



Injection of the Sphenopalatine Ganglion With C-Arm And Radiofrequency For Trigeminal Neuralgia

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Abstract: Trigeminal Neuralgia (TN) is the most severe pain in the world, where patients experience a painful condition from the face that significantly impacts the quality of life and socio economic function of affected patients. The pathophysiology of TN is still unclear, it is thought that TN occurs due to compression of *the root entry zone* of the trigeminal nerve near the origin of the brain stem and this local pressure causes demyelination which leads to abnormal depolarization which results in ectopic impulses. The sphenopalatine ganglion is a parasympathetic ganglion that is connected to the trigeminal, facial, and sympathetic systems and consists of somatosensory, sympathetic, and parasympathetic nerve fibers. This ganglion receives sensory impulses from around the face. TN Management can in a way pharmacological and surgical; however, it is not capable in a way of effectively relieving, since the technology of radiofrequency ablation, TN patients can be done with radiofrequency ablation with satisfactory results, even *one daycare*.

Keywords: Trigeminal Neuralgia, Sphenopalatine Ganglion, Radiofrequency

INTRODUCTION

The definition given by *the International Association for the Study of Pain (IASP)*, that pain is defined as "an unpleasant and negative sensory and emotional experience associated with actual or potential tissue damage", and the character of the pain depends on its location, type of dysfunction, specific area, and stage of disease. ⁽¹⁾

Interventional pain measures are a development of conventional pain management therapy. Some procedures can be carried out with simple techniques using anatomical markers, but with the development of technology today, it is possible to use imaging technology such as fluoroscopy, CT scans and ultrasonography in pain intervention procedures. By using advanced imaging modes, various interventional procedures such as nerve blocks, radiofrequency, and neurolysis can be performed with much greater precision and effectiveness.

Trigeminal Neuralgia (TN) is the most severe pain in the world, this was expressed by Peter J. Jannetta, MD with the term "*striking back*", a layman's experience for patients with facial pain. Trigeminal Neuralgia (TN) or *Tic Doloureux* or Fothergill's disease, and suicidal disease is a painful condition of the face and significantly impacts the quality of life and socioeconomic functioning of affected patients. ⁽²⁻⁴⁾

The prevalence of TN occurs in people over 50 years of age, with an annual incidence rate of around 4-5 new patients per 100,000. The highest incidence occurs between ages 50 and 70 years; in 90% of cases, symptoms begin after age 40. The incidence occurs more frequently in women than men with a ratio of 1.5:1. ^(1,2)

The pathophysiology of TN is still unclear, but based on clinical observations, TN occurs due to compression of the trigeminal nerve near the origin of the brain stem, which is called the root entry zone, by blood vessels or tumors, which can cause this TN. Local pressure will cause demyelination which leads to abnormal depolarization resulting in ectopic impulses. ^(2,4,5)

TN management carried out by medical personnel can in a way pharmacology and surgery. Because of drugs proven No capable in a way effective relieve the pain experienced TN patients and with the more development minimally invasive techniques especially since found technology radiofrequency ablation, then treatment TN patients can done with radiofrequency ablation without must do take care stay at home Sick (*one day care*). ^(1,2,4)

The sphenopalatine ganglion is a parasympathetic ganglion that is connected to the trigeminal, facial and sympathetic systems and consists of somatosensory, sympathetic and parasympathetic nerve fibers. This ganglion receives sensory impulses from the mucosal lining of the nose, maxilla, posterior ethmoid, sphenoid sinus, roof of the mouth, upper two-thirds of the tonsils, soft palate, most of the pharynx, nasopharynx, as well as taste nerve fibers from the anterior two-thirds of the tongue. Sensory nerve fibers join the maxillary nerve and the motor nerve root ganglion communicates with the fascial nerve via the superficial petrosal nerve.

This case report will discuss the action of sphenopalatine ganglion injection with radiofrequency in cases of chronic pain of Trigeminal Neuralgia. Hopefully this case report can provide an overview of the use of sphenopalatine ganglion injection and RF, especially in cases of pain that are difficult to treat.

Case Report

Patient identity:

Name : Mrs. DMS
Female gender
Date of birth : 56 years old
Address : Semarang

History:

Main Complaint: Facial pain recurs, especially when there is movement in the mouth or face.

