Case Report

Severe resistant trigeminal neuralgia managed successfully by computed tomography-guided gasserian ganglion block

ABSTRACT

The present case report discussed the management of a 62-year-old female patient with medically refractory trigeminal neuralgia (TN) with percutaneous computed tomography-guided gasserian ganglion block (CT-GGB). Using Hartel anterior approach, we successfully performed CT-GGB with precise positioning of the 22G LP needle tip in the medial aspect of the foramen ovale at the base of the skull as was witnessed clinically by the patient as sharp pain along the affected areas of the face, confirmed by serial CT screening until it reaches the predefined depth. Later, neurolysis mixture was injected, and the needle was finally flushed with 0.5 ml of normal saline and then withdrawn. Sterile dressing was applied at the skin entry site after removing the LP needle. Postprocedural check, CT was performed to look for any immediate complications. Patients were observed for regular follow-up at 1 week, 2 weeks, 1 month, 3 months, and every 3 months after that. The patient was relieved entirely of facial pain on the CT table (Numerical Rating Scale Pain Score-0) with minimal facial numbness and no sensation loss. To conclude, CT-GGB invention is an effective and safe technique for medically refractory TN.

Keywords: Computed tomography, gasserian ganglion block, neurolysis mixture, trigeminal neuralgia

INTRODUCTION

Trigeminal neuralgia (TN) is a painful condition that causes shooting or jabbing sensations similar to an electric shock on one side of the face and is more likely to occur in people older than 50 years, affecting women more often than men. The symptoms may be short-lived mild attacks but can progress to more frequent chronic bouts of searing pain involving the trigeminal nerve, which carries sensation from face to brain. Although the condition is not life-threatening, the intensity of the pain can be debilitating. Treatment options range from medications to surgical (microvascular decompression) management. Percutaneous rhizotomy procedures (balloon compression, glycerol injection, and radiofrequency thermal lesioning) are on the rise; however, they are performed using fluroguidance with little literature on computed tomography (CT) use as a tool of interest.

Access this article online	
Website: https://journals.lww.com/mjm	Quick Response Code
DOI: 10.4103/MJM.MJM_8_23	

CASE REPORT

A 62-year-old female came to the interventional radiology department with a history of chronic toothache which had undergone root canal management, complaining of

Devara Anil Kashi Vishnuvardhan, Sandeep Botcha, Venkata Suman, Paka Lavanya, K. Rama Murthy

Department of Radiology and Interventional Radiology, Medicover Hospitals, Visakhapatnam, Andhra Pradesh, India

Address for correspondence: Dr. Devara Anil Kashi Vishnuvardhan,
Department of Radiology and Interventional Radiology, Medicover Hospitals, Visakhapatnam, Andhra Pradesh, India.
E-mail: anilkashi@yahoo.com

Submitted: 14-Dec-2023 **Revised:** 01-Jan-2024
Accepted: 04-Jan-2024 **Published:** 14-Feb-2024

How to cite this article: Vishnuvardhan DA, Botcha S, Suman V, Lavanya P, Murthy KR. Severe resistant trigeminal neuralgia managed successfully by computed tomography-guided gasserian ganglion block. Medicover J Med 2024;1:41-3.

