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Radiofrequency Ablation for Trigeminal Neuralgia Patient: A Case Report

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ABSTRACT

Introduction: Radiofrequency ablation is the most commonly used percutaneous procedure to treat trigeminal neuralgia. This therapy is less invasive, safe, and provides immediate results and minimal side effects. This study aims to demonstrate the potential of radiofrequency ablation in the management of trigeminal neuralgia pain. **Case presentation:** A 64-year-old man with recurrent trigeminal neuralgia was treated with radiofrequency ablation at Hasanuddin University Hospital. The patient had previously received radiofrequency ablation at the same site as now, and the patient was pain-free for up to three years. After the procedure, complaints of pain gradually subsided for two months until the patient felt pain-free. **Conclusion**: Radiofrequency ablation is a minimally invasive alternative treatment for chronic pain that is not controlled by pharmacotherapy, such as trigeminal neuralgia. Good knowledge of anatomy and imaging techniques is required for successful therapy. In this patient, the radiofrequency ablation procedure was quite successful, characterized by complaints of pain which gradually subsided in two months until the patient felt pain-free.

Keywords: trigeminal neuralgia, radiofrequency, ablation, percutaneous procedure

Introduction

Trigeminal neuralgia (TN) or tic douloureux is a syndrome of facial pain that can occur repeatedly and is chronic in which the pain is generally unilateral following the sensory distribution of cranial nerve V (trigeminal nerve) and is often followed by facial spasms or tic phenomena (repetitive spasmodic contractions of muscles) in the face.[1] The prevalence of trigeminal neuralgia cases is 4 per 100,000 population, with the number of female : male sufferers being 1.74:1. 90% of cases of trigeminal neuralgia occur in people over 50 years of age, with a peak incidence at 60-70 years of age.[2] Trigeminal neuralgia was more common on the right side of the face than on the left side (ratio 1.5:1), which was probably due to the narrower diameter of the right foramen rotundum and the right foramen ovale compared to the left foramen rotundum and foramen ovale.[3] Chronic pain management generally begins with conservative therapy, such as pharmacological therapy and physiotherapy. If conservative therapy cannot achieve the desired degree of pain reduction, then another modality is needed in the form of pain intervention. This procedure is not only a curative therapy but can also be used as a diagnostic measure.[4] This study aimed to demonstrate the potential of radiofrequency ablation in the management of trigeminal neuralgia pain.

Case Presentation

A 64-year-old man came to the pain and intervention clinic of Universitas Hasanuddin Hospital with the chief complaint of right facial pain a week ago. The pain felt like a short electric shock with a VAS score of 8-10 points and resolved without intervention. The pain was in the right zygomatic zone and radiated to the upper alveolar region and jaw. The triggers for pain include eating and exposure to wind. Sometimes the pain recurs several times a day.

The patient has a history of suffering a stroke on the right side of the body in 2015. The patient also has a history of the same complaint in 2017 and was diagnosed with TN. Then the patient was given a radiofrequency ablation intervention by an anesthesiologist in January 2017. After the intervention, the patient felt pain-free for up to three years.

Physical examination on admission reported vital signs within normal limits. On further examination, a trigger point was found on the right side of the zygomaticus zone and radiated to the right upper lip. However, the muscles involved in mastication and mouth movements are normal, and their function is not limited. Laboratory tests and CT scan imaging were normal. Initially, the patient started physiotherapy concurrently with oral carbamazepine (100 mg, three times daily), fluoxetine 10 mg twice daily, and artificial tears four times daily but still

complained of right facial pain. Then the patient is planned for a second radiofrequency ablation at Universitas Hasanuddin Hospital in February 2020 at the same place as the first ablation.

