

Two Cases of Glossopharyngeal Neuralgia Successfully Treated with Pulsed Radiofrequency Treatment

Dear Editor,

Glossopharyngeal neuralgia (GPN) is an uncommon cause of facial pain with a crude incidence rate estimated to be 0.7 per 100,000 yearly.¹ GPN incidence is only 0.2% to 1.3% that of the more known facial pain entity trigeminal neuralgia.² The character and distribution of pain is often diagnostic; shooting from the pharynx, tonsil, and posterior base of tongue upwards to the Eustachian tube and inner ear or to the mandibular angle.³ GPN can be categorised as either primary or secondary GPN.³ Surgical treatment has traditionally been described to be more successful than nonsurgical treatment, but is unfortunately reported with higher rates of mortality and morbidity.^{3,4}

Pulsed radiofrequency application (PRF) is a non-destructive neuromodulatory method that can be used to treat neuropathic pain.⁵ Short pulses of radiofrequency energy, delivered at a constant temperature, produce central and peripheral neuromodulatory effects.^{6,7} Pulsed radiofrequency application (PRF) for secondary glossopharyngeal neuralgia had only been previously described by Shah et al⁸ in 2003. We present our experience with 2 patients with secondary glossopharyngeal neuralgia satisfactorily treated by PRF treatment of the glossopharyngeal nerve.

All patients presenting to our hospital with refractory facial neuralgias receive a multidisciplinary assessment,

with complete neurological evaluation and magnetic resonance imaging. Written consent for glossopharyngeal nerve PRF was obtained after the diagnosis of GPN was made. PRF treatment of the glossopharyngeal nerve was performed under fluoroscopic guidance. After skin preparation and local anesthetic infiltration, a 22G 45 mm insulated radiofrequency needle with 5 mm active tip was advanced in a medial direction (C-arm in lateral orientation) until bony contact with the styloid process was made. The needle was then walked off the posterior portion of the styloid process and advanced another 0.5 cm medially (Fig. 1). An antero-posterior check view shows the tip of the needle just medial to the styloid process. Figure 2 gives a pictorial representation of how the technique was performed. Sensory stimulation at 50 Hz up to 0.5 V was used to reproduce concordant pain at the base of the tongue, pharynx, and tonsils. Motor stimulation up to 1.0 V at 2 Hz was negative. Contractions of the muscles innervated by the phrenic and spinal accessory nerves were absent. Both patients remained haemodynamically stable without any bradycardic or hypotensive episodes. Pulsed radiofrequency application was then initiated at 45 V, 4 Hz and 10 milliseconds for 6 min after positive sensory stimulation. We do not routinely give local anaesthetic or steroid solutions at the final needle tip position because of

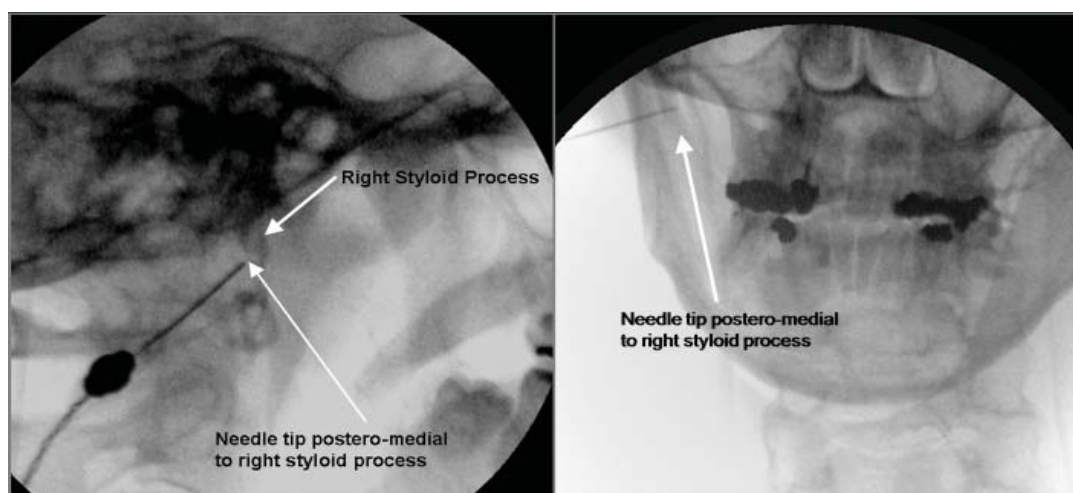


Fig. 1. Lateral view of needle entry towards styloid process. Antero-posterior check-view after needle is walked off the styloid process posteriorly.

