Agri 2020;00(0):00–00
doi: 10.14744/agri.2020.08831

LETTER TO THE EDITOR

UNCORRECTED PROOF

Ultrasound-guided interfascial blocks of the trapezius muscle for cervicogenic headache: A report of two cases

Servikojenik baş ağrısında ultrason eşliğinde yapılan trapezius kası interfasiyal bloğu: İki olgunun sunumu

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To the Editor,

Cervicogenic headache (CEH) is a headache arising from cervical nociceptive structures such as facet joints, disci intervertebrales, muscles and ligaments. The structures that are innervated by the segmental nerves from C1-C3 can be sources of CEH. The nucleus trigeminocervicalis is formed by the pars caudalis of the spinal nucleus nervi trigemini, and the grey matter from the upper three cervical spinal cord segments. The nociceptive afferents of the nervus trigeminus, and the first three cervical nerves interact in this region. This interaction can result in referred pain that is felt in the sensory receptive fields of the nervus trigeminus and is a possible mechanism of CEH.[1–3] CEH is mostly a unilateral headache without side shift. It is typically referred pain from a source in the neck and radiates to one or more regions of the head and/or face. The most commonly affected regions are the occipital, frontal and retro-orbital regions. It can also occur bilaterally. CEH can be provoked by cervical movements[4,5] and be accompanied by limitations in neck movement and sometimes ipsilateral non-radicular shoulder and arm pain.[3,6] The prevalence of CEH in the general population is between 0.4–2.5%. However, in patients with headaches, the prevalence is as high as 15–20%.[7]

The Cervicogenic Headache International Study Group (CHISG) has published diagnostic criteria for CEH, also known as Sjaastad criteria.[5,8,9] CHISG Diagnostic Criteria for CEH include the following: (a) unilateral pain (although bilateral CEH may ocur); (b) restriction of range of motion of the neck; (c) provocation of head pain by neck movement; (d) provocation of head pain with external pressure over the upper cervical or occipital region on the symptomatic side; (e) vague ipsilateral non-radicular or occational radicular neck, shoulder, or arm pain; (f) confirmatory local anesthetic blocks in the cervical region; (g) marginal response to ergotamins, triptans, or indomethacin; and (h) posterior onset of headache pain.

Myofascial trigger points (TrPs) are common factors in patients with CEH and contribute to the pain and disability.[10,11] TrPs are painful, hyperirritable spots that localized in a taut band of skeletal muscle. They can give rise to localized or referred pain and autonomic phenomena such as vasoconstriction, pilomotor response, and hypersecretion.[12,13] The trapezius is one of the most affected muscles.[14]

The main goal of treatment is inactivation of the TrPs, and injection techniques are a main method. The structure of the fascia can ease diffusion of an injected anaesthetic during diagnostic and therapeutic blocks, and interfascial injections are becoming more common.[14–16] New knowledge about the function and anatomic content of the fascia have enhanced utilization of the interfascial block during anaesthesia and pain treatment.[14]

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Submitted: 23.06.2020 Accepted after revision: 22.07.2020 Available online date: 06.08.2020

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In this report, we present two patients with CEH who had TrPs in their upper trapezius muscles. Each patient received an ultrasound-guided interfascial block of the trapezius muscle. No studies to date have reported the effectiveness of such blocks in patients with CEH and exhibiting active TrPs in the trapezius muscle.

Case Reports

Case 1 – A female patient in her 70s presented with a complaint of headache of four years duration. Her headache was on the left side, could be provoked by cervical movements, and was accompany by limitations in neck movement and ipsilateral non-radicular pain in her left shoulder. The pain duration was geneally between five hours and three days. Her Numerical Rating Scale (NRS) score for pain intensity was 10. We determined a trigger point in her left upper trapezius muscle. Brain magnetic resonance imaging did not reveal secondary causes of the headache and she did not have neurological impairment. Because the patient was not treated with medication or physical therapy, we performed an ultrasound-guided interfascial block of the trapezius muscle.

The procedure was performed in the operating room with the patient positioned in the prone position. Standard monitoring (electrocardiography, non-invasive blood pressure, and peripheric oxygen saturation) was utilised and an IV catheter put in place. The skin area was aseptically draped with sterile towels and anesthetized with 2% prilocaine. We used a Logiq P5 ultrasound (Avante Health Solutions, Concord, North Carolina, United States) with the linear probe at 6–13 MHz. The probe was placed longitudinally between the acromion and the C7 spinous process. The trapezius and levator scapula muscles and their fasciae were visualized. The injection was made between the trapezius muscle and the levator scapula muscle fascia. A disposable 22 gauge, 10 cm quincke-tip spinal needle was inserted in the interfascial plane. The needle was connected through a 25 cm flexible extension tube to a syringe with physiological saline solution (PS) and 2 to 3 mL of PS was injected. The needle was repositioned until anechoic diffusion was observed. When the correct space was confirmed, the syringe was changed and 10 ml of 0.125% bupivacaine was injected between the muscle fascia. Following treatment, the cannula was removed and a sterile adhesive plaster was placed over the puncture site. Her NRS score at 30 minutes after the procedure was 2. There were no complications during the procedure, and the patient had no complications and was pain free during the two month follow-up period.