Prior to the procedure, the CT scan examination room was disinfected, and the patient was placed in a supine position with the head extended. Vital signs (electrocardiogram, blood pressure monitoring, and pulse oximetry) are monitored throughout the entire procedure. In the patient's right arm, a 20 gauge intravenous catheter was placed, then given intravenous analgesia and sedation in the form of Midazolam 1-2 mg and Fentanyl 25-50 mcg to increase patient comfort and reduce anxiety. The foramen ovale and gastric ganglion were identified with the Guiding C Arm in the oblique submental position (Figure 1). Asepsis and antisepsis were performed on the affected side of the face, about 2 cm lateral to the labial commissure (corner of the mouth) (Figure 2). The skin and subcutis were anesthetized using 40 mg of Lidocaine 2%. The 22-gauge 10 cm radiofrequency cannula needle was advanced coaxially (tunnel view) onto the X-ray beam towards the foramen ovale under fluoroscopic guidance in the lateral view (Figures 3 and 4). A finger can be inserted into the oral cavity to ensure that the buccal mucosa is not perforated. The needle was then in the foramen ovale (Figure 5). The stylet is then removed from the cannula, and aspiration is performed to ensure that there is no cerebrospinal fluid (CSF) or blood. A stimulation test is mandatory before radiofrequency lesions by administering 0.3 volts, which is characterized by muscle contraction under the jaw. Radiofrequency was carried out using a radiofrequency generator at temperatures of 60, 65, and 70 degrees Celsius for 60 seconds each. After the procedure, a dressing is applied to the patient. After the intervention, the patient then came to the control for 2 months, the patient felt no pain, and no side effects were reported.

Figure 1. Visualized the foramen ovale with the guiding C-arm in the oblique submental position.

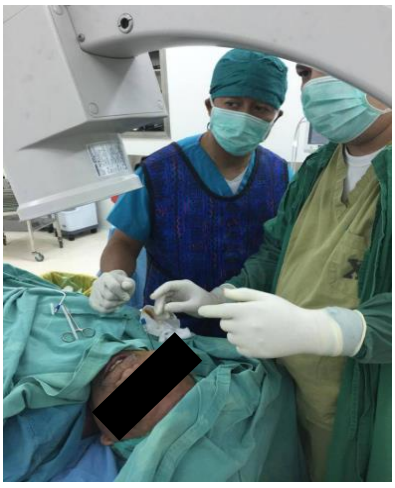

Figure 2. Insertion of the radiofrequency cannula needle 2 cm lateral to the labial commissure.

Figure 3. C-arm lateral position.

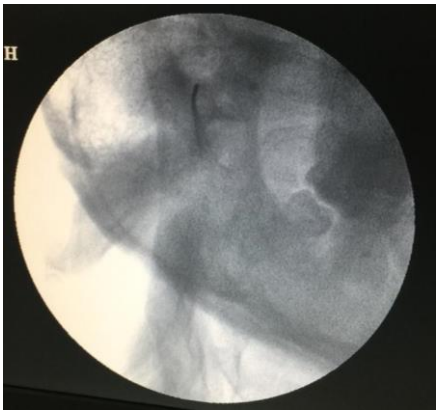

Figure 4. Fluoroscopic view showing needle at the entrance of the foramen ovale.

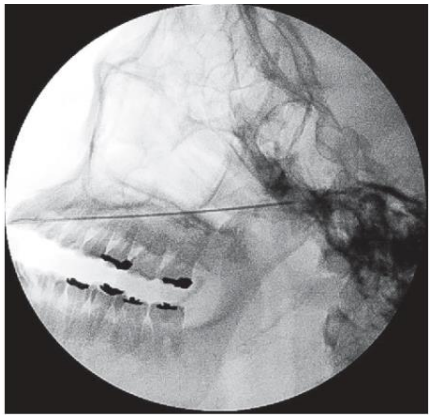

Figure 5. The needle was then in the foramen ovale

Discussion

The patient came to the pain clinic at Universitas Hasanuddin Hospital with recurrent right facial pain with a diagnosis of trigeminal neuralgia. Previously, radiofrequency ablation had been performed about 3 years ago by anesthesiologists at Universitas Hasanuddin Hospital. The most likely cause of this patient's basis is a vascular disorder where the patient has a history of a previous stroke, so it can be classified as symptomatic trigeminal neuralgia. This meets the diagnostic criteria for trigeminal neuralgia, where the patient complains of unilateral facial pain (right side) with sharp pain like an electric shock triggered by activities such as chewing, even when blown by the wind.[5-7] Pain is brief and recurs several times a day. Ideally, to diagnose trigeminal neuralgia, investigations are needed to determine the etiology and rule out other possible causes.[8]