History of Current Illness:

Since the past month, the patient has complained of pain on the right side of the face again, this happens like the previous complaint, where the upper lip, especially and the lower right, suddenly pulls and hurts, and feels numb. If the tongue is moved to the right side, the patient's ear will feel painful. Pain was also felt in the right temple to the right eye, right upper jaw and right lower jaw. This brought the patient back to the pain clinic. Complaints of pain occur in the lower and upper jaw, the pain occurs like pulling, electric shock and the tooth feels like it is going to fall out, occurs in the morning and lasts 1-2 seconds, but sometimes also occurs at night.

Two years previously, the patient complained of severe pain such as tingling, stinging like an electric shock in the right side of the face, this pain came and went, the duration of the attack was less than 2 minutes. The location of the pain occurs in the face, eyes, cheeks, upper and lower jaw on the right, because the pain gets worse until the patient feels like his teeth are going to fall out. Pain occurs on the right side of the face and is felt when there is movement on the face such as chewing and when touched.

Then the patient went to acupuncture to deal with the pain, and had several visits but there was no change, it even got worse. Then the patient went to a neurologist, then was given medication to drink carbamazepine 1x 1tab, Provallyin 1x 1tab PO and the pain was less, but several times the patient experienced relapses, then the neurologist referred him to a *Pain Intervention doctor*, to treat the patient's facial pain. Then 2 months ago the patient underwent an interventional Ganglion Gasserian Block injection, and the complaints were much reduced, you could say non-existent, but this only lasted 1 month and the complaints occurred again.

Previous disease patients:

The patient has no history of hypertension, stroke, asthma, allergies, blood clotting disorders and trauma.

The patient underwent a CT scan with results within normal limits. However, *Magnetic Resonance Imaging* (MRI) examination of the head has never been carried out.

Action history: Inj. Gasserian ganglio block (5/2021)

Physical examination:

Awareness : Compos mentis, GCS E4V5M6

General Condition : Moderate-severe pain appears

Weight / Hight : 56 kg / 157cm

Vital signs:

BP : 130/90 mmHg Pulse : 76 x/minute

RR : 18 x/min Temperature : 36.4 °C

SpO2 : 99% NRS : 8

Head : Normocephalic, distribution hair equally.

Eye : Eye symmetrical, No sclera icteric, No conjunctiva anemic, light reflex OK, isochore pupil

Nose : Normal Form, no deviated of septum

Ear : Normal form, no pain for compressed, tympanic membrane is intact

Mouth : Tonsils are within normal limits

Neck : No enlargement of gland thyroid, no enlargement of lymph nodes (KGB)

Thorax

Pulmo : Symmetrical chest wall movement, vesicular right is same with left, No Ronchi, no Wheezing

Cor : S1S2 are regular, No murmur, No gallop.

Abdomen : Bowel sounds are normal, flat tender, No pain

Extremities : Acral is warm, CRT < 2', no cyanotic and edema.

Supporting investigation: laboratory and X-ray (MRI) were not performed

Working Diagnosis: Trigeminal Neuralgia dextra

Governance: Pharmacological: Gabapentin 2x 300mg po, Bamgetol 2x 200mg po, Meloxicam 2x 7.5mg po

Pain Intervention: Inj. Sphenopalatine ganglion block with RF

Block & RF Procedure on Sphenopalatine Ganglion (7 July 2022, 13.00):

1. Prepare the tools: Fluoroscopy, Radiofrequency, Monitor
2. Prepare emergency tools and medicine
3. Place an intravenous line, oxygen, and monitor
4. Position the patient *supine* on the procedure table with fixation, mark the procedure area with a marker in the infrazygomatic area
5. Apply antiseptic measures to the area of action
6. Rotate the C-arm laterally to look for *superimposed images of the right and left mandibular rami*.
7. Rotate the C-arm slightly cephalad until you see an image of the pterygopalatine fossa *superimposed on each other* which looks like an inverted vase.
8. The patient is asked to close and open the mouth while feeling for the bulge at the anterior *thyromental junction* (TMJ) during joint movement, place a metal marker then confirm with a C-arm lateral view.
9. Infiltrate the procedure area with 1% lidocaine as much as 2 mL.



Figure 1. Metal marking of the pterygopalatine fossa with *guiding* C-arm.



Figure 2. Local anesthetic infiltration

10. Insert a 22 G RF needle into the pterygopalatine fossa little by little by *guiding* the C-arm.
11. After the needle is in the pterygopalatine fossa, the patient is asked whether he feels pain and in which area the pain is felt. →The patient feels pain in the nostril area.



