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Case Report

Unmasking trigeminal neuralgia: A case study on diagnosis and treatment

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Abstract

Trigeminal neuralgia (TN) is a severe, chronic pain disorder affecting the trigeminal nerve, often described as one of the most excruciating conditions known to medicine. This case study presents a detailed examination of a patient diagnosed with TN, highlighting the diagnostic challenges, treatment approaches, and patient outcomes. We explore the role of imaging, differential diagnosis, and the efficacy of pharmacological and surgical interventions, including microvascular decompression and radiofrequency ablation. Through this case, we aim to enhance understanding of TN's clinical presentation and management strategies, providing insights for healthcare professionals in optimizing patient care.

Keywords: Trigeminal neuralgia, Trigeminal nerve pain, Facial nerve pain, TN disorder, Chronic facial pain, Microvascular decompression.

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1. Introduction

Trigeminal neuralgia (TN) is a chronic pain condition affecting the trigeminal nerve, one of the most widely distributed nerves in the head. It is characterized by sudden, severe, and often debilitating facial pain, typically on one side of the face. The pain can be triggered by routine activities such as speaking, eating, or even a light touch.[1]

This condition is often described as one of the most excruciating pain disorders known to medicine. While its exact cause varies, TN is commonly associated with nerve compression, multiple sclerosis, or other neurological disorders. Diagnosis is based on clinical symptoms, and treatment options range from medications and nerve blocks to surgical interventions.[9]

This article explores the causes, symptoms, diagnosis, and treatment options for trigeminal neuralgia, providing a comprehensive understanding of this complex and often misunderstood condition.

2. Case Report

Patient Name	XYZ
Patient ID	00201375
MRD No.	138 1555
Father's Name	XYZ
Ward	Emergency Surgical
Unit	Neuro-Surgery
Bed No.	12
Age	64 years
Sex	Male
Address	XYZ
Diagnosis	Trigeminal Neuralgia
Date and Time of Admission	03-06-2022 / 12:13:09 AM
Patient Type/Category	Emergency / AB-NHPM

1. Chief complaints (Reason for Hospitalization)

i. 65-year-old male presented with complaints of:
   a. Pain on the right side of the face.
   b. Pin-pricking sensation on the same side of the face for 30 years ago.

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2. **History of present illness**
   i. The patient experienced an increase in the intensity of these symptoms from the last 3 months. It was also associated with increased temperature and numbness of that side of the face. No radiation or referral of pain. Aggravated on touching and on heat exposure.
   ii. Patient has been experiencing these symptoms from the past 30 years for which he has been taking "Nerve block" for pain, but from the last 3 months, the symptoms have been exaggerated.

3. **Personal history:**
   i. Smoker, no other addictions.

4. **Family history**
   i. Non-significant family history.

5. **Socio-economic status:**
   i. Marital Status: Married
   ii. Number of Children: 02
   iii. Total Monthly Income: 10,000/month
   iv. Housing Condition: Solid/Permanent (Pucca) house
   v. Electricity Facility: Available

6. **Personal history:**
   i. Diet: Mixed diet
   ii. Hygiene: Satisfactory
   iii. Lifestyle: Smoker

7. **Environmental history:**
   i. Drinking Water Supply: Tap Water
   ii. Sanitation: Good / Acceptable
   iii. Waste/Excreta Disposal: Dumping
   iv. Presence of Flies/Mosquitoes/Rodents: No

8. **Psychosocial history:**
   i. Language: Kashmiri
   ii. Relationship with Family Members: Good
   iii. Social Support: Available and Good

9. **Physical Examination:**
   i. CNS): GCS): 15/15
   ii. GIT (Gastrointestinal Tract): Soft on palpation, non-distended
   iii. CVS (Cardiovascular System): S1 S2 +

10. **Vital Assessments**
   i. Pulse Rate: 80 beats per minute (bpm)
   ii. SpO2 (Oxygen Saturation): 95%
   iii. BP (Blood Pressure): 120/75 mmHg

Table 1: Laboratory investigations

Hemogram (Complete Blood Count):		
Hb	**TLC**	**PLT**
13.0 g/dL	4.16 cells/mm³	113 cells/mm³
KFT (Kidney Function Tests):		
Urea		**Creatinine**
46.2 mg/dL		1.074 mg/dL
LFT (Liver Function Test) Results:		
Parameter	**Test Results**	**Reference Range**
Bilirubin	0.9	0.1 - 1.2
AST	17.14	0 – 35
ALT	13.07	0 – 41
ALP	89	40 – 129
Protein	7.90	6.4 - 8.3
Albumin	4.99	3.5 - 5.2

