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Assessment of hemilateral pain and possible trigeminal neuralgia

Avaliação clínica de dor hemilateral e possível neuralgia do trigêmeo

Evaluación clínica de dolor hemilateral y posible neuralgia del trigémino

Paulo Henrique Moreira Melo[1], Graziella Soier de Souza[1], Giovanna Thaís Aparecida Neves[1], Camila de Souza Praes[1], Gabriela Cristina de Souza Figueiredo[1], Guilherme Paes Gonçalves Nogueira[1], Fabrício Groppo Rodrigues[1], Luís Felipe José Ravic de Miranda[1].

ABSTRACT

Objective: To report a case of trigeminal neuralgia observed in a 52-year-old patient who had pre-diabetes and hypertension, fibromyalgia as previous comorbidities, and a surgical history of carpal tunnel syndrome correction. **Case details:** On September 30, 2022, the patient reported intense right-sided unilateral headache. The patient was on Metformin, Hydrochlorothiazide (HCTZ), and Losartan. For the treatment of possible trigeminal neuralgia, Carbamazepine was initially prescribed at a dose of 200 mg every 12 hours and later adjusted to 200 mg every 8 hours. It was found that the dose of 600 mg per day of Carbamazepine was more effective in relieving the intensity of the pain and improving the patient's mood. Additionally, the patient underwent a magnetic resonance imaging which revealed the presence of vascular branches near the cisternal portion of the bilateral trigeminal nerve, more evident on the right side, without compression. Finally, it is worth noting that adjustments were made to the anti-hypertensive medications. **Final Considerations:** Trigeminal neuralgia presents a significant pain component for the patient, with a compromise to their quality of life. Therefore, early diagnosis coupled with the introduction of medication in an adjusted dose becomes essential.

Keywords: Trigeminal Neuralgia, Headache, Carbamazepine.

RESUMO

Objetivo: Relatar um caso de neuralgia do trigêmeo observado em um paciente de 52 anos que apresentava pré-diabetes e hipertensão, fibromialgia como comorbidades anteriores e um histórico cirúrgico de correção da síndrome do túnel do carpo. **Detalhes do caso:** Em 30 de setembro de 2022, o paciente relatou dor de cabeça intensa do lado direito. O paciente estava em Metformina, Hidroclorotiazida (HCTZ) e Losartan. O paciente foi diagnosticado com neuralgia do trigêmeo e Carbamazepina foi inicialmente prescrita na dose de 200 mg a cada 12 horas e posteriormente ajustada para 200 mg a cada 8 horas. Verificou-se que a dose de 600 mg por dia de Carbamazepina foi mais eficaz na redução da intensidade da dor e na melhora do humor do paciente. Além disso, o paciente realizou uma ressonância magnética que revelou a presença de ramos vasculares próximos à porção cisternal do nervo trigêmeo bilateral, mais evidente no lado direito, sem compressão. Finalmente, é importante destacar que ajustes foram feitos nos medicamentos anti-hipertensivos. **Considerações Finais:** A neuralgia do trigêmeo apresenta um componente significativo de dor para o paciente, com comprometimento da qualidade de vida. Portanto, o diagnóstico precoce aliado à introdução de medicação em uma dose ajustada torna-se essencial.

Palavras-chave: Neuralgia do Trigêmeo, Dor de Cabeça, Carbamazepina.

[1]Universidade Federal de Minas Gerais (UFMG), Belo Horizonte – MG.

