
PERPLEXING IMPACTED THIRD MOLARS IN A CASE OF TRIGEMINAL NEURALGIA AND ARACHNOID CYST (CASE REPORT)

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KEYWORDS

arachnoid cyst, impacted third molars, trigeminal neuralgia,

ABSTRACT

Introduction: Trigeminal neuralgia (TN) is the most frequent form of craniofacial neuropathic pain, with a wide range of severity. Trigeminal neuralgia classically has been associated with neurovascular compression in the prepontine cistern at the nerve root entry zone or in Meckel's cave due to an abnormal vessel, tumor, or cyst. Arachnoid cysts of the posterior cranial fossa are still less commonly compared to those superior to the constituent part of the posterior cranial fossa meninges. However, the arachnoid cyst in conjunction with the impacted third molar may cause compression of the trigeminal ganglion with similar clinical symptoms. The aim of this report is to explain the management of the first division of trigeminal neuralgia with an arachnoid cyst perplexed by impacted third molars. **Case report:** A case of a 27-year-old female with throbbing pain on top of her head, forehead, temple, and eyes several times. Extensive clinical and radiologic examinations were performed and revealed an arachnoid cyst and impacted third molars. Impacted third molars were removed. The patient declined the surgery for the arachnoid cyst and was treated symptomatically with amitriptyline 25 mg once daily until recently. The definitive diagnosis was the first division of trigeminal neuralgia and an arachnoid cyst. **Conclusions** A fundamental aspect of the diagnosis of trigeminal neuralgia is to examine and exclude all possible underlying etiologies and structural pathologies, which can refer the pain to a location remote from the stimulus.

INTRODUCTION

Trigeminal neuralgia (TN) is rarely caused by an arachnoid cyst and has been associated with neurovascular compression in the cerebellopontine angle, which expands to regions that intersect the trigeminal nerve.^{1,2} Arachnoid cysts can lead to elevated intracranial suppression or cranial nerve

deficiencies.^{3,4} MRI imaging features allow a positive diagnosis of an arachnoid cyst.^{5,6}

There are no previous reports of trigeminal neuralgia cases generated by an arachnoid cyst in cases of impacted third molars. The aim of this report is to explain the management of the first division of trigeminal neuralgia with an arachnoid cyst perplexed by impacted third molars.

CASE AND MANAGEMENT

A 27-year-old female with impacted third molars was treated by an oral medicine specialist and neurologist because of sharp and throbbing pain in the superior right of the facial region, followed by lacrimation (tear eye), restricted to the frontal, supraorbital, and temporal zones, which intensified during conversation, mastication, rubbing, and blowing of air. Her severity index on the numerical rating scale (NRS) was 8. No vision impairment, cranial nerves (CN), motor nor sensory deficiencies, and abnormalities were found on the extra-oral and intra-oral examinations. The radiograph result can be seen in figures 1a and 1b. The impacted teeth were removed, yet they did not resolve any pain. The vital signs and hematology laboratory results were in normal condition.

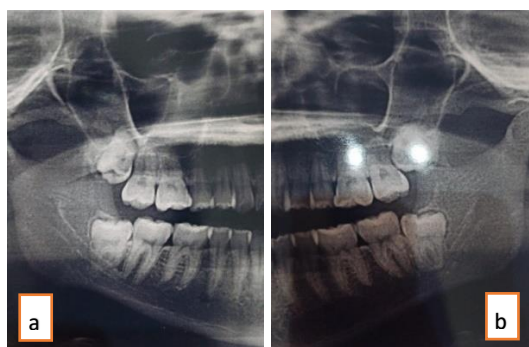


Figure 1. Right (a) and left (b) Impacted maxillary and mandibular third molars.

Treatments with carbamazepine and other oral analgesics for 2 months reduced her facial pain severity index to NRS 5, and she noted that carbamazepine only partially relieved her symptoms. The first result of the MRI showed a large arachnoid space size of 2.1 x 2.5 x 3.3

cm on the right anterior of the frontal lobe, which deforms the tabula interna and diploe of the right frontal bone; dilatation of the right cisterna magna. There were no signs of cortical dysplasia, infarction, gliosis, neither vascular malformation. A CT scan was performed (Figure 2).

