

## CASE REPORT

# Management of an Atypical Case of Recurrent Trigeminal Neuralgia, switching from V2 to V3 Division: A Case of Resistant Trigeminal Neuralgia

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## ABSTRACT

Trigeminal neuralgia (TN) is a neuropathic pain syndrome characterized by severe unilateral paroxysmal facial pain. Pain attacks are usually stimulated by tactile irritation within the region of the trigeminal nerve. Trigeminal neuralgia pain typically remits and relapses, even when patients are on conventionally used treatments, resulting in a major source of disability and poor quality of life. Multiple forms of treatment are available for its management, but it is often resistant to conventional treatments. Radiofrequency (RF) ablation is one of the best treatment modalities to relieve pain in TN but even after successful RF ablation of Gasserian ganglion, there may be relapses. Rarely, patient may present with pain in other distributions of trigeminal nerve. We report a case of a 55-year-old female having relapsing form of TN, switching from V2 to V3 division of trigeminal nerve distribution.

**Keywords:** Gasserian ganglion, Radiofrequency ablation, Trigeminal neuralgia.

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## INTRODUCTION

Trigeminal neuralgia (TN) is defined by the International Association of the Study of Pain as “a sudden, usually unilateral, severe, brief, stabbing, recurrent pain in the distribution of one or more branches of the 5th cranial nerve.”<sup>1,2</sup> It occurs with a prevalence of 3 to 5 per 100,000 people in the general population<sup>3</sup> and affects primarily women over 50 years of age.<sup>4</sup> Etiology can be compression by a vascular loop (classically) or by major neurological condition (secondary), such as tumor or multiple sclerosis.

Trigeminal neuralgia can be presented with acute or chronic pain depending on the cause, which varies with the patients. Chronic pain differs greatly from acute pain in terms of the pain persistence and adaptation. It is associated with poor activity of daily living, suicidal attempts, and an overall decreased quality of life due to the unbearable pain.<sup>5</sup> Pharmacological treatment is effective only in 60% of patients, and interventional management must be considered for the remaining cases. Gasserian ganglion thermal radiofrequency (RF) is a relatively noninvasive and effective option.<sup>4</sup> Thermal RF ablation of the Gasserian ganglion is associated with the highest rates of complete pain relief.<sup>6</sup> We report an atypical case of relapsing TN and area of pain distribution being switched from V2 to V3 division of trigeminal nerve.

## CASE REPORT

A 55-year-old female presented with complaint of electric shock-like sensation over right side of the face mainly involving right nasal area, upper jaw, cheek, and upper lip. This electric shock-like pain was aggravated by chewing and brushing. With time, this complaint progressed to such extent that she had similar sensation even on speech. On examination, facial sensation was normal and no facial weakness was evident. Extraocular muscles were found to be normal functioning. Power and tone were found to be adequate. Rest of the other neurological examination was found to be normal. Magnetic resonance imaging (MRI) revealed vascular loop from right superior cerebellar artery crossing root entry of right trigeminal nerve (Fig. 1).

A diagnosis of TN involving maxillary division of right side was made. She was prescribed carbamazepine and gabapentin tablet and microvascular decompression (MVD) of vascular loop was advised. Patient refused to undergo MVD. So the consulting physician planned to do RF ablation of right Gasserian ganglion and she agreed. Under all aseptic precaution, foramen ovale was identified using fluoroscopic guidance. Thereafter, RF ablation of Gasserian ganglion was performed after adequate test stimulation, i.e., sensory stimulation at 0.6 vs 50 Hz and motor stimulation at 1 vs 2 Hz. Patient had near-complete relief of pain for 3 years.

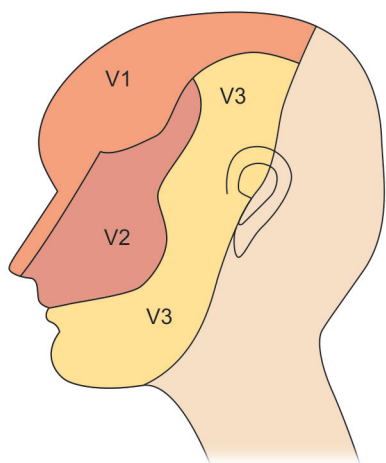
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**Fig. 1:** Areas of distribution of trigeminal nerve

After 3 years, there was recurrence of pain in the same region associated with nausea and vomiting and this pain aggravated on chewing and on conversation. Again, MRI was done and she was advised to undergo MVD, but again she refused. So, for the second time, RF ablation of right Gasserian ganglion was repeated and she had approximately 80% pain relief. This pain relief lasted for 6 months. After 6 months of previous RF, patient complained of similar sensation involving upper jaw spreading to forehead (numeric rating scale 7), attacks came in clusters of five to six episodes, each lasting for few seconds. So a diagnosis of recurrent TN involving right V1 and V2 division was made. Radiofrequency ablation of Gasserian ganglion was repeated after adequate manipulation of needle and patient had approximately 75% pain relief.