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RESUMEN

Objetivo: Informar un caso de neuralgia del trigémino observado en un paciente de 52 años que presentaba pre-diabetes e hipertensión, fibromialgia como comorbilidades previas y antecedentes quirúrgicos de corrección del síndrome del túnel carpiano. **Detalles del caso:** El 30 de septiembre de 2022, el paciente informó una intensa cefalea homolateral del lado derecho. El paciente estaba tomando Metformina, Hidroclorotiazida (HCTZ) y Losartan. El paciente fue diagnosticado con neuralgia del trigémino y se prescribió Carbamazepina inicialmente en una dosis de 200 mg cada 12 horas y luego se ajustó a 200 mg cada 8 horas. Se encontró que la dosis de 600 mg por día de Carbamazepina fue más efectiva para aliviar la intensidad del dolor y mejorar el estado de ánimo del paciente. Además, se realizó una resonancia magnética que reveló la presencia de ramas vasculares cerca de la porción cisternal del nervio trigémino bilateral, más evidentes en el lado derecho, sin compresión. Finalmente, es importante destacar que se realizaron ajustes en los medicamentos antihipertensivos. **Consideraciones Finales:** La neuralgia del trigémino presenta un componente significativo de dolor para el paciente, con un compromiso en su calidad de vida. Por lo tanto, el diagnóstico temprano combinado con la introducción de medicación en una dosis ajustada es esencial.

Palabras clave: Neuralgia del Trigémino, Cefalea, Carbamazepina.

INTRODUCTION

Trigeminal neuralgia (TN) stands as one of the most enigmatic pain syndromes in the field of neurology. Historically referred to as the "suicide disease" due to its profound incapacitating pain, TN manifests as sharp, stabbing episodes of facial pain that are shockingly brief yet intense. These pain episodes can be precipitated by the most mundane of stimuli: speaking, eating, or even exposure to a light breeze (VASAVDA C, et al., 2022).

Epidemiological studies indicate that TN has a prevalence of between 4 to 29 individuals per 100,000 in the general population (LAMBRU G, et al., 2021). The disease shows a predilection for women and is more frequently diagnosed in those over 50 years of age (NURMIKKO TJ and ELDRIDGE PR, 2001). The trigeminal nerve, comprising three distinct branches, serves as the nexus of this disorder. Each branch transmits sensory information from specific facial regions to the brain. The hallmark of TN is its unilateral pain, which can involve any of these branches, making the precise localization of symptoms imperative for diagnosis (CRUCCU G, et al., 2020).

The pathophysiology of TN, though extensively researched, remains not fully understood. A prevailing theory suggests that vascular compression of the trigeminal nerve, primarily by aberrant blood vessels, leads to demyelination and erratic neural firing. However, other etiologies, including nerve sheath tumors, multiple sclerosis, or even idiopathic causes, have been postulated (CHEN G, et al., 2013 and SHANKAR KIKKERI N e NAGALLI S, 2022).

Irrespective of its root cause, TN's impact is seismic, often leading to severe psychosocial repercussions. Patients are known to suffer from anxiety, depression, and even social withdrawal due to the unpredictability and severity of pain episodes (CRUCCU G, et al., 2016; BERBER JSS, et al., 2005).

The diagnostic challenge TN poses is underscored by its clinical mimicry. Its symptoms can masquerade as dental pathologies, sinus infections, or even temporomandibular joint dysfunction. Hence, a meticulous clinical evaluation remains the cornerstone of diagnosis (SHANKAR KIKKERI N e NAGALLI S, 2022).

Complementing the clinical picture with neuroimaging, especially MRI, aids in visualizing vascular or neoplastic compressions. Electrophysiological tests further refine the diagnostic accuracy, discerning TN from other neuropathic pain syndromes (KHAN M, et al., 2017).

Managing TN is a multifaceted endeavor. The first line of treatment typically involves anticonvulsants like carbamazepine. However, some patients might be refractory to medications or might experience deleterious side effects. For such individuals, surgical interventions, such as microvascular decompression or gamma

knife radiosurgery, become viable alternatives. These procedures, while invasive, can offer significant relief and improve the quality of life (OBERMANN M, 2010). The holistic management of TN necessitates a multidisciplinary approach, drawing expertise from neurologists, surgeons, pain specialists, and even mental health professionals to ensure optimal patient outcomes (CRUCCU G, et al., 2020; CRUCCU G, et al., 2016; GOH BT, et al., 2001).

To enlighten the information presented, the importance of discussions regarding Trigeminal Neuralgia (TN) becomes increasingly apparent, especially when focusing on clinical practices. The challenge often lies not just in rapidly diagnosing the condition, but also in potentially having to adapt treatment methodologies based on the patient's unique circumstances.

