The ultrasound structure after acupuncture in the projection of the spasmodic muscle has changed: the volume of the spasmodic muscle decreases, hypoechogenicity changes to normal echogenicity of the muscle fiber, and the patient subjectively feels relief from the unpleasant chronic dull pain.



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A method for ultrasound diagnostics of vessels in the brain. Patent № 10262 A dated 19.07.95



A method for assessment of the regional angioarchitectonics. Patent № 67707 A dated 31.12.03



A method of assessment of a gray-scaled scanned image. Patent № 67708 A dated 31.12.03



A method for neurorehabilitation of patients suffering from apallic syndrome. Patent № 72725 A dated 31.12.03



A method for assessment disorders of microcirculation in norm and with pathology in patients of different ages with the help of smart capillaroscopy. Patent № 67709 A dated 31.12.03



A method for application of combination of medicines for correction of the arteriovenous disbalance. Patent № 72868 A on 31.12.03



A method for treatment of convulsive syndrome. Patent № 71505 A on 31.12.03



A device for the capillary circulation registration. Patent № 22944 dated 25.05.07



A device for the vascular screening. Patent № 85052 dated 11.11.2013

- ❖ US examination and treatment of the musculoskeletal and myofascial apparatus represent a new technology that demonstrates high efficacy in the treatment of back pain and muscle pathologies. It also helps to prevent untreated intervertebral herniations and surgical interventions in many cases.
- ❖ Research and application of US technologies in medicine remains at the forefront of improving the diagnosis and treatment of various pathologies, particularly in the field of muscles and joints.





**Sincerely grateful you
for your attention!**



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