Radiofrequency ablation was carried out for the second time at Universitas Hasanuddin Hospital in February 2020. The first radiofrequency ablation was carried out at the same place in January 2017. Based on the literature, this procedure can provide pain relief for 98% of patients suffering from trigeminal neuralgia. However, as many as 15%-20% of patients experience pain recurrence within 12 months after the intervention. The ablation procedure can be repeated on the same patient if the pain recurs. The first procedure can be said to be successful when the patient feels pain-free for up to three years. This is in accordance with the literature, which states that on radiofrequency, there can be a postoperative pain-free period of up to 3-4 years. Likewise, in the second act, where the results of the follow-up in this patient were quite satisfied with the treatment performed.[9] This is characterized by reduced complaints of pain in the face, which gradually decreases over 1 month until you feel pain-free in accordance with the literature, which says that after radiofrequency, the formation of lesions is

followed by the formation of scars in the lesion tissue first, coagulation occurs, followed by an acute inflammatory reaction, necrosis, and collagen deposition. The process takes about 3 to 4 weeks.

Among various pain therapies with interventional methods, radiofrequency ablation is the best method for relieving pain in trigeminal neuralgia. A study of 500 NTG patients undergoing radiofrequency therapy and other surgical treatments showed that radiofrequency had the highest rate of postoperative pain relief and the lowest recurrence rate when compared to other interventional therapies.[10]

Conclusion

Radiofrequency ablation is a minimally invasive alternative treatment for chronic pain that is not controlled by pharmacotherapy, such as trigeminal neuralgia. Good knowledge of anatomy and imaging techniques is required for successful therapy. In this patient, the radiofrequency ablation procedure was quite successful, characterized by complaints of pain which gradually subsided in two months until the patient felt pain-free.

References

1. Srivastava, Rahul, Bhuvan J, Ashutosh S, Pankaj P. Diagnostic criteria and management of trigeminal neuralgia: a review. Asian Pac J Health Sci. 2015; 2(1): 108-18.
2. Childs A, Meaney J, Ferrie C. Neurovascular compression of the trigeminal and glossopharyngeal nerve: three case reports. Arch Dis Child. 2000; 82: 311-5.
3. Emril, Dessy R. Kok-YH. Treatment of trigeminal neuralgia: role of radiofrequency ablation. Journal of Pain Research. 2010; 3: 249–54.
4. Huang Q, Xiao ML, Jin SC, CunJu B, Dong YL, et al. The effectiveness and safety of thermocoagulation radiofrequency treatment of the ophthalmic division (V1) and/or maxillary (V2) and mandibular (V3) division in idiopathic trigeminal neuralgia: an observational study. Pain Physicians. 2016; 19(7): E1041–7.
5. Doshi PP, Parikh NH. Radio-Frequency ablation of trigeminal ganglion for refractory pain of bilateral trigeminal neuralgia in a patient with multiple sclerosis. Indian J Pain. 2018; 32: 113-5.
6. Yang XH, Li Y, Yang LQ, Bai SW, Jia XN. Nerve coblation for treatment of trigeminal neuralgia: a case report. World J Clin Cases. 2019; 7(9): 1060-5.

7. Hong T, Ding Y, Yao P. Long-Term Efficacy and complications of radiofrequency thermocoagulation at different temperatures for the treatment of trigeminal neuralgia. Biochem Res Int. 2020; 2020: 3854284.
8. Akbas, Mert, Haitham HS, Tamer HE, Bora D, et al. Radiofrequency thermocoagulation in cases of atypical trigeminal neuralgia: a retrospective study. The Egyptian Journal of Neurology, Psychiatry, and Neurosurgery. 2019; 55: 46.
9. Gouvinhas C, Veiga D, Mendonca L, Sampaio R, Azevedo LP, et al. Interventional pain management in multidisciplinary chronic pain clinics: a prospective multicenter cohort study with one-year follow-up. Pain Res Treat. 2017; 2017: 8402413.
10. Taha JM, Tew JM Jr. Treatment of trigeminal neuralgia by percutaneous radiofrequency rhizotomy. Neurosurg Clin N Am. 1997; 8(1): 31-9.