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Refractory Trigeminal Neuralgia Treatment with Cryoneurolysis in a Patient with Idiopathic Thrombocytopenic Purpura: A Case Report

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Background: Trigeminal neuralgia is a debilitating facial pain condition. Managing trigeminal neuralgia in patients with co-existing conditions like idiopathic thrombocytopenic purpura, which increases bleeding risk, presents a significant clinical challenge, especially when considering interventional procedures.

Case Report: We present the case of a 54-year-old woman with refractory right-sided trigeminal neuralgia and idiopathic thrombocytopenic purpura. Due to her idiopathic thrombocytopenic purpura and a new acute cerebrovascular accident, she was not a candidate for microvascular decompression. Initial gamma knife treatment provided only transient relief. Because of her bleeding risk, less invasive peripheral trigeminal branch blocks were performed, followed by cryoneurolysis of the infraorbital and mental nerves, which provided significant and sustained pain relief for 11 months.

Conclusion: This case highlights that for patients with trigeminal neuralgia who have a high bleeding risk due to conditions like idiopathic thrombocytopenic purpura, peripheral trigeminal branch blocks under ultrasound guidance, followed by cryoneurolysis, can be a safe and effective alternative to more invasive procedures, offering long-lasting pain relief.

Key words: Trigeminal neuralgia, idiopathic thrombocytopenic purpura, cryoablation, iovera

BACKGROUND

Trigeminal neuralgia (TN) is described as "recurrent unilateral brief electric shock-like pains, abrupt in onset and termination, limited to the distribution of one or more divisions of the trigeminal nerve and triggered by innocuous stimuli" (1). These symptoms cannot be better accounted for by another International Classification of Headache Disorders, 3rd Edition diagnosis. TN can develop without a specific etiology or it can be caused by another disease.

Classic TN refers to pain without any other etiology outside of neurovascular compression as seen on magnetic resonance imaging (MRI) or during surgery. Secondary TN refers to symptoms in a patient with a known disease that is found to be the etiology of these symptoms, such as multiple sclerosis or a tumor. Idiopathic TN refers to these symptoms without any electrophysiologic tests or MRI showing any significant abnormalities.

TN has a prevalence ranging from 0.03%–0.30% (2). The incidence of TN ranges from 11–42 cases per 100,000 people (2); these variations in prevalence and incidence can partly be due to a lack of diagnostic criteria consensus. It affects women more than men, individuals in their mid-30s to their mid-60s (2), and most commonly along the maxillary (V2) and mandibular (V3) branches (2). There seems to be a predominance of right-sided

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symptoms compared to the left though there are no anatomical reasons why blood vessel loops should be more frequent on the right compared to the left.

First-line medication management includes carbamazepine and oxcarbazepine followed by second-line options baclofen, lamotrigine, and pimozide (2). Third-line medications include levetiracetam, gabapentin, and pregabalin. Microvascular decompression is indicated for patients with few comorbidities or a known vascular compression who have failed medication management. For older patients with comorbidities, minimally invasive interventional procedures include an initial diagnostic trigeminal ganglion block. If the block is effective, subsequent radiofrequency ablation, balloon compression, chemodenervation, or cryoablation may be performed. High cervical spinal cord stimulation or peripheral nerve stimulation can also be considered in refractory cases.

Idiopathic thrombocytopenic purpura (ITP) is a condition of low platelet count without a known etiology. Normal levels are between 150,000–400,000/μL. Most cases are asymptomatic, although very low platelet counts can lead to an increased risk of bleeding and purpura. Platelet counts below 50,000 μL increase the risk of significant bleeding from trauma while counts below 20,000 μL increase the risk of spontaneous bleeding. The diagnosis is one of exclusion after other blood abnormalities and secondary causes are ruled out. Bone marrow examination is saved for those over age 60, for those who do not respond to treatment, and when the diagnosis is in doubt. Evaluation for antiplatelet autoantibodies is used for confirmatory purposes (3). Treatment is indicated for those with moderate or severe thrombocytopenia who are actively bleeding or at risk of bleeding.