Figure 3 Insertion of the RF needle into the pterygopalatine fossa with C-arm *guiding*.



Figure 4 (Top) Confirm needle position with C-arm in lateral position. (Below) The results of the fluoroscopy image in the AP position show that the needle is heading towards the pterygopalatine fossa

12. Confirm the position of the needle with the C-arm in the AP position. →The needle is confirmed to be in the lateral wall of the nasal alae
13. 0.4 mL of contrast fluid was injected →and the fluid filled the pterygopalatine fossa as seen in the AP and lateral fluoroscopy images.
14. A sensory stimulation test was carried out using a frequency of 50 Hz and starting from a voltage of 0.2 to 1 V. →The patient felt paresthesia in the nose at a voltage of 0.33 V.
15. A motor stimulation test was carried out using a frequency of 2 Hz and starting from a voltage of 0.2 to 1 V. →The patient felt contractions in the masseter muscle at a voltage of 0.625 V.

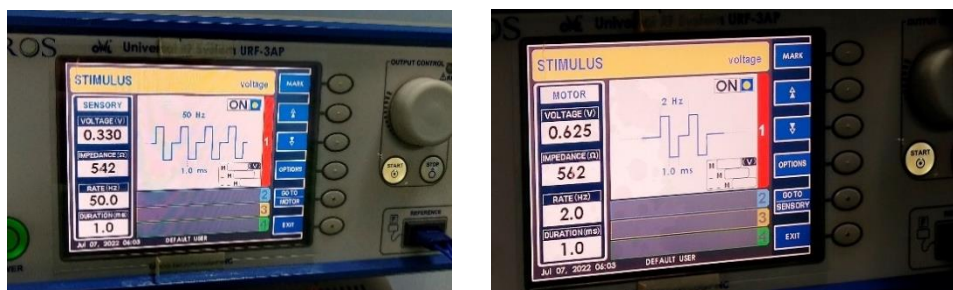


Figure 2.6 (left) Sensory test, (right) motor test

16. Inject 1% lidocaine 0.5 mL, wait 30 seconds
17. Perform radiofrequency thermoregulation, increase the temperature slowly then maintain it at 80 °C for 60 seconds



Figure 2.6 RF thermoregulation process

Patient Follow Up (8 July 2022):

- Subject: Pain is much reduced
- Object:
Awareness: compos mentis, GCS 15
Vital signs: BP 110/70mmHg, Pulse 82x/min, RR 18x/min, Sat O2 99%, T.36 C, NRS: 2
Pulmo: Right vesicular is the same as left, Rhonci and wheezing are absent
Cor: S1S2 single murmur is absent, gallop is absent
Abdomen: BU is normal, Soefel
Extremities: not cyanotic, no edema, CRT<2'
- Analysis: Post Intervention pain et causa Trigeminal Neuralgia dextra (V2-3)
- Plan: Patient can go home
Home medication: Carbamazepine 2x 200mg po, Gabapentin 2x 300mg po, Paracetamol 3x500 mg po
Control in 1 week

RESEARCH METHODS

Research methods This use approach studies case, Case study research can be used to study a variety of phenomena, such as human behavior, organizations, or events. Case study research can be used for exploratory, descriptive, or evaluative purposes.

FINDINGS AND DISCUSSION

Trigeminal Neuralgia

The trigeminal ganglion was first described by the Viennese anatomist Johann Gasser, since then it has often been called the Gasserian ganglion. This ganglion block was first described by Hartel in 1912. His technique is still the most commonly performed, with slight modifications.⁽¹⁾

The trigeminal nerve is the largest cranial nerve. The ganglion is located within Meckel's cave and contains the cell bodies of incoming sensory nerve fibers. The trigeminal ganglion is analogous to the dorsal root ganglia of the spinal cord. From the trigeminal ganglion, a single large sensory root enters the brain stem at the level of the pons. Directly adjacent to the sensory roots, smaller motor roots emerge from the pons at the same level. Motor fibers pass through the trigeminal ganglion on their way to peripheral muscles. Their

cell bodies are located in the fifth nerve nucleus, deep in the pons. The most significant parts of the trigeminal nerve are (1) the trigeminal nucleus and (2) the trigeminal ganglion. ^(1,2)