right-sided severe facial pain diagnosed as TN and was on medical management. At present, she suffers from severe pain in the right half of her face with mild swelling, which worsens while brushing, eating, chewing, and swallowing. She has been unable to sleep for the last 3 days owing to severe sharp pain. She is a known diabetic, hypertensive, hypothyroid, seizure disorder, multi-infarct state and was admitted to the hospital with altered sensorium twice in a span of the last 3 months, during which she was found to have hypoglycemic encephalopathy, septic shock on first admission, and hypomagnesemia on second admission for which she was treated conservatively and recovered completely. Her magnetic resonance imaging (MRI) brain plain revealed multiple chronic lacunar infarcts in bilateral thalami, left caudate nucleus, both halves of the midbrain, and right cerebellum with mild-to-moderate periventricular and subcortical ischemic changes in bilateral frontal and parietal regions. Three-dimensional fast imaging employing steady state acquisition (FIESTA) MRI did not reveal any significant abnormality [Figure 1]. The treating team converged on a diagnosis of TN resistant to conservative medical management and offered her options of surgical management and percutaneous CT-guided gasserian ganglion block (GGB). After understanding its risks and benefits, the patient and their relatives opted for a CT-guided procedure. Basic preprocedural blood investigations were done, periprocedure antibiotics started, and Numerical Rating Scale Pain Score (NRSP) was recorded. The patient was placed in a supine position with headfirst (toward the gantry) on the CT table with neck extended and head tilt of 15°–30° contralateral to the affected side of the face. Sterile draping and local anesthetic infiltration at the skin entry site were done. Using Hartel anterior approach, we successfully performed CT-guided percutaneous-GGB with precise positioning of 22G lumbar puncture (LP) needle tip in the medial aspect of the foramen ovale at the base of the skull as was witnessed by a patient as sharp pain along the affected areas of the face, confirmed by serial CT screening until it reaches the predefined depth. Following this neurolysis, mixture consisting of 1 ml (40 mg) triamcinolone, 2 ml of 2% xylocaine, 3 ml of 0.5% bupivacaine, and 0.5 ml contrast were injected [Figures 2-4]. The needle was finally flushed with 0.5 ml of normal saline and then withdrawn. Sterile dressing was applied at the skin entry site after removing the LP needle. Postprocedure check CT was performed to look for any immediate complications. The patient was observed for 2 h and then sent home with advice to monitor blood sugars, stop oral analgesic medications, and regular follow-up at 1 week, 2 weeks, 1 month, 3 months, and every 3 months after that.

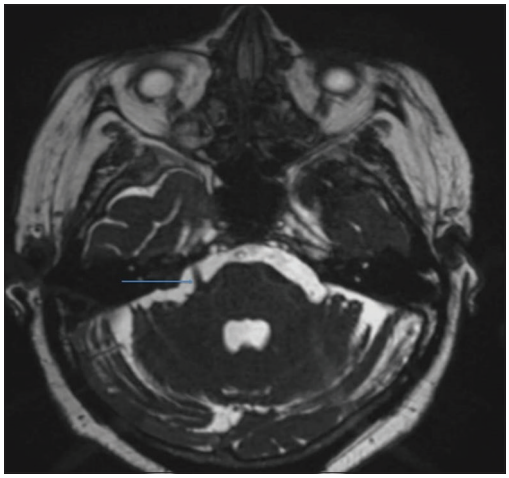

Figure 1: Magnetic resonance imaging brain three-dimensional FIESTA showing right trigeminal nerve (blue arrow)

RESULTS

The patient was relieved entirely of facial pain on the CT table (NRSP-0) with minimal facial numbness and no sensation loss. There were no immediate procedure-related complications; swelling of the cheek increased at 1-month follow-up (NRSP-2) with a gradual reduction at 3-month follow-up (NRSP-0). Her overall quality of life has improved, and she can do her day-to-day activities efficiently even at 1-year follow-up posttreatment.

DISCUSSION

"TN is defined by paroxysmal, sudden, unilateral, brief, electric shock-like, and recurrent pain in the facial region innervated by the trigeminal nerve." Refractory TN can lower a patient's quality of life and cause depression.[1] Antiepileptic medications are used as the first line of treatment for TN, although they are unsuccessful in some patients, and some patients cannot tolerate their adverse effects. Despite the availability of other surgical procedures, a nerve block is a quick and secure percutaneous therapy for TN patients. In the present case report, we reported a case complaining of right-sided severe

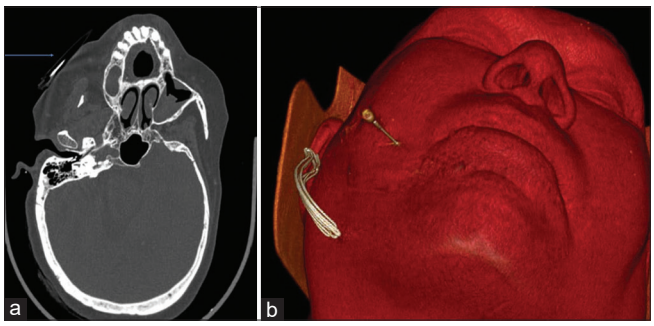

Figure 2: Computed tomography axial view (a) and three-dimensional volume-rendered reformat (b) showing dense radio marker (blue arrow); lateral head tilt positioning along with the site of needle entry