Standard, initial treatment begins with corticosteroids. In patients unresponsive to corticosteroids, intravenous immunoglobulin is given. Platelet transfusions are frequently administered in these patients. If these treatment options fail, patients are candidates for splenectomy (4). This case report describes our TN treatment for a patient with ITP.

CASE PRESENTATION

A 54-year-old woman with a past medical history of idiopathic thrombocytopenic purpura presented with right-sided facial pain. She reported that the pain started in 2020 and was diagnosed as right-sided TN. She had been well managed with gabapentin until December of 2023. While eating, she lost a tooth which made her pain unbearable. Prior to this event, her pain was intermittent in nature, lasting a few seconds to a few minutes. After this event, the attacks became more frequent with more intense pain. She was evaluated by a dentist; her workup was unremarkable. Her primary care physician obtained a computed tomography (CT) maxillofacial scan with contrast medium that showed no explanation for her right-sided facial pain. She established care with neurology in February of 2024 and was started on carbamazepine and pregabalin which provided 20% relief. She was also started on tramadol; it provided no relief. She underwent a brain MRI with and without contrast medium; both showed no reason for her facial pain. As a result of her unremarkable workup, referrals to neurosurgery and pain management were made.

She established care with the neurosurgery department in April of 2024. A Gamma Knife® (Elekta, AB) procedure and a microvascular decompression (MVD) were discussed as treatment options. Given her history of ITP, a referral to hematology was made for platelet optimization. A brain MRI with and without contrast medium with trigeminal protocol was obtained for further surgical planning. The initial plan was to proceed with an MVD. Hematology clearance was obtained with recommendations for platelet transfusion prior to the MVD with hospital admission afterwards for monitoring. Her MRI with trigeminal protocol was completed on May 2, 2024; no trigeminal nerve abnormalities were found.

A subsequent head CT without contrast medium was performed for surgical planning on May 30, 2024. It showed a new area of low attenuation in the lateral right temporal lobe. After reviewing the images with the neurosurgeon, a diagnosis of recent ischemic stroke vs multiple sclerosis was considered and the patient was sent to the emergency department for a workup. She was admitted to the hospital and a CT perfusion of the brain and CT angiography of the head and neck showed no infarcts.

A subsequent brain MRI without contrast medium showed a small acute infarct in the right temporal lobe. Due to her acute cerebrovascular accident, she was deemed not to be a candidate for an MVD. Therefore a Gamma Knife procedure was performed on June 18, 2024. On follow-up with neurosurgery, she reported 100% relief for 2 days, however the pain returned on the third day with more frequent attacks compared to before. A neurology physician added pregabalin 50 mg twice a day to her medication regimen and stopped

the gabapentin. The pregabalin and carbamazepine combination provided approximately 20% relief.

Care at the Grace Pain Clinic began on August 7, 2024. Her pain was reproduced by palpation of the right infraorbital and mental foramen. She did not have pain along her upper and lower teeth or gums. Sensory to light touch was intact along the trigeminal nerve. Other cranial nerves were intact. Her platelet level was 72,000/µL. Based on this, her increased risk of bleeding, and the previous experience of the senior author (MRD), we offered an infraorbital and mental nerve block.

An in-office block, without ultrasound guidance, of the infraorbital and mental nerve was performed with one mL of 0.5% bupivacaine at each foramen using a 25G needle. Even with a small gauge needle, she had bleeding which required pressure to stop. Her pregabalin was increased to 225 mg twice a day. On follow-up, she reported 80% pain relief for 36 hours in the V3/mental region and ongoing 100% pain relief along the V2/infraorbital distribution. A repeat block with ultrasound was performed with 1 mL of dexamethasone 10 mg/mL and 1 mL of 0.5% bupivacaine over the mental foramen. Secondary to daytime drowsiness, her pregabalin dosage was adjusted to 150 mg in the morning and 225 mg in the evening.