There are three main branches of the trigeminal ganglion that arise from the anterior border of the ganglion, from medial to lateral aspects. The ophthalmic nerve appears first (V1); the maxillary nerve emerges second (V2); and, finally, the mandibular nerve (V3) emerges. The origins of these nerves in the ganglion are somatotopically located in the ganglion; the ophthalmic branch is located most medioposteriorly, the maxillary branch is central, and the mandibular branch occupies a ventrolateral position. ⁽¹⁾

Trigeminal neuralgia (TN) is the most severe pain in the world, expressed by Peter J. Jannetta, MD with the term "*striking back*", a layman's experience for patients with facial pain. TN or *Tic Doloureux* is a painful condition of the face. This pain has been known since ancient times, where there is a description of facial pain by Ibn Sina (980–1073) in Arabic literature. An example of an early medical intervention was by Locke in 1677, who applied sulfuric acid to the Duchess of Northumberland's face in an attempt to treat her trigeminal neuralgia. ⁽¹⁻³⁾

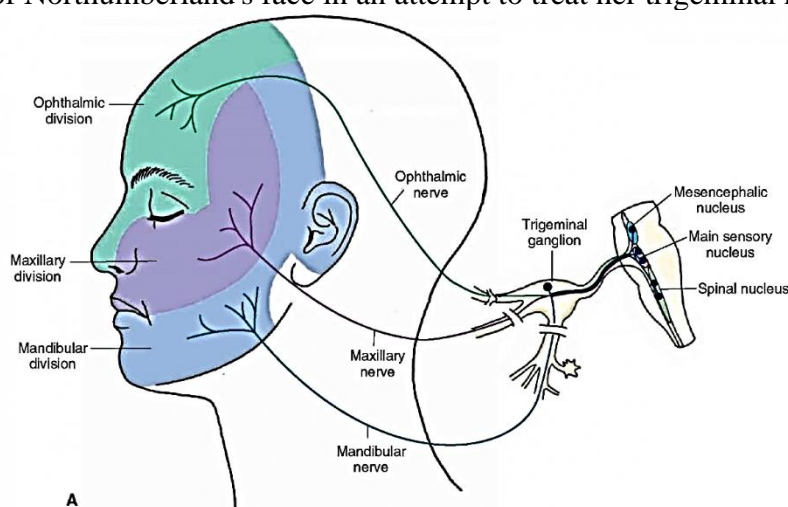


Figure 3.1. The three main branches of the trigeminal ganglion

A survey conducted in 6 European countries showed that trigeminal neuralgia significantly impacts the quality of life and socioeconomic functioning of affected patients. Trigeminal neuralgia is the most common form of facial pain in people over 50 years of age. Various epidemiological studies have shown the annual incidence to be approximately 4-5 new patients per 100,000. The highest incidence occurs between ages 50 and 70 years; in 90% of cases, symptoms begin after age 40. TN occurs more often in women than men with a ratio of 1.5:1 ^(1,2)

The pathophysiology of TN is unclear. Based on clinical observations, compression of the trigeminal nerve near the origin of the brain stem, which is called the root entry zone, by blood vessels or tumors, can cause Trigeminal Neuralgia. Local pressure causes demyelination which leads to abnormal depolarization resulting in ectopic impulses. ^(1,2)

TN's complaint is specific, marked with exists pain all around face. Formerly before found technology radiofrequency ablation as an alternative, possible therapy carried out by force medical For relieve pain is with drugs and surgery. However Because drugs proven No capable in a way effective relieve the pain experienced patient, then therapy radiofrequency ablation moment This is Minimally invasive techniques are common used in TN patients without must do take care stay at home Sick (*one day care*). ⁽¹⁻³⁾

Experts In the world of pain, it is believed that most cases of trigeminal neuralgia occur in the branches trigeminal nerves V2 and V3 (32%). Surgery microvasculature in a number of study proven can increase quality life patient Because capable overcome pain previously suffered in long term. However thereby technique percutaneous like radiofrequency is also proven give satisfactory result with level success therapy reached 90%, however with level

recurrence is also more tall compared technique surgery micro. In TN patients with age continue, then radiofrequency ablation is choice therapy best compared to surgery micro related sufficient morbidity and mortality tall moment must done therapy use technique surgery micro.