2.1. Disease condition: Trigeminal neuralgia

1. **Description of the disease condition**
   i. Chronic irritation of the fifth cranial nerve results in Trigeminal neuralgia, also known as tic douloureux.[2]
   ii. Pain Areas: The location of pain depends on which branch of the trigeminal nerve is affected:
      a. Maxillary Branch: Pain occurs in the sides of the nose, lower eyelid, upper teeth, gums, and cheeks.
      b. Ophthalmic Branch: Pain is felt in the eye, nose, and forehead.
      c. Mandibular Branch: Pain occurs in the lower teeth, jaw, gums, and lower lip.[2]

Table 2: Etiology / Risk Factors:

Book Picture	**Patient Picture**
1. Tumor 2. Swollen blood vessels 3. Nerve damage 4. Aging 5. Multiple Sclerosis 6. Stroke 7. Brain lesions 8. Facial trauma 9. Lyme Disease 10. Family history 11. Surgical injury 12. Aneurysm[3]	1. Trigeminal nerve is indented upon (compressed) by the right superior cerebellar artery. 2. Age 65 years

Table 3: Clinical manifestations

Book Picture	**Patient Picture**
1. Constant aching and burning sensation 2. Severe shooting or jabbing pain[4]	1. Pain on the right side of the face 2. Pin and pricking sensation 3. Increased temperature and numbness of the right side of the face.

Table 4: Diagnostic evaluation

Book Picture	Patient Picture
1. History Collection 2. Physical Examination 3. Neurological Examination 4. MRI (Magnetic Resonance Imaging) 5. MRA (Magnetic Resonance Angiogram)[5]	1. Health History 2. P.E 3. N. Examination 4. Pain Description ✓ Location ✓ Type 5. MRI

1. Management (according to Book):

i. Medical management:

a. Anticonvulsants: Medications like Carbamazepine, Clonazepam, and Phenytoin are used to prevent seizures and can also help manage nerve pain.[6]

b. Botox (Ona botulinum toxin A) Injections: Botox injections can help relieve pain by relaxing muscles and reducing nerve stimulation.[6]

c. Antispasmodic Drugs: Baclofen is mentioned as an example; these drugs help relax muscles and reduce spasms that may contribute to pain.[6]

d. Alcohol Injections: Injections of alcohol into the affected nerve can provide temporary pain relief by blocking nerve signals.[6]

ii. Surgical management:

a. **Microvascular decompression (MVD):**[7] In this surgical procedure:
A small incision is made behind the ear near the site of the pain. A hole is drilled in the skull to expose the trigeminal nerve. A piece of padding (often made of Teflon) is placed between the nerve and the blood vessel (usually an artery or vein) that is compressing it. This relieves pressure on the nerve and reduces pain.

b. Percutaneous Glycerol Rhizotomy (PGR): [7] Involves inserting a needle through an opening at the base of the skull, into the trigeminal nerve. A small amount of sterile glycerol is injected, damaging the nerve and interrupting pain signals. Pain relief is usually experienced within a few hours.

c. Gamma Knife Radiosurgery: [7] A high dose of radiation is focused on the trigeminal nerve root to cause targeted damage, relieving pain.

d. Percutaneous Stereotactic Radiofrequency Thermal Rhizotomy: Electrical currents are used to destroy nerve fibers associated with pain.

e. Brain Stereotactic Radio Surgery:[7] Radiation is applied to the trigeminal nerve to alleviate pain.

f. Radiofrequency Thermal Lesioning:[7] Destruction of nerve fibers related to pain using heat.

2. Treatment given to patient:

i. Endoscope assisted microscopic microvascular decompression with Teflon interposition: This is a surgical procedure to relieve pressure on the trigeminal nerve by placing Teflon padding between the nerve and the compressing blood vessel.

ii. Inj Supacef 1.5gm IV/BD: Injectable antibiotic (Ceftriaxone) given intravenously twice a day (BD).

iii. Inj Dilantin 100mg IV/TID: Injectable anti-seizure medication (Phenytoin) given intravenously three times a day (TID).

iv. Inj Amikacin 750mg IV/OD: Injectable antibiotic (Amikacin) given intravenously once a day (OD).

v. Inj PCM 1gm IV/TID: Injectable painkiller (Paracetamol) given intravenously three times a day (TID).

vi. Inj Mannitol 100ml IV Stat: Injectable Mannitol 100ml intravenously, stat.

vii. Inj Pantop 40mg OD: Injectable Pantoprazole 40mg orally/by mouth.

viii. Inj Ondem 8mg SOS: Injectable Ondansetron 8mg as needed.