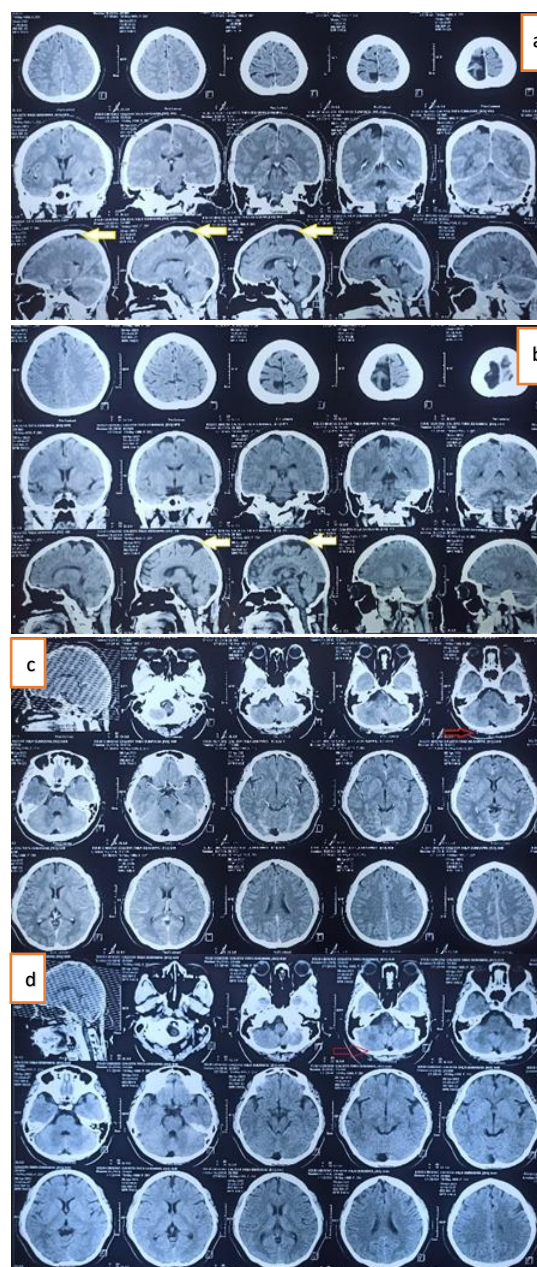


Figure 2. On computed tomography (CT) visualizing a hypodense lesion prominent in the posterior of cranial fossa and concavity of dextral parietal and concavity of dextral parietal in yellow arrows (a,b) and a hypodense

lesion prominent in the posterior of cranial fossa in red arrows (c,d).

The definitive diagnosis was first-division trigeminal neuralgia caused by an arachnoid cyst. The differential diagnosis was a tension-type headache. The patient declined surgery, had received an explanation, and was treated symptomatically with amitriptyline 25 mg once daily until recently.

One year later, the patient has adapted and complains less compared with her previous visits, with a severity index of 3 on the numerical rating scale (NRS). The second result of the MRI showed an arachnoid space size of 2 x 1.5 x 2 cm on the midline fossa posterior; there was no enhancement in intralesion perfusion of cerebral blood volume or cerebral blood flow.

DISCUSSION

The arachnoid cyst in coincide with the impacted third molar may cause compression of the trigeminal ganglion; therefore, the patient in this case suffered from trigeminal neuralgia. Actuation of A- δ fibers develops in excruciating distinctive confined pain, to the same degree that occurs in impacted teeth. C-fibers, on the contrary, are responsible for continuous, less intense painful perceptions such as orofacial pain, which is usually characterized by obscure localization.⁷ Indistinct clinical presentations include chronic cephalgia, convulsions, and reduced scholastic ability.³

Any pathological or traumatic discontinuity of tissue or loss of function of a part in the superior orbital fissure or sphenoid cleft induces the implication of V1 nerves.⁸ Excitation of nerve C-fibers and α - δ fibers as nociceptors of the ophthalmic nerve causes the discharge of substance P (SP), calcitonin gene-related peptide (CGRP), and tachykinins. A previous study showed the impacted third molars in the maxilla have a relationship with orofacial pain; on the contrary, there was no association for the impacted third molars in the mandible. This correlation was more proven in the sinistra maxilla and unrelated to the years, gender, academic degree, and selected mastication side. Older people and females had a lower impaction degree than males and younger fellows.⁷ On the contrary, the patient in this case report was a highly educated young female with impacted third molars (maxilla and mandible). There is no significant correlation between third molar level and position and episodic primary headache disorder, or different categories of headaches were obtained.⁷ The patient also had constant pain, and pain was only reduced for 2 hours after taking medications. There was no significant association between age or sexual category and impacted or extracted third molars and orofacial pain.⁷ Although in this case, all impacted 3rd molars had been removed, the complaint still exists. This possible mechanism could affect the nerve and induce several symptoms in our patient.

The etiology of arachnoid cysts has also been associated with trauma, mastoiditis, meningitis, and subarachnoid hemorrhage,⁹ although the patient confirmed never experiencing these conditions. The local mass effect can induce erosive depletion of the contiguous bone and the imprint or abnormal position of adjacent brain tissue.⁸ This type of cyst can also lead to abnormal function of specific cranial nerves, including CN V (trigeminal neuralgia), CN VI (diplopia), CN VII (hemifacial spasm and facial nerve palsy), and CN VIII (tinnitus and vertigo).⁵

The majority of arachnoid cysts are discovered in areas above the tentorium cerebelli, to a degree of 50% in the midcranial fossa. Arachnoid cysts are slightly less prevalent on the frontal convex structure and in the posterior fossa. In this case, right anterior frontal lobe involvement was discovered. Cysts developing in the posterior fossa are most frequently detected in the cisterna magna and cerebellopontine angle.¹⁰ Carbamazepine (CBZ) is the first-line drug of choice for trigeminal neuralgia with adverse effects such as drowsiness and unsteadiness of this medication.¹¹ Amitriptyline tricyclic blocks 5-hydroxytryptamine and noradrenalin neurotransmitters and inhibits sodium-gated channels. Amitriptyline has an analgesic effect independent of its antidepressant purpose.¹² The limitation of this case study is that surgery for an arachnoid cyst and other laboratory tests to rule out neurologic and

non-neuropathic conditions were not performed.

The medical and dental professions must consider referred pain when investigating the etiologies of orofacial pain.⁹ A thorough diagnostic method is associated with the complexity of the basic anatomical cranium and various processes of referred pain to overcome the complexity and determine the definitive diagnosis.⁷

CONCLUSION

A fundamental aspect of the diagnosis of trigeminal neuralgia is to examine and exclude all possible underlying etiologies and structural pathologies, which can refer the pain to a location remote from the stimulus.

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