After 3 months, patient returned with similar complaint of electric shock-like sensation on right side of face but the areas involving were lower part of jaw, cheek, and around tragus of ear. All other neurological examination were normal. Again, RF ablation of right Gasserian ganglion was done using six cycles and tablet carbamazepine was prescribed. Now, the patient had near-complete relief of pain.

## DISCUSSION

The ultimate goal of any treatment is to reduce pain and relieve symptoms. The first line of treatment for TN is the used anticonvulsant drug, carbamazepine.<sup>5</sup> But medical form of treatment is effective only in 60% of patients, with their effectiveness dropping substantially in the long term. When drug therapy fails or gives rise to significant adverse effects, interventional treatment must be taking part. It has been shown that the earlier the intervention is performed, the better the long-term prognosis.<sup>4</sup> Radiofrequency ablation is an effective, accurate, and precise procedure that provides efficient

pain relief to TN sufferers. Studies show that RF ablation provided a high initial pain relief, with a pain-free rate of 50.4% after a 5-year follow-up.<sup>5</sup> The procedure is called RF because it uses the same frequency as an amplitude modulation radio, which is approximately 500 kHz of electromagnetic radiation.<sup>7</sup> Side effects and complications can best be evaluated in a large population study. Kanpolat et al<sup>8</sup> reported the results of 25 years' experience with 1,600 patients, and 2,138 RF treatments of the Gasserian ganglion mentioned decreased corneal reflex (5.7%), weakness and paralysis of the masseter muscle (4.1%), dysesthesia (1%), anesthesia dolorosa (0.8%), keratitis (0.6%), and temporary paralysis of the third and fourth cranial nerves (CNs; 0.8%).<sup>9</sup> There are two types of RF currently in use. Continuous RF is a RF procedure using a constant output of high-frequency electric current to produce temperatures of 45°C or more (the temperature at which permanent nerve damage occurs), resulting in neuroablative thermocoagulation. For this patient, conventional RF ablation was done for the areas involving V3 branch of trigeminal nerve. Before that, this patient had underwent RF ablation of Gasserian ganglia for the areas involving V1 to V2 branch of trigeminal nerve. Pain relief was there for 3 months, but after 3 months, patient came again with the similar complaint in the areas involving V3 of trigeminal nerve. The success rate of RF in TN is high, but in this patient, there was switching of pain along the nerve distribution region, i.e., V2 to V3 after 3 months, producing similar symptoms.

For this patient, the etiology was confirmed by MRI, there was vascular compression of the nerve. In other words, we can say neurovascular compression syndrome (NVCS). Neurovascular compression syndrome is defined as a direct contact with mechanical irritation of CNs by blood vessels the most is artery.<sup>10,11</sup> The most common cause of TN is NVCS and this is also matching with this patient. In our patient, only neurological compression by superior cerebellar artery was there. Neurovascular compression syndrome of fifth CN is usually caused by a neighboring elongated superior cerebellar artery coming from above or by an anterior inferior cerebellar artery (AICA) coming from below, with the superior cerebellar artery being more common (88% alone or in association) than the AICA ( $\leq 25\%$ ). Both the superior cerebellar artery and AICA usually compress the nerve in its superomedial portion (60%).<sup>10</sup>

Patients with "classic" or "idiopathic" TN have only recurrent episodes of stabbing pain in the territory of V1 or V2. But our patient had recurrent pain from V2 to V3 area. Our hypothesis is that the changes of pain area to V3 region might be because of slight alteration in vascular compression leading to change in course of nerve compression, resulting in the symptoms of affected area.

## CONCLUSION

On rare occasions in classic TN patients, course of trigeminal nerve may be altered by the change in pressure of compressing vessel, which may clinically manifest as symptoms, switching from one area to others. Magnetic resonance imaging should be repeated and it should be differentiated from previous MRI findings to find out the actual site of compression in such cases.

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