Case 2 – A female patient in her 50s presented with a complaint of headache of one year duration. Her headache was on the left side, could be provoked by cervical movements, and was accompanied by limitations in neck movement. Her pain duration was generally between five hours to three days. Her Numerical Rating Scale (NRS) score for pain intensity was 8. We determined a trigger point in her left upper trapezius muscle. Brain magnetic resonance imaging had revealed no secondary causes of the headache and she had no neurological impairments. Because the patient was not treated with medication and physical therapy, ultrasound-guided interfascial block of the trapezius muscle was planned.

We performed the same procedures as described above to the patient's left side. Her NRS score at 30 minutes after procedure was 3. There were no complications during the procedure, and the patient had no complications and was pain free during the two week follow-up period.

Both patients consented to the publication of the report.

Discussion

Sjaastad et al. have shown that the symptoms of CEH can be induced by firm manual pressure on "certain tender spots in the neck".[17] Zito et al. showed that incidence of tightness in the upper trapezius, levator scapulae, scalenes and the suboccipital extensors was statistically higher in a CEH group than in migraine and control groups.[18] Fernandez-de- las-Penas et al. suggested that pain from TrPs in the posterior cervical, head, and shoulder muscles typically refers to the temporal and frontal areas of the head.[19] Oliver et al. investigated whether trigger point sensitivity in the upper trapezius, sternocleidomastoid, temporalis, or posterior cervical muscles is a differentiating factor between cervicogenic and non-cervicogenic headaches.[10] Their study found that

myofascial TrPs in the upper trapezius muscle are more sensitive in patients with cervicogenic headache than in those with non-cervicogenic headache.

Inactivation of TrPs to restore normal muscle length and function is the corner stone of pain relief. Injection techniques are one of the main treatment methods for painful TrPs. and include methods such as local anaesthetic injections, dry needling and interfascial plane blocks.[20] Fascia consist of undifferential mesenchymal tissue and form a thin layer between muscles and adjacent organs. This layering creates interfascial space, resulting in a separative compartment between muscles, allowing independent movement of muscles and fibers, and providing circulation support, and protection.[21] This space is also useful for the administration of analgesic agents. Park et al. found that tone and stiffness of the suboccipital muscles and upper trapezius muscle was increased in patients with CEH compared to healthy subjects.[22] Blocking of nerve fibres by interfascial injection decrease the sensitivity and relax the muscles and provide pain relief to patients with TrPs.[14]

Various interventional approaches for CEH such as local injection, nervus occipitalis major and minor block, cervical epidural steroid injection, radiofrequency treatment, and dry needling have been reported in the literature.[23–27] Ischemic compression may also reduce pain in patients with CEH originating from TrPs in the sternocleidomastoid muscle.[28] Recently, interfascial injections have been used to pain relieve TrPs pain.[14,16] However, there are no reports in the literature regarding interfascial blocks specifically for cervicogenic headache. Therefore, our use of an ultrasound-guided interfascial block of the trapezius muscle for relief in patients with CEH may contribute to the literature.

The use of ultrasound to assist in interventional techniques has become common. Imaging techniques have provided both effective technique and increased complications.[29] Ultrasound-guided hydrodissection techniques can identify the shape of interfascial spaces, e.g., fusiform, and the occurrence of anechoic diffusion; we used hydrodissection to visualize the interfascial needle placement. Using cadavers, Domingo et al.[14] confirmed diffusion of saline solution in the interfascial space during an ultrasound-guided interfascial block of the trapezius muscle. They also showed a rich innervation network penetrating to fascia in interfascial space, clarifying the effect of local anaesthetic on myogenic pain. In an accompanying, clinical study, the authors also found the interfascial block in the trapezius muscle to be as effective as in abdominal muscles. Similar to our results, the Domingo et al. study reported preinjection mean VAS of 6.4 (at rest) and 7.6 (in motion), and postinjection mean VAS of 1 (at rest) and 1.6 (in motion).

In the present multiple case report, we present our use of ultrasound-guided interfascial blocks of the trapezius muscle in two patients with CEH. We suggest that this treatment may produce positive effects for patients with CEH caused by trigger points. Further follow-up studies are needed to reveal long-term outcomes of interfascial blocks of the trapezius muscle and other TrPs for relief of CEH.

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