

Management Of Acute Episode Of Trigeminal Neuralgia: A Case Report

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Abstract:

Background: Trigeminal neuralgia is one of the most common cause¹ of facial pain which causes functional incapacitation. Patient gets pain on trivial stimulus like chewing, talking and sometimes even small breeze of air also can induce pain. Patients are usually treated with anti-convulsants like oral Carbamazepine² but when conservative management fails or is not tolerated, there are various invasive options available including surgery. Gasserian Ganglion Radio Frequency Ablation (RFA) is very commonly opted procedure for refractory cases with co-morbidities³. Percutaneous RFA involves very precise needle positioning for heating of the nerve at particular temperature. We present a unique case of Trigeminal neuralgia with an acute episode. As standard treatment for trigeminal neuralgia is to proceed for RFA, for this patient the pain was so severe that we had to optimise her pain with intravenous (IV) medications before proceeding for RFA.

Case Presentation: An 82-year-old female known case of trigeminal neuralgia since 3 years was treated with oral carbamazepine. She came to our emergency ward with acute exacerbation, complaining of severe right sided facial pain. Pain was so severe that oral intake was not possible and a nasogastric tube had to be inserted for enteral feeding. The definitive treatment for TN is super selective radiofrequency ablation where patient's cooperation is of paramount importance. This was not possible in our case due to severe pain. Patient was initially stabilized with pharmacotherapy. After initial symptomatic relief, she was posted for RFA of trigeminal nerve on Day three of admission. The procedure was performed by experienced pain physician with fluoroscopy guidance. The patient had reduction in pain by almost 20-30% on table. Patient was discharged home on 2nd day post-procedure. Patient had complete pain relief in next two weeks.

Conclusion: Though RFA remains standard of care for elderly patients with Trigeminal Neuralgia, not every time we can proceed with the procedure directly. Tailoring the treatment according to patient's presenting complaints and having patient's cooperation while performing RFA, especially in this case was key to our success.

Keywords: Trigeminal neuralgia, Pre Procedural optimization, systemic desensitization, Gasserian ganglion radio frequency ablation.

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I. Introduction

Chronic facial pain can have numerous differential diagnoses. Amongst them Trigeminal neuralgia (TN) has high incidence in this group¹. Trigeminal neuralgia presents with sharp shooting facial pain which comes in paroxysmal episodes. Most of the times aggravated by stimulus like chewing, talking, rinsing the mouth or in advance cases breeze of air over the face is intolerable. Idiopathic TN has no specific causative factor. Exact pathophysiology of TN remains unclear but morphological changes of 5th Cranial nerve root are commonly seen in patients suffering from TN. Chronic demyelination of 5th nerve warrants generation of action potential without any stimulus. TN has incidence of 4-5/100,000 of the population. Incidence is twice as high as for females also increases with age where in patients more than 75 years of age it is seen to be 1 in 1000.⁴

TN can be quite debilitating disease with lancinating pain coming in paroxysms. The disease is known as "Fothergill's disease" or "tic douloureux." Treatment option ranges from conservative, non-surgical treatments to surgery in the form of microvascular decompression (MVD). Initial part of treatment is antiepileptics or Tricyclic anti-depressants TCA or sometimes psychotherapy to deal with excruciating pain. When these fail, standard of care for elderly patients, especially those who are high risk for surgery because of their comorbidities is Percutaneous Radiofrequency Ablation (RFA). MVD has highest morbidity rates and is reserved for younger population of patients.

RFA technique involves manoeuvring an RF needle through the foramen ovale, into the Meckel's cave so as to selectively ablate involved branches of the Trigeminal nerve under continuous image guidance. Once the target site is reached, the RF needle tip is heated to a temperature of 60 degrees Celsius to ablate the nerve.

Usually this is done as planned procedure with patient awake and cooperative so as to confirm the exact location. Hereby we present a case where, procedure is done in a patient with acute exacerbation where

optimization of the same played a pivotal role in achieving satisfying results. Gasserian ganglion RFA is the standard of care for Trigeminal neuralgia patients. This procedure is quite beneficial for elderly patients also for patients with co morbidities in whom MVD surgery can be risky and debilitating. When done as planned procedure, it has a good success rate. We present a case of acute trigeminal neuralgia where RFA for Gasserian ganglion was done as definitive management but with prior optimization of acute episode of pain so as to have full patient cooperation and at most accuracy.

II. Case Report

An 82-year-old female known case of trigeminal neuralgia since 3 years was treated with oral carbamazepine. She had multiple comorbidities in the form of diabetes, hypertension, ischemic heart disease and hypothyroidism. She came to our emergency ward with acute exacerbation, complaining of severe right sided facial pain in the distribution of maxillary branch (V2). Magnetic resonance imaging (MRI) showed an abnormal vascular loop along the cistern of the right trigeminal nerve causing compression. Pain was so severe that her oral intake was bare minimum. This prompted us to insert nasogastric tube for enteral feeding. First line of therapy including carbamazepine³ and pregabalin was poorly tolerated leading to excessive drowsiness. The definitive treatment for TN is super selective radiofrequency ablation and we decided to post her for the same but could not proceed directly as patient was in severe pain. This was not possible in our case due to severe pain. To manage her pain we started her on paracetamol and tramadol but patient had only partial pain relief. We, then decided to go ahead with intravenous preservative free lignocaine in adjusted dosages for pain relief. It was done in Intensive care unit (ICU) care under continuous monitoring. After initial good relief, additional buprenorphine patch was applied.