After insurance approval, we scheduled the patient for cryoneurolysis of her right-sided infraorbital and mental nerve with the iovera° device (Pacira CryoTech, Inc). We performed the procedure on September 12, 2024. We used a sterilely prepped ultrasound machine to identify the right infraorbital foramen and mental foramen. Two cryo lesions were performed at each nerve.. We used the iovera° Smart Tip 309. It has 3 27G needles, each are 8.5 mm long and 8 mm wide. No complications occurred.

At follow-up, she reported ongoing 80%–90% pain relief and had completely stopped taking pregabalin. She continued to take carbamazepine 200 mg daily. On physical exam, she was noted to have a small area of numbness over her right mental foramen, but palpation along the V2 and V3 distribution produced no pain. On a follow-up phone call on June 2, 2025, she reported ongoing 80%–90% pain relief and continued to only take carbamazepine 200 mg daily. A subsequent follow-up phone call on September 10, 2025, she reported ongoing 90% pain relief and reported she had stopped taking carbamazepine. An explanation of the iovera° device's mode of operation was described in a previous case report by the senior author (MRD) (5).

DISCUSSION

Trigeminal neuralgia can be classified as either classic, secondary, or idiopathic; it should not be considered a blanket diagnosis for facial pain. The pain can be so debilitating that it can cause suicidal ideation. Treating TN can be further complicated by a patient's comorbidities, which in our patient's case was idiopathic thrombocytopenic purpura and the increased risk for bleeding with interventional procedures.

Current interventional treatments for TN are based on the symptoms' source. MVD is indicated in cases of neurovascular compression for those who are under 70 years old and fit for surgery. If not a candidate, radiosurgery—the Gamma Knife procedure–is an option (2). For patients with significant medical comorbidities who are not candidates for major surgery, percutaneous rhizotomy with glycerol, radiofrequency ablation, or balloon compression are options.

If pain is secondary to an injury to the ganglion, its nerves, or its branches–i.e., trigeminal neuropathy–a trigeminal ganglion block, followed by trigeminal

Fig 1. Cryoablation of the mental nerve. Note: this is not the patient described in the case report.

ganglion pulsed radiofrequency, should be considered. Successful peripheral branch blacks can be followed by pulsed radiofrequency or cryoablation if symptoms are in isolated nerve distributions. Neuromodulation is reserved for refractory cases; this includes peripheral stimulation of the trigeminal terminal branches and central stimulation which stimulates the motor cortex, deep brain, gasserian ganglion, or high cervical spinal cord.

No specific literature was found addressing treatment options for patients with TN and ITP. Our patient was initially cleared for an MVD with recommendations of platelet transfusion and hospital admission for monitoring. The decision to pivot to the Gamma Knife procedure occurred because of her ensuing cardiovascular accident. Given the distribution of her pain and her potential for increased risk of bleeding with additional invasive procedures, we proceeded with an infraorbital and mental nerve block. Because she received significant pain relief from these blocks, cryoablation was performed.

As stated earlier, our patient continues to get ongoing 90% relief at 12 months postprocedure. She has been weaned off all medications for her facial pain. She mentioned, prior to her procedure, that she was mostly homebound due to her excruciating pain, which kept her from shopping and having meals with her family like she used to. Her pain severely affected her sleep and quality of life, both of which have improved tremendously since the procedure. She has weaned off any medications she took for sleep as well.

CONCLUSION

Trigeminal neuralgia can be challenging for physicians to manage. When compounded with idiopathic thrombocytopenic purpura, careful consideration must be taken to mitigate bleeding when considering minimally invasive interventional procedures. In cases where trigeminal ganglion blocks may have a bleeding risk that is too high, peripheral trigeminal branch blocks under ultrasound guidance can be performed with small-gauge needles. If the blocks are successful, cryoneurolysis of these nerves can be performed in order to provide long-lasting pain relief.

Contributions

The body of the text was written by AJS and edited by MRD.

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