Consequently, this study's main aim is to provide a detailed account of the clinical management of a patient who exhibited symptoms suggestive of TN, set against a complex backdrop of multiple concurrent medical conditions. This research was granted approval by the "Comitê de Ética em Pesquisa" (CEP, or Ethics Committee in Research in English), and carries the approval reference number 6.184.590. Furthermore, the study holds the "Certificado de Apreciação e Aprovação Ética" (CAAE, translated as the Ethical Appreciation and Approval Certificate) from Plataforma Brasil with the identifier 70197323.4.0000.5149.

CASE REPORT

On September 30, 2022, a 52-year-old female patient walked into the clinic with a health history that included hypertension, pre-diabetes, fibromyalgia (diagnosed in 2013 and treated with fluoxetine 20 mg), and a surgical intervention for carpal tunnel syndrome. She described a pronounced right-sided headache that persisted, interspersed with cluster-like episodes. Importantly, any form of touch or movement involving her face and neck seemed to exacerbate the pain.

To gain a more nuanced understanding of the neurological underpinnings, we conducted an exhaustive medical interview. When asked about the onset and progression of her headache, she revealed that the pain seemed to spontaneously appear, without a clear episodic pattern, but certain actions like chewing, speaking, or even a gentle breeze against her face could trigger these painful bouts. She denied experiencing visual disturbances or aura before the onset of the headache, and there was no mention of photophobia or phonophobia.

However, she did confirm the absence of tearing, nasal congestion, or any other autonomic symptoms, thus helping to rule out conditions like cluster headaches (LEROUX E; DUCROS A, 2008). During the physical examination, there was a concentrated effort to assess the integrity and function of the cranial nerves, especially the trigeminal nerve.

The sensory distribution along the ophthalmic (V1), maxillary (V2), and mandibular (V3) branches was tested, during which she exhibited sharp pain and heightened sensitivity, particularly in the V2 and V3 regions. The corneal reflex was intact, denoting the normal functioning of both the sensory (trigeminal nerve) and motor (facial nerve) components (KHAN ZA, 2021).

Additionally, despite the patient's regimen of Metformin 500mg twice daily, hydrochlorothiazide (HCTZ) 25mg daily, and Losartan 50mg daily, her blood pressure was notably high at 180/120 mmHg. This elevated hypertension, when combined with her described symptoms, strengthened the inclination towards trigeminal neuralgia as a primary diagnosis, overshadowing other potential diagnoses such as Horton's headache.

To manage her symptoms and address the hypertension, the patient received Captopril 25mg (2 tablets orally), Amlodipine 5mg every 12 hours orally, Carbamazepine 200mg (2 tablets orally), and an intravenous dose of Dipyrone 500mg/ml, balanced with a 0.9% normal saline solution. As she prepared to leave, she was prescribed a regimen of Carbamazepine 200mg to be taken orally every 12 hours and was scheduled for a return visit on October 4, 2022, to assess the progress and tweak the treatment plan if necessary.

On October 4, 2022, the patient returned for a follow-up appointment and reported feeling nauseous and dizzy after taking two tablets of Carbamazepine and one tablet of Amlodipine on Saturday. However, the