Based on the American Academy of Neurology in 2016, there are three category TN diagnostics, namely : ⁽³⁾

1. TN classic: Where need sign real exists change Morphology of the root of the trigeminal nerve compression vessels blood.
2. secondary TN: caused by disease neurological can identified
3. Idiopathic TN: own no etiology is known.

The diagnosis of TN is usually based on the characteristic clinical picture. The main characteristic is sudden and severe sharp pain, usually unilateral, which is triggered by a light touch to the facial zone. This pain occurs in paroxysms, in the distribution of the trigeminal nerve; usually involves the distribution of the maxillary nerve (V2) or mandibular nerve (V3). TN pain symptoms can be categorized as; Dysaesthesia (abnormal perception of pain), Allodynia (due to stimuli that do not normally trigger pain), Hyperalgesia (increased sensitivity to pain) ⁽¹⁾

For Establishing a diagnosis of TN depends on the explanation patient on attack pathognomonic pain , where signs and symptoms of TN are : ⁽³⁾

1. Attack short, strong, sharp, pain in 1 (one) or more branch nerve cranial fifth. Pain _ must be very sharp, stinging, felt painful like sting electricity.
2. There is a cause like stimulation general by food, washing, shaving, weather cold, warm and dry.
3. There is evidence possible compression of the trigeminal nerve checked with inspection support like MRI (for differentiate tumors, sclerosis multiple, compression neurovascular). MRI is choice For diagnose compression of the trigeminal nerve. 3D construction helps avoid exploration of the posterior fossa that does not required in case tumor benign or M.S.

In enforcing diagnosis this , generally given 6 (six) questions to the patient , namely is they experienced : ^(2,3)

1. Pain when attack
2. Attack generally short (seconds /minutes)
3. Attack arise occasionally and very briefly
4. Attack is unilateral
5. Attacks in the trigeminal nerve area
6. Symptom unilateral autonomy

TN felt by patients varies greatly, according to the area of the distribution zone of the trigeminal nerve such as the ophthalmic (V1), maxillary (V2), and mandibular (V3) branches, where the mandibular branch is most often involved followed by the maxillary branch, while the ophthalmic branch is the least involved. A combination of branches involved from V1, V2 and V3 can occur and can be seen in table.1 ⁽²⁻⁴⁾

Table 1. Distribution of pain in various nerve branches in trigeminal neuralgia.

only V1	4%
V2 only	17%
V3 only	15%
V2 + V3	32%
V1 + V2	14%
V1 + V2 + V3	17%

TN management carried out by medical personnel can in a way pharmacology and surgery. Because of drugs proven No capable in a way effective relieve the pain experienced

TN patients and with the more development minimally invasive techniques especially since found technology radiofrequency ablation , then treatment TN patients can done with radiofrequency ablation without must do take care stay at home Sick (*one day care*).^(1,2,4)

The choice of treatment for TN can be made in the initial condition, it can be done with conservative treatment, which will be done by selecting pharmacological treatment based on a systematic review of relatively older study data or the latest Cochrane database. TN's drug of choice is carbamazepine. From observational studies, it appears that carbamazepine can reduce pain symptoms in approximately 70% of cases. Oxcarbazepine has demonstrated similar efficacy. Other drugs that may be used, although there is no clinical evidence of their efficacy, are gabapentin, pregabalin, and baclofen. Rozen summarizes recommendations for medical treatment of trigeminal neuralgia in Table 2 .^(1,2)

Table 2. Medical treatments for trigeminal neuralgia .

Drug	Dose	Time is lost painful
Carbamazepine	400 – 800 mg/ day	24 – 48 hours
Phenytoin	300 – 500 mg/ day	24 – 48 hours
Baclofen	40 – 80 mg/ day	?
Clonazepam	1.5 – 8 mg/ day	?
Valproate	500 – 1500 mg/ day	Sunday
Lamotrigine	150 – 400 mg	24 hours
Pimozide	4 – 12 mg	?
Gabapentin	900 – 2400 mg/ day	1 week
Oxcarbazepine	900 – 1800 mg/ day	24 – 72 hours

Interventional treatment is performed if medical treatment is unsuccessful or has too many side effects. In this case, there are currently 6 clinically appropriate possibilities:⁽¹⁻³⁾

1. Surgical microvascular decompression (MVD).
2. Stereotactic radiation therapy, Gamma knife.
3. Percutaneous balloon microcompression.
4. Percutaneous glycerol rhizolysis.
5. Percutaneous radiofrequency (RF) treatment such as Gasserian ganglion.
6. Gasserian ganglion stimulation/neuromodulation (experimental).