3. Assessment:

i. **Subjective data:** After introduction, the patient as well as his attendant agreed to explain the problem. The patient had complaints of pain on the right side of the face for 30 years but had experienced an increase in the intensity for 3 months. The patient described it as pricking pain.

ii. **Objective data:** On assessing the patient, he seemed in pain, distress, and irritable.

a. Vital Signs:

b. PR (Pulse Rate) - 80/min

c. SpO2 (Oxygen Saturation) - 95%

d. BP (Blood Pressure) - 120/75 mmHg

Table 5: Nursing care plan

Nursing Diagnosis	Goal	Nursing Interventions	Evaluation
• Chronic pain related to compression of trigeminal nerve as evidenced by patient's self-report of pain	• To reduce pain and provide comfort to patient	• Assessed the patient to determine triggers • To assessed pain level and characteristics of pain • Determined patient's current medication use	• Pain was reduced to some extent

• Ineffective coping related to inability to conserve adaptive energies as evidenced by lack of cooperation during treatment	• Patient identifies personal strengths and accepts support through the nursing relationship	• Determined the patient's understanding of the stressful situation • Provided chances to express concerns, fears, feelings, and expectations • Provided information the patient wants and needs	• Patient described and initiated effective coping strategies
• Low Self-esteem related to Stigma associated with the Condition as evidenced by change in Usual patterns of responsibility	• Patient will verbalize improved Self-esteem in relation to diagnosis	• Explored feelings about diagnosis, the perception of threat to self • Encouraged expression of feelings	• Patient verbalized improved Self-esteem
• Imbalanced Nutrition less than the Body requirements related to pain during chewing	• Patient will maintain balanced Nutritional intake	• Assessed the Nutritional Status of the patient • Advised to avoid the foods that are too hot or cold and chewing food in the affected site	• Nutritional Status was maintained

Table 6: Drug chart

Name of Drug	Pharmacological Action	Dosage	Route	Indication	Contraindication	Side Effects	Nurses Responsibility
Inj Mannitol	The mannitol causes the cells in the brain to dehydrate mildly. It is an osmotic Diuretic which causes the water inside the brain cells to leave and draw into the blood stream.	100ml	IV	• Increased intracranial pressure • Cerebral edema • Elevated intraocular pressure • Acute Renal failure	• Anuria • Pulmonary edema • Severe pulmonary congestion • Active intracranial bleeding	• Nausea • Vomiting • Headache • Dehydration	• Vigilant monitoring of electrolytes and overall fluid balance. • Observation for signs of cardiopulmonary complications.
Inj Dilantin	It is a major antiepileptic drug. It causes blockade of the voltage dependent sodium channels and stabilizes the neuronal membrane	100mg	IV	• Grand mal seizures • Psychomotor seizures • Alcohol withdrawal syndrome • Cardiac arrhythmias • Status epilepticus • Seizures during neurosurgery	• Hematologic disorders • Hepatic dysfunction • Complete heart block • Sinoatrial block	• Dysphagia • Diarrhea • Abdominal Pain • Depression • Tremors • Osteomalacia • Numbness	• Use parental solutions immediately after mixing • Inform patient that it may harmlessly turn color of urine from pink to reddish brown
Inj Supacef (Cefuroxime)	Belongs to the cephalosporin class of antibiotics, disrupting the synthesis of the peptidoglycan layer of bacterial cell walls.	1.5 gm	IV	• Gram-negative infections • Surgical prophylaxis • Meningitis • Mixed Aerobic and anaerobic infections	• Hypersensitivity • Infants less than 01 months	• Nephrotoxicity • Diarrhea • Pain • Skin Rashes	• Monitor for anaphylactic reactions. • Monitor for nephrotoxicity.
Inj PCM	It is an analgesic (pain reliever) and antipyretic that works by blocking the release of chemical messengers that cause pain and fever	1 gm	IV	• Pain relief • Fever	• Hypersensitivity • Hepatic (liver) impairment	• Stomach pain • Nausea • Vomiting	• Monitor for signs of liver toxicity and liver enzymes should be assessed for elevations.

1. Health education

i. Advised the patient not to do any specific activities that seem to trigger the pain.[10]

3. Discussion

The case on current study took place in June 2022. The client was a 64-year-old male who presented the complaints of pain and pin- pricking sensation on the right side of the face. This case highlights the importance of early diagnosis and tailored treatment modalities. While medical therapy is often the first-line treatment, surgical options such as MVD can be highly effective in cases where medications are insufficient. The role of imaging in identifying nerve compression is crucial, as it helps guide appropriate interventions.[8]

4. Conclusion

A 65-year-old male admitted to SKIMS [Sher-i-Kashmir Institute of Medical Sciences] with Trigeminal Neuralgia. The patient has been in the Neuro ICU for 3 days, during which complete care was given. Proper medications were given, and the patient was observed for complications. After improvement in the patient's condition, he was transferred to the Neuro-Surgery ward.

5. Source of Funding

None.

6. Conflict of Interest

None.

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