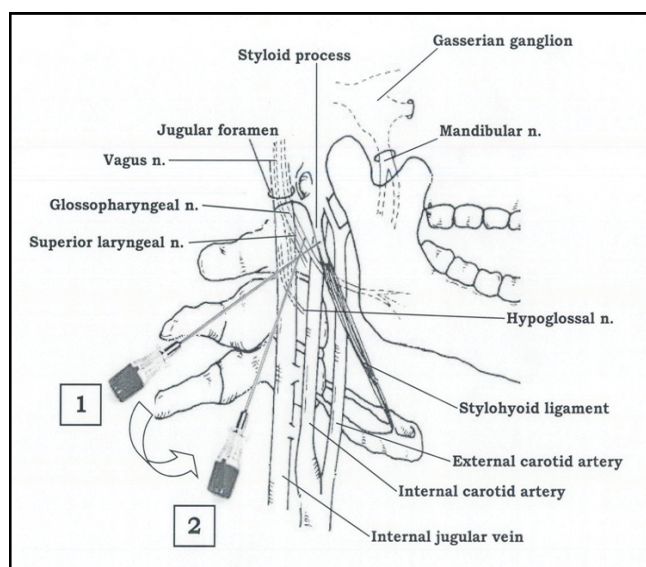


Fig. 2. Anatomical relations of the glossopharyngeal nerve at the styloid process. The glossopharyngeal nerve, the vagus and the hypoglossal nerve course behind the styloid process. The glossopharyngeal nerve then crosses the stylohyoid ligament and the stylopharyngeus (SPM) muscle. 1. Initial needle-tip position on styloid process; 2. Final needle-tip position on glossopharyngeal nerve.

the vascularity in this area. Both patients were followed-up for efficacy, side effects and complications on a regular basis up to their follow-up consultation 2 months later. Long-term follow-up was conducted by an assistant who was not involved in patient selection and treatment via telephone 5 months after the procedure.

Patient 1

The first patient was a 41-year-old woman who presented with a 15-year history of severe shooting pain from the back of her tongue to the back of her right ear. Her pain started after a hyperextension-type neck injury during a roller-coaster ride when she was 25 years of age. Her pain was initially unilateral and resembled an earache at its onset. However, it soon became bilateral and increased in intensity and frequency. Her paroxysms occurred as often as 5 times per week and would last about 1.5 hours each time. The paroxysms were triggered by touch, cold or chewing. She had consulted a number of neurologists, dentists and pain specialists and had been previously diagnosed with trigeminal neuralgia and third occipital neuralgia. Medications such as carbamazepine, gabapentin and amitriptylline have been tried without much efficacy. Procedures targeting the trigeminal ganglion and cervical zygapophysial joints had been performed but with limited success. Her last interventional procedure was more than

2 years ago. Sensory stimulation at 50 Hz at 0.15 V during the current treatment procedure reproduced her pain on the right side and particularly at the back of her tongue. Pain relief was reported the very next day after the procedure. The pain to her left ear had also disappeared completely and she has had only one paroxysmal attack during the first week after the procedure. Over the next 5 months, she has been completely pain-free and had not required any additional pain medications.

Patient 2

The second patient presented with a complex pain history of more than 40 years. Her pain started shortly after tonsillectomy at the age of 7 years. She described her stabbing pain as severe and extremely disabling. The pain started at the back of her throat and radiated to the angle of the mandible, ear and frequently also involves the maxillary region on the right side of her face. In the last 10 years, the pain also radiated to the upper part of her neck and was often accompanied by an occipital headache. The paroxysmal pain attacks occur at a frequency of 2 to 3 times each week. The paroxysms happen spontaneously with no recognizable triggers and would last up to 3 days each time they occurred. She had been treated with numerous anti-convulsants, antidepressants and analgesics which included carbamazepine, pregabalin, amitriptylline, gabapentin and tramadol. There was initial efficacy with gabapentin but her paroxysms got worse after about 6 months of treatment. She had never undergone any procedures for her pain.

Sensory stimulation at 50 Hz up to 0.2 V reproduced the pain at the angle of the mandible and the back of her throat. An overall reduction in pain intensity and paroxysm frequency was reported about 2 weeks after the procedure. The pain from the back of the throat to the mandible as well as the occipital headaches had almost completely resolved. Telephone consult another 4 months later confirmed the persistence of the pain relief to the same areas.

Discussion

Percutaneous radiofrequency thermocoagulation of the glossopharyngeal nerve has been successful in treating primary and secondary GPN.^{3,8} However, in practice, bradycardia and arterial hypotension may prevent a complete ablation of the nerve due to vagal stimulation.³ In addition, all neural destructive or ablative procedures carry the risk of neuritis, deafferentation pain, and neurovascular injury.⁹ Radiofrequency thermocoagulation of the glossopharyngeal nerve, in addition, carries the hazard of potential damage to the vagus nerve.¹⁰ Vagal nerve damage or stimulation can cause severe haemodynamic problems, such as syncope, asystole, or bradycardia¹¹ and it is for this reason that we

stress the importance of haemodynamic monitoring during such interventional procedures. Secondary GPN presents with comparable pain severity and disability as primary GPN. However, surgical methods like microvascular decompression (MVD), that has been advocated as a sole treatment for primary GPN,^{4,12} is not applicable to secondary GPN.⁸ Apart from an inherent 5% risk of mortality,^{3,8} MVD is also not a treatment option in Patient 1 who has bilateral GPN.

PRF of the glossopharyngeal nerve is a minimally invasive, non-destructive, neuromodulatory method. It can be performed safely in an extra-oral, postero-medial styloid approach in the presence of close haemodynamic monitoring. Though experimental at this point in time, our case report suggests that PRF treatment of the glossopharyngeal nerve might be a potential alternative to other percutaneous techniques and surgical options for patients with secondary GPN.

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