Sphenopalatine Ganglion Anatomy

The sphenopalatine ganglion (SPG) or also known as Meckel's Ganglion is located in the pterygopalatine fossa (PPF) near the sphenopalatine foramen. The position of this ganglion is also behind the medial concha of the nose. SPG is the largest parasympathetic ganglia and is one of four parasympathetic ganglia in the head and neck area. This structure is shaped like an inverted pyramid measuring 2 cm x 1 cm.^(2,6,7)

The Pterygopalatine Fossa (PPF) is formed by three bony structures: the palatine, maxilla, and sphenoid bones. The boundaries of the pterygopalatine fossa are the posterior surface of the maxilla anteriorly, the lateral surface of the palatine bone medially, and the anterosuperior surface of the pterygoid process posteriorly and at the roof. Several structures enter and exit the pterygopalatine fossa through several foramina and fissures. The maxillary nerve enters the pterygopalatine fossa through the foramen rotundum. It passes anteriorly and exits as the infraorbital nerve through the inferior orbital fissure. The sphenopalatine ganglion innervates the lacrimal glands, paranasal sinuses, mucous glands of the nasal cavity and pharynx, gums, and mucous membranes and glands of the hard palate. The SPG also communicates anteriorly with the nasopalatine nerve .^(3,8-12)

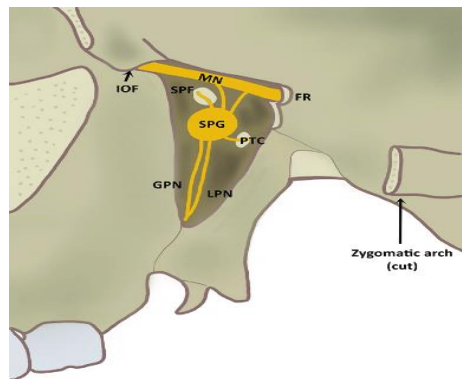


Figure 3.2. Schematic illustration of pterygopalatine fossa.

Abbreviations : FR, foramen rotundum; GPN, greater palatine nerve; IOF, inferior orbital fissure; LPN, lesser palatine nerve; MN, maxillary nerve; PTC, pterygoid canal; SPF, sphenopalatine foramen; SPG, sphenopalatine ganglion. ⁽¹²⁾

As a nerve center, the SPG has sensory, motor and autonomic components. Sensory nerve fibers originate from the maxillary nerve, through the SPG and then distributed to the nasal membrane, soft palate and part of the pharynx. Some parts of the motor nerve fibers run with the sensory nerve fibers. ^(2,6,13)

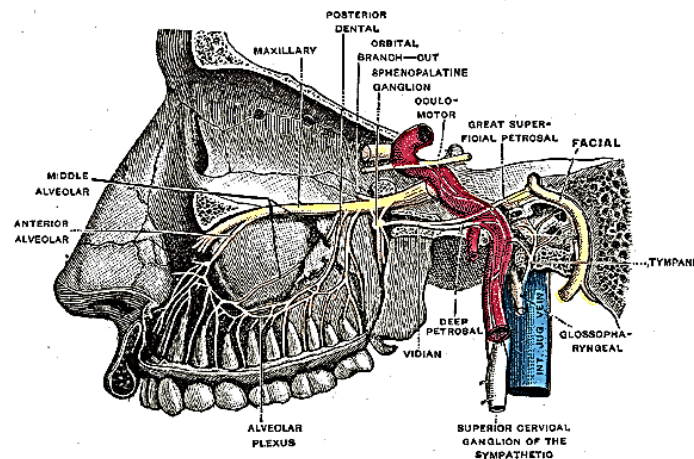


Figure 3.3. The sphenopalatine ganglion and its branches

SPG autonomic innervation has a more complex structure. The sympathetic component originates from preganglionic sympathetic nerve fibers originating from the upper thoracic spinal cord, forming *the white rami communicantes*, and travels through the sympathetic ganglion where the preganglionic fibers synapse with the postganglionic fibers. These postganglionic nerve fibers then join the carotid nerve and then branch and innervate the petrosal and vidian nerves. The postganglionic sympathetic nerve then exits the SPG to the lacrimal gland and the nasal and palatal mucosa. ⁽⁶⁾