The procedure was performed by an experienced pain physician under fluoroscopy guidance. After confirming nil by mouth status and preoperative investigations, patient was taken in operating room. Standard monitors were attached and mild sedation was given by anaesthesiologist. Manoeuvring of the 22G RF cannula (10 cm with 5mm tip) was assisted by live fluoroscopy and executed in sterile fashion. Needle position was at the angle of petrous temporal bone with clivus which was confirmed on fluoroscopy in lateral view. The maxillary branch was stimulated. Sensory stimulation was done at 0.5Hz in incrementally to know the distribution of pain, and was obtained at 0.3v, Motor stimulation at 2Hz was done. Two lesions were performed at 60 degrees Celsius for 90 seconds rotating the cannula.

The patient had reduction in pain by almost 20-30% on table. Patient was discharged home on 2nd day post-procedure. Patient had complete pain relief in next two weeks.

III. Discussion

According to definition by International Headache Society, trigeminal neuralgia is “disorder characterized by recurrent, brief, unilateral shock like pain, abrupt in onset and termination limited to distribution of one or more than one division of trigeminal nerve and triggered by innocuous stimulus.” Pathophysiology of trigeminal neuralgia is not very clear but compression at root entry trigger zone causes demyelination and causes ectopic discharge giving rise to pain episodes. This is seen in cases of multiple sclerosis or many times due to external compression from vascular loop is seen. It can be secondary to tumour as well. Prevalence of the disease varies from 0.3% to 3% with higher preponderance in females. Worsening of severity and frequency is seen over the period of time also sometimes pain is present continuously.

Usually, history gives the clue towards diagnosis of Trigeminal Neuralgia. Neurological examination is normal in these patients. Diagnostic criteria given by International society of Headache is in **Table1**⁵

Classical:
A. Paroxysmal attacks of pain lasting from a fraction of a second to 2 min, affecting one or more divisions of the trigeminal nerve, and fulfilling criteria B and C
B. Pain has at least one of the following characteristics:
1. Intense, sharp, superficial, or stabbing
2. Precipitated from trigger zones or by trigger factors
C. Attacks are stereotyped in the individual patient
D. There is no clinically evident neurologic deficit
E. Not attributed to another disorder

MRI scan is the choice of investigation⁶ for confirming underlying pathology. MRI Scanning augmented with 3-dimensional echo sequence or intravenous gadolinium DTPA scanning can enhance visualization for vascular compression around trigeminal nerve root. We had done MRI brain with trigeminal sequence for our patient and reached a diagnosis.

The treatment for idiopathic trigeminal neuralgia is tricky. Starts with conservative line of management in the form pharmacotherapy.

Surgical treatment is also available in the form of microvascular decompression (MVD).⁷

Non-surgical ablative techniques are showing promising results and have become treatment of choice for patients of trigeminal neuralgia. Percutaneous radiofrequency ablation is one of these techniques.

RFA of Gasserian ganglion was our obvious choice of treatment but before proceeding for the same, optimization of our patient was very important step.

Whenever planning any procedure, we check fitness of the patient. If patient has any deranged parameters, we need to correct those prior to procedure.

In our patient we had only limited time as patient was in extreme pain also with having many co-morbidities made it a daunting task to optimize her. The development of science and technology with the inventions of newer analgesics, provides a unique combination with a multimodal approach to treat pain.⁸

According to WHO guidelines, opioids are the choice of analgesics for severe pain. So, we started her on tramadol. Patient had some pain relief but not adequate to proceed for procedure. We decided to go ahead with systemic desensitization. We used intravenous lignocaine⁹ for the same. Lidocaine acts by prolonging sodium channel inactivation, blocking NMDA receptor and preventing secondary hyperalgesia. In patients of chronic pain, it is used to modulate central and peripheral sensitization. In terms of central sensitization, lidocaine showed antihyperalgesic periphery effect on bodily pain and primary impact on neuropathic pain, which results in fundamental hyperexcitability blockage. A dosage below 5 mg/kg that is given slowly (30 minutes), under monitoring, is considered safe. Systemic desensitization produces rapid analgesia and can give long term relief from pain.

As systemic desensitization requires meticulous monitoring, especially in our patient, we decided to shift patient in ICU. Under continuous monitoring, intravenous lignocaine was given in the dose of 3mg/kg over 1 hour. We increased the dose to 4mg/kg next day. After second dose of lignocaine patient had good pain relief. We added Buprenorphine patch for sustained pain relief. Now that patient had been optimized adequately, we decided to proceed for RFA.

RFA is very commonly used procedure for trigeminal neuralgia. It is non-invasive, with good results. So, nowadays it has become one of the mainstream treatments for TN. One of the important factor is RFA at Gasserian ganglion gives quick result where patient feels significant pain relief on table itself. During RFA procedure, patient is taken into OT, under mild sedation the procedure is carried out under fluoroscopy guidance. When the needle reaches the end point, nerve is stimulated, at this point patient's response will decide exact location for RFA. So, precision of this procedure is mainly based on patient's co-operation. For RFA, there are several studies available to corroborate these findings. A systematic review of the literature, published in 2016, showed that RFA had a success rate of 85-90% in the treatment of TN and a recurrence rate of 5-10%. A meta-analysis of RFA for TN published in 2017, including 13 studies and 1,146 patients, claimed that RFA had a success rate of 89.2% and a recurrence rate of 7.9%. A study published in the Journal of Neurosurgery in 2015, having 104 patients, reported a success rate of 94% after a mean follow-up of 16.8 months. In comparison to surgery RFA has been found to be cost-effective, so says the study published in the Journal of Craniofacial Surgery in 2020.

We performed RFA of Gasserian ganglion as described above and achieved a satisfying result.

IV. Conclusion

In conclusion, Gasserian ganglion RFA remains the standard treatment for trigeminal neuralgia, especially in elderly patients. We emphasize that in case of our patient managing acute episode with multimodal analgesia, meticulously planning our procedure considering all her co morbidities and accurate timing where her maximum cooperation could be elicited was key to our success.

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