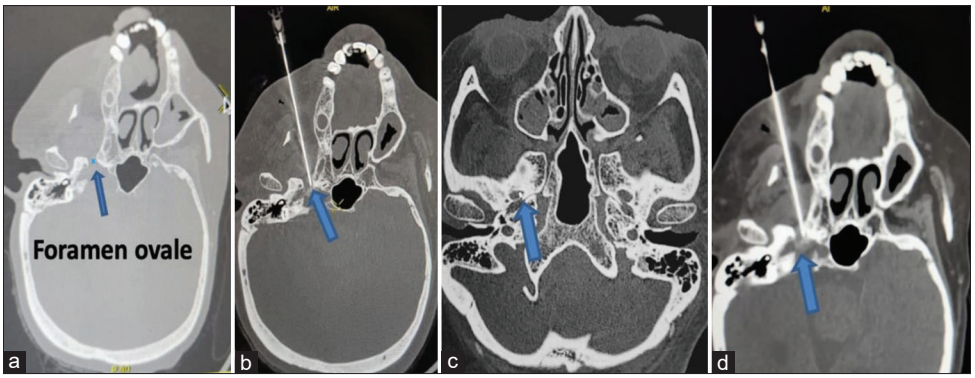

Figure 3: Computed tomography brain sections with blue arrows showing (a) foramen ovale, intra-procedure: needle tip (b and c) in the medical aspect of foramen ovale with drug percolation (d)

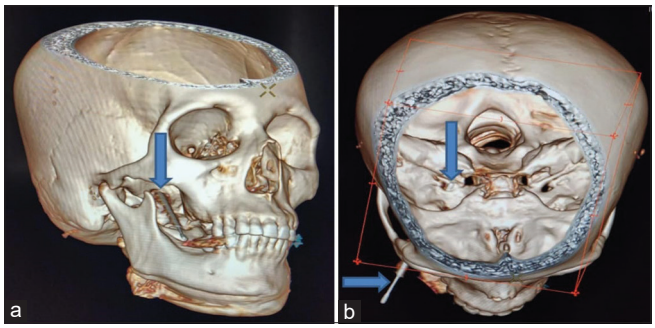

Figure 4: Three-dimensional volume-rendered images (a and b) of the skull showing the needle entry point and its tip within foramen ovale (blue arrows)

facial pain diagnosed as TN and subjected to a CT-guided percutaneous-GGB procedure. She was completely relieved of facial pain on the CT table (NRSP-0) with minimal facial numbness and no sensation loss. There were no immediate procedure-related complications; swelling of the cheek increased at 1-month follow-up (NRSP-2) with a gradual reduction at 3-month follow-up (NRSP-0). Her overall quality of life has improved, and she can do her day-to-day activities efficiently even at 1-year posttreatment. According to the authors literature review, only two studies were pertinent to the current investigation. In a prospective study by Lan *et al.*,[2] involving 28 patients with idiopathic TN who underwent CT-guided percutaneous pulsed radiofrequency treatment of the gasserian ganglion, the researchers discovered that the postoperative Numerical Rating Scale (NRS) score steadily reduced from 7.6 preoperative to 0.1 postoperative. Recently, Sun *et al.*[3] conducted a multicentric retrospective analysis on patients who had received a gasserian ganglion block with CT guidance and suffered from acute or subacute zoster-related TN. According to their research, all patients postoperative NRS scores considerably dropped. At various time points, the acute zoster group's NRS scores were lower than those of the subacute zoster group. The current case uses a local anesthetic and steroid combination as neurolysis mixture for refractory TN. Medically unresponsive TN can be treated safely and effectively with CT-guided innovation.

CONCLUSION

In clinical scenarios with comorbidities, as discussed above, minimally invasive percutaneous interventional procedures such as CT-guided GGB can relieve severe facial pain with a low risk of complications. CT guidance during the procedure ensures better accuracy, safety, and favorable response in pain relief. However, future studies must be investigated to determine the ultimate effective and safer choice.

Acknowledgments

The authors would like to thank the management of Medicover Hospital, Visakhapatnam.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Zakrzewska JM, Linskey ME. Trigeminal neuralgia. BMJ 2014;348:g474.
2. Lan M, Zipu J, Ying S, Hao R, Fang L. Efficacy and safety of CT-guided percutaneous pulsed radiofrequency treatment of the Gasserian ganglion in patients with medically intractable idiopathic trigeminal neuralgia. J Pain Res 2018;11:2877-85.
3. Sun Z, Liu L, Liu H, Luo F. Effect of CT-guided gasserian ganglion block with local anesthetics and steroids on acute/subacute zoster-related trigeminal neuralgia: A multicenter retrospective study. J Pain Res 2022;15:2303-13.