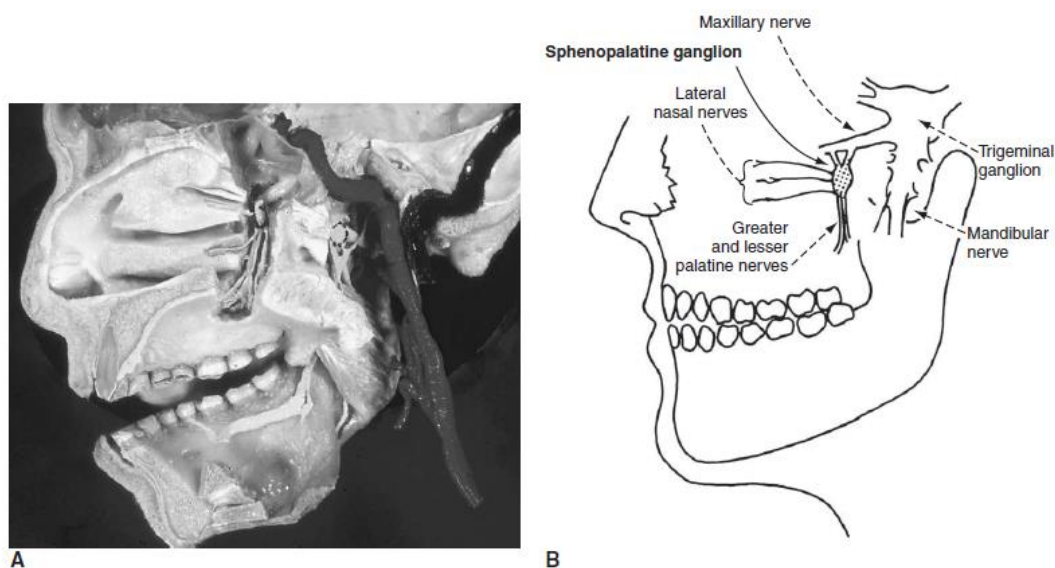


Figure 3.4 (A) Sphenopalatine ganglion and its branches to the nasal area and palate in cadaveric dissection. (B) Anatomy of the sphenopalatine ganglion and its intimate relationship to the surrounding nervous system.

The parasympathetic innervation of the SPG comes from the nervus intermedius (part of the facial nerve) via the greater petrosal nerve. In the sphenopalatine ganglion, the ganglion of parasympathetic nerve fibers from branches of the greater petrosal nerve synapses with postganglionic axons as well as vasodilator and secretory fibers originating from branches of the trigeminal nerve, then innervates the mucous membranes of the nose, soft palate, tonsils, uvula, palate, lips and upper gums. , and the upper part of the pharynx. Because it has a connection with the maxillary nerve, the sphenopalatine ganglion also has parasympathetic fibers which are glands innervated by branches of the maxillary nerve, namely the lacrimal glands, nasal glands, palate glands and pharyngeal glands. ^(6,14,15)

A. Sphenopalatine Ganglion Block

The sphenopalatine ganglion block was recorded to have been used since 1908 by Sluder in cases of neuralgia. Over a period of more than a century, this procedure has been performed to treat many pain complaints ranging from head and facial pain to sciatica and dysmenorrhoea. Various literature has discussed both the effectiveness and the pros and cons for interventional pain therapists in using this procedure. ^(6,14,16)

B. Indication

Currently, sphenopalatine ganglion blocks are used to reduce facial pain and headaches. Some of the indications for sphenopalatine ganglion block that have been proven in various studies are sphenopalatine neuralgia, idiopathic trigeminal neuralgia in combination with Gasserian ganglion block, postherpetic neuralgia. Atypical facial neuralgia, *cluster headache* , migraine. ^(6,13–17)

There are several other indications for sphenopalatine ganglion block, especially looking at the anatomy of the wide distribution of the nerve. The C2, C3, and C4 nerve roots connect to *the superior cervical ganglion* via *the deep peroneal nerve* and then enter the sphenopalatine ganglion. This is the basis that sphenopalatine ganglion blocks can relieve head, face, neck and upper back pain which is innervated by *the upper cervical spine* . Several studies also state that in certain patients, sphenopalatine ganglion blocks can help relieve malignant pain in the head and neck area. ^(6.17)

