Cite as: Dede BT, Oğuz M, Alyanak B, Bağcier F: Ultrasound-guided 3-in-1 injection; myofascial trigger point injection and greater occipital nerve block. Aktualn Neurol 2024; 24 (4): 166–168

Received: 31.07.2024
Accepted: 16.10.2024
Published: 16.05.2025

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Ultrasound-guided 3-in-1 injection; myofascial trigger point injection and greater occipital nerve block

Nakłucie 3-w-1 pod kontrolą USG; terapia punktów spustowych mięśniowo-powięziowych i blokada nerwu potylicznego większego

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https://doi.org/10.15557/AN.2024.0025

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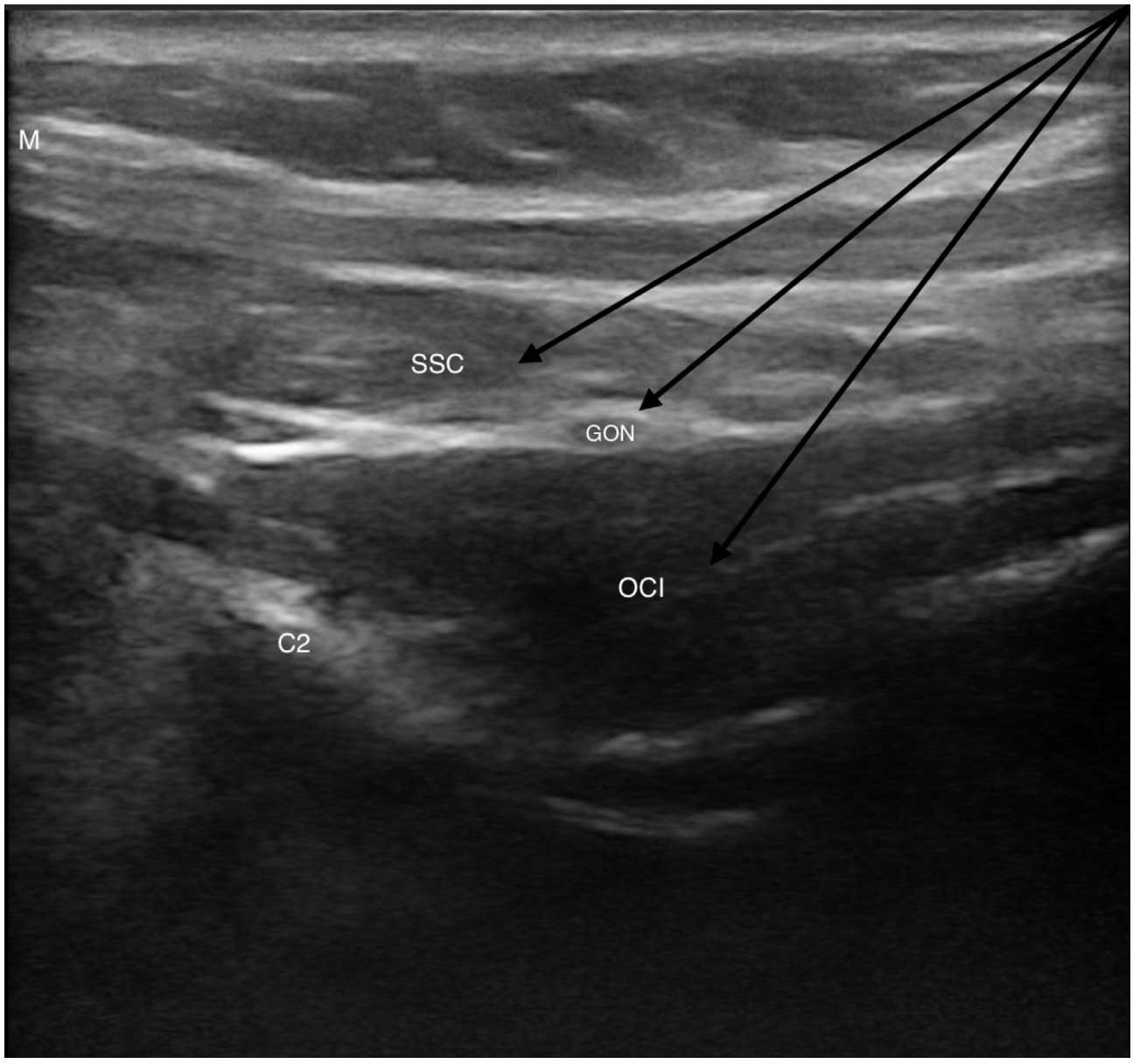
Headache is a very common neurological symptom, and there are many types. An individual may experience different types of headaches at the same time. Appropriate treatment can be performed by recognising the type of headache (Carbaat and Couturier, 2016). Myofascial pain syndrome is also a cause of headaches. It has been previously shown in the literature that myofascial pain syndrome, characterised by the presence of trigger points, is associated with headaches such as tension-type, cervicogenic, and migraine (Fernández-de-Las-Peñas, 2015). Treatment of trigger points has shown positive results in individuals with headaches (Fernández-de-Las-Peñas, 2015).

