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CORRESPONDENCE

Ultrasound-guided trigeminal nerve block: A new technique via the pterygopalatine fossa

Trigeminal neuralgia (TN) is a neuropathic pain syndrome which, in the first instance, is usually managed by pharmacotherapy with medications such as carbamazepine and oxcarbazepine. Non-pharmacological therapy may be necessary, and this can be combined with medications at any stage of the treatment, especially in cases of refractory TN.[1] We used ultrasound-guided trigeminal nerve block via the pterygopalatine fossa (PPF) on an 80 year-old Korean male suffering from TN. The patient was safely managed without any medication for TN. This was the first case in Korea treated in this way. It may be a feasible, safe and effective therapeutic option for TN and atypical facial pain, especially those that do not respond to pharmacologic therapy.

An 80-year-old man with TN was admitted to hospital with tuberculous pleurisy. He had been diagnosed with trigeminal neuralgia previously and suffered sharp stinging needle-like pain, aggravated by washing his face and chewing food, in his left jaw many times a day for 20 years except some pain-free intervals without any previous specific treatment. The intensity of his pain was graded as 10/10 on the Visual Analog Scale.

The patient had acute myocardial infarction 7 years ago requiring coronary stent placement. He was also diagnosed with diabetes 5 years ago and benign prostatic hyperplasia recently. He was on multiple medications including aspirin, vildagliptin, metformin ± voglibose, finasteride, naftopidil, anti tuberculosis medications viz. isoniazid, rifampicin, ethambutol and pyrazinamide and pyridoxine. He was unable to tolerate analgesics such as Ultracet ER® because of nausea and vomiting and was subsequently referred to a pain specialist.

Considering his medical history and current medications, he was treated with trigeminal nerve block using 5 ml of 0.125% bupivacaine (Pucaine®, Ryeon Pharmaceutical Co., Ltd, Korea) and 2.5 mg of dexamethasone under ultrasound guidance via the PPF. On subsequent injections, 5 ml of 0.25% bupivacaine and 5 mg of triamcinolone deacetonide were used (Figure 1). After about ten injections at intervals of three to seven days, the patient felt considerable pain relief and was able to chew food with only slight pain at the beginning of the masticatory movement. Pain was relieved by 90% compared to the initial visit to the pain clinic.

Although TN is mainly managed by medical therapy, interventional ablative therapy may be used in combination with TN medication.[1] For example, radiofrequency therapy (RFT) to reduce ectopic neural activity is a proven efficacy and widely used treatment for TN.[2] However, targeting the foramen ovale (FO) for RFT requires radiological visualization and may take some time, depending on practitioner's skills and patient's anatomy. Several minutes are also required for cannulation of the FO and at least 3 minutes for radiofrequency heat lesioning.[2] Time may also be spent on sterilizing and draping the puncture site as in surgery. Furthermore, during fluoroscopic imaging, the practitioner may be exposed to radiation.

Ultrasound-guided trigeminal nerve block was found to be safe, effective, rapid, radiation-free and feasible at hospital outpatient clinic.[3] It was an indirect approach to trigeminal nerve in a certain sense to be performed not via FO but via PPF. [3]

The PPF is bordered by the maxillary bone anteriorly, the palatine bone anteromedially and medially, and the palatine plates posteriorly.[3,4] The pterygopalatine ganglion (PPG) is located deeply in there as a complex neural center predominantly composed of maxillary nerve sensory fibers. It is linked to the orbit, mucous membrane, palate, uvula, tonsils, incisive canal, nasal cavity, taste receptors of the palate by a nerve network.[3-8] The foramen rotundum that opens onto the trigeminal ganglion in the middle

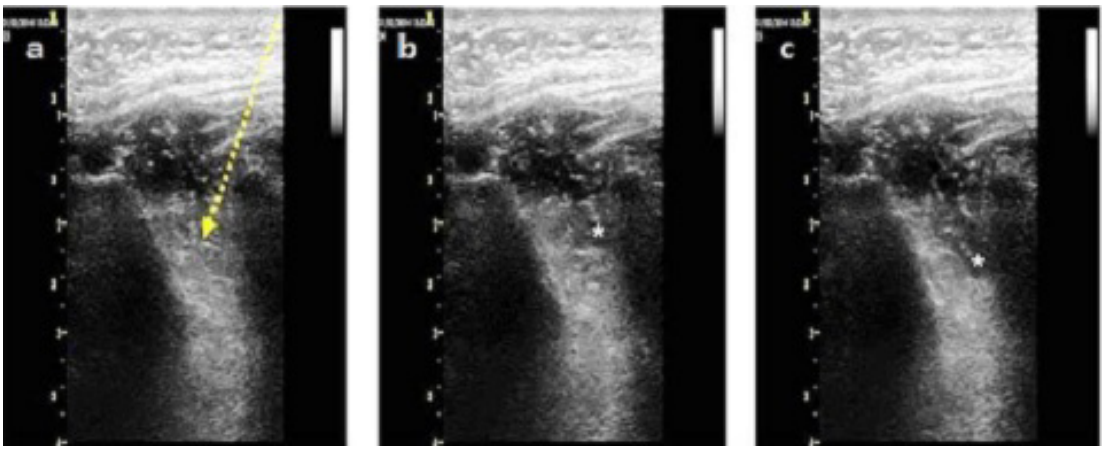

Figure 1. Sequential ultrasonographic images of trigeminal nerve block via pterygopalatine fossa. (a) A dotted arrow shows the needle (25G) pathway within the ultrasound plane. (b, c) Sequential images during injection capture the spread of local anesthetic solution (*).

cranial fossa is closely located to the PPF.[3,4,9] Trigeminal nerve block is achieved by the injectate which passes posteromedially through the foramen rotundum and retrogradely reaches the trigeminal ganglion. Two mL of contrast injected into PPF is sufficient to reach the middle cranial fossa, as confirmed by fluoroscopy.[3] In addition to trigeminal nerve block, pterygopalatine (sphenopalatine) ganglion block has been used for various pathologic conditions including TN, atypical facial pain, acute migraine, acute and chronic cluster headache, herpes zoster opthalmicus, and other facial neuralgia.[3,5]

Ultrasound-guided trigeminal nerve block in our elderly patient provided pain relief without any medication for a four month follow-up period. Therefore, ultrasound-guided trigeminal nerve block can be considered as a valuable alternative treatment for TN.

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