C. Contraindications

There are several contraindications for sphenopalatine ganglion block, such as: *Immunocompromised*, systemic or local infection, coagulopathy or thrombocytopenia, difficult anatomy or anatomical abnormalities, and the patient refuses. ^(2,6)

DISCUSSION

In the anamnesis, 56 yo female patient came with complaints of pain on the right side of the face, specifically in the lower jaw, upper jaw, temples and even the eyes, which the patient had experienced this incident 2 years ago. The pain felt really interferes with the patient's activities, and the pain gets worse even though the patient has taken medication. In many literatures it is said that TN incidents often occur in women compared to men, and occur at ages over 50 years.

The pain that patients feel over time is very disturbing and increasingly severe, this is in accordance with what is said in several literatures that TN is the most severe pain complaint in the world, this was expressed by Peter J. Jannetta, MD with the term " *striking back* ", a layman's experience for a patient with facial pain. Trigeminal Neuralgia (TN) or *Tic Doloureux* is a painful condition of the face and significantly impacts the quality of life and socio-economic functioning of affected patients. ^(2,3)

The diagnosis of TN is based on the characteristic clinical picture. The main characteristic is sudden and severe sharp pain, usually unilateral, which is triggered by a light touch to the facial zone. This pain occurs in paroxysms, in the distribution of the trigeminal nerve; usually involves the distribution of the maxillary nerve (V2) or mandibular nerve (V3). Symptoms of TN can be categorized as follows: Dysaesthesia (abnormal perception of pain) Allodynia (due to stimuli that usually do not trigger pain), in this patient Dysaesthesia and allodynia occurred. ⁽¹⁾

The initial complaint occurred, the patient went to the doctor and was given pharmacological therapy, the patient even underwent acupuncture, but the pain that occurred did not change. This is in accordance with several literatures which say that the choice of treatment for TN can be done in the initial condition, it can be done with conservative treatment, which will be done by selecting pharmacological treatment based on a systematic review of relatively older study data or the latest Cochrane database. TN's drug of choice is carbamazepine. ^(3,4,17-19)

Because pharmacological treatment did not produce improvement in pain, the patient was referred to a medical interventional doctor, then a Gasserian ganglio block injection was performed. After these actions the complaints have reduced considerably. In some literature, it is said that the cause of TN is difficult to determine, but it is said that the most likely thing is the presence of continuous pressure on the trigeminal nerve. And there are several recommended treatments, namely pharmacological and surgical, as well as nerve blocks. Nerve blocks are still the treatment of choice to reduce TN symptoms. If only sympathetic nerve blocks are performed, this goal can be achieved by strongly blocking sympathetic stimulation, by performing sympathetic blocks in several places. If left untreated, sympathetic nerve hyperactivity can cause ischemia due to decreased intraneural bed capillary blood pressure. If ischemia persists persistently, endoneural edema forms, increasing endoneural pressure and further reducing endoneural blood flow, resulting in irreversible nerve damage. This damage can cause damage to large myelinated nerve fibers, which are more metabolically active. The combination of sphenopalatine ganglion block and RF in these patients resulting in good pain management capabilities may be considered. ^(3,4,19,20)

Radio Frequency Thermocoagulation has been proven safe and effective in treating a variety of chronic pain disorders. It has been widely used in the treatment of refractory TN in the last decades because early pain relief can be achieved in 98% of patients. ⁽²⁰⁾

The wide distribution of this nerve in the head and face area is illustrated by the many indications for sphenopalatine ganglion block treatment. Cluster headaches and migraines, trigeminal neuralgia, and herpes zoster ophthalmicus are some of the common indications for sphenopalatine ganglion block procedures. Apart from that, this procedure is also performed to treat pain in cases of head and facial tumors. ^(15,21)

CONCLUSION AND RECOMMENDATION

Trigeminal neuralgia, is chronic pain in the face that is very difficult to treat. Chronic atypical facial pain is established primarily through the process of eliminating other causes, therefore multidisciplinary examination and consultation are often necessary.

In TN, when pharmacological therapy does not produce the desired or maximum treatment, then injection treatment and RF intervention in the giserian ganglion and pterygopalatinum (sphenopalatinum) ganglion before surgery can be considered.

Thorough understanding of PPG anatomy and related structures allows doctors to more accurately predict correct needle placement .

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