One of the invasive methods used in the treatment of headaches is the greater occipital nerve (GON) block. It has been reported that the GON block is effective for various headache types, such as occipital neuralgia, cluster headache, cervicogenic headache, trigeminal neuralgia, migraine, and tension-type headache. The target area for the GON block, when applied under ultrasound guidance, is the fascia between the obliquus capitis inferior (OCI) and semispinalis capitis (SSC) muscles at the C1–C2 level. In the literature, trigger points in the OCI and SSC muscles have also been shown to be associated with headaches (Tang et al., 2019; Travell and Simons, 1999). At this point, we would like to emphasise that three points can be treated with an injection into the trigger points of these two muscles during the GON block. It has also been stated that myofascial pain syndrome may cause entrapment neuropathies by increasing interfascial pressure (Baek et al., 2018). Based on this, while blocking the nerve between the fascia of these two muscles, the interfascial pressure can be reduced by injecting the trigger points of both muscles, and the entrapment of the nerve can be reduced. It is thought that corticosteroids added to local anaesthetics during a GON block do not provide additional benefits (Velásquez-Rimachi et al., 2022). It has also been reported that lidocaine injections directed at myofascial trigger points in the pericranial muscles may be effective in patients with headaches (Karadaş et al., 2013). From this point of view, it may be more appropriate to use lidocaine as the injectate when using the 3-in-1 injection technique.

The procedure involving the trigger points of the GON block, OCI, and SSC muscles can be performed under ultrasound guidance. The ultrasound probe is positioned transversely to the skull base. The probe is shifted inferiorly to identify the bifid-looking C2 spinous process. The probe is then moved slightly laterally, the lateral side of the probe is rotated toward the C1 transverse process, and the OCI is identified in its long axis. The OCI and SSC muscles, as well as the fascia between them, are identified, and the GON is visualised by tilting the probe (Tang et al., 2019).



GON – greater occipital nerve; **M** – medial; **OCI** – obliquus capitis inferior muscle; **SSC** – semispinalis capitis muscle.

Fig. 1. Image obtained by positioning the probe between the spinous process of the C2 vertebra and the transverse process of the C1 vertebra. The needle orientations for the three different procedures are indicated by arrows

The needle is then guided from lateral to medial using the in-plane technique, and the trigger point in the OCI muscle is injected. Next, the needle is directed to the GON, and nerve blockage is performed. Then the needle is directed into the SSC muscle for trigger point injection. Thus, three points are treated with one needle (Fig. 1).

As a result, the trigger points of these two muscles can be taken into consideration during a GON block applied for the treatment of headaches, especially occipital neuralgia.

Conflict of interest

The authors do not report any financial or personal connections with other persons or organisations which might negatively affect the content of this publication and/or claim authorship rights to this publication.

Ethics statement

Written and verbal consent was obtained from the patient regarding the ultrasonographic image obtained.

Author contribution

Original concept of study: BTD, MO, FB. Collection, recording and/or compilation of data; writing of manuscript: BTD, MO, BA. Analysis and interpretation of data: BTD, BA, FB. Critical review of manuscript: FB. Final approval of manuscript: BTD, MO, BA, FB.

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DOI: 10.15557/AN.2024.0025 AKTUALN NEUROL 2024, 24 (4), p. 166–168