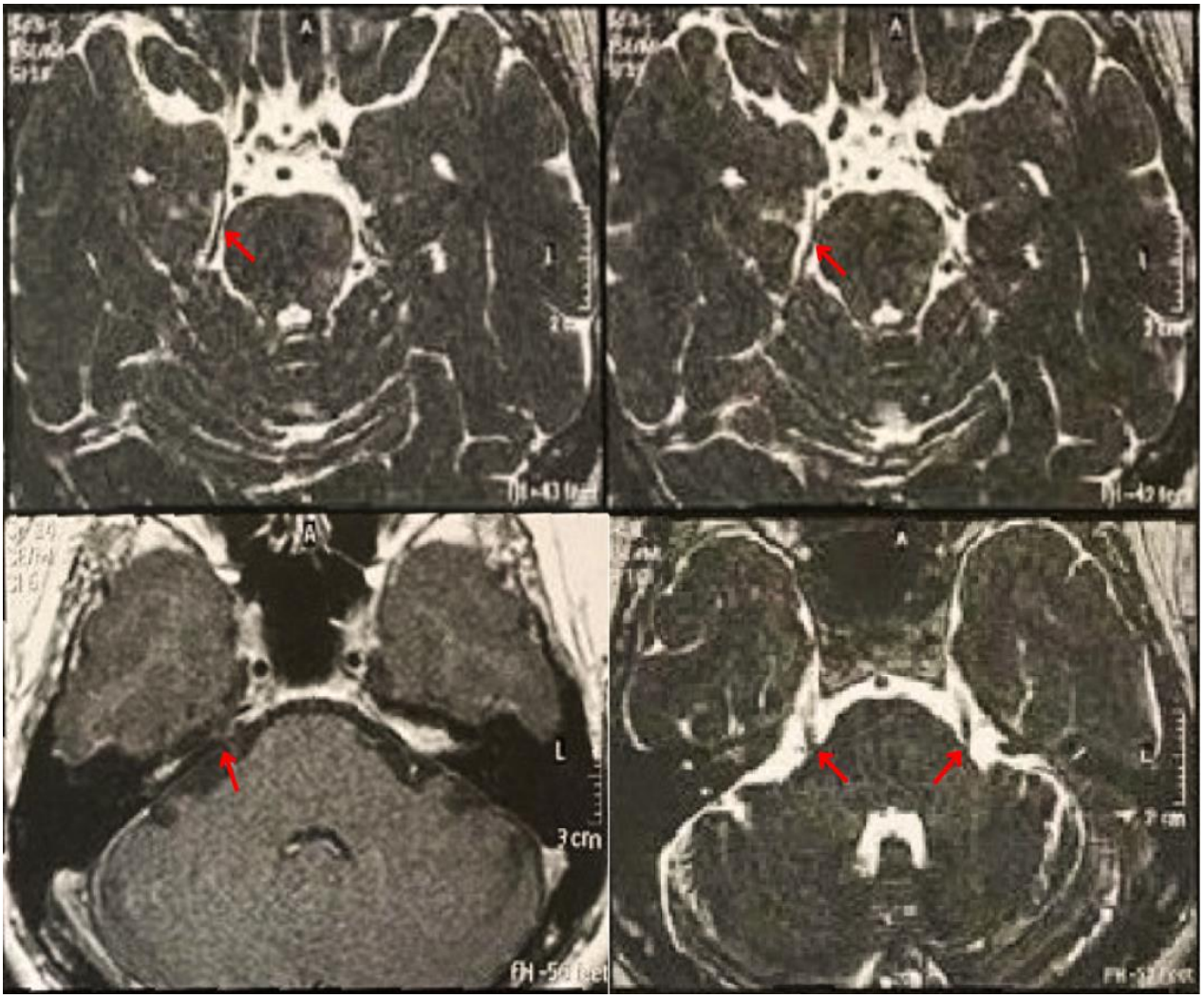
patient also reported a reduction in neck pain and improved head movement. The patient also reported having headaches for the past few weeks and using Cefaliv for relief. The physical exam revealed elevated blood pressure at 158/100 mmHg and a slightly palpable Ictus.

To further evaluate the patient's condition, the doctor recommended a cranial magnetic resonance imaging (MRI) to assess the trigeminal nerve, as well as tests to check liver function, complete blood count, and lipid profile. The patient was also advised to undergo an ECG and echocardiogram. The doctor renewed the patient's prescription for Carbamazepine and advised her to continue taking medication for hypertension, including Amlodipine 5mg twice a day, HCTZ 25mg once a day, and Losartan 50mg twice a day.

On October 25, 2022, the patient still presented with neck pain, with intensity 7 out of 10. The patient had undergone a cranial MRI, which revealed the presence of vascular branches near the cisternal portion of the trigeminal nerve bilaterally, more evident on the right side, without compression (**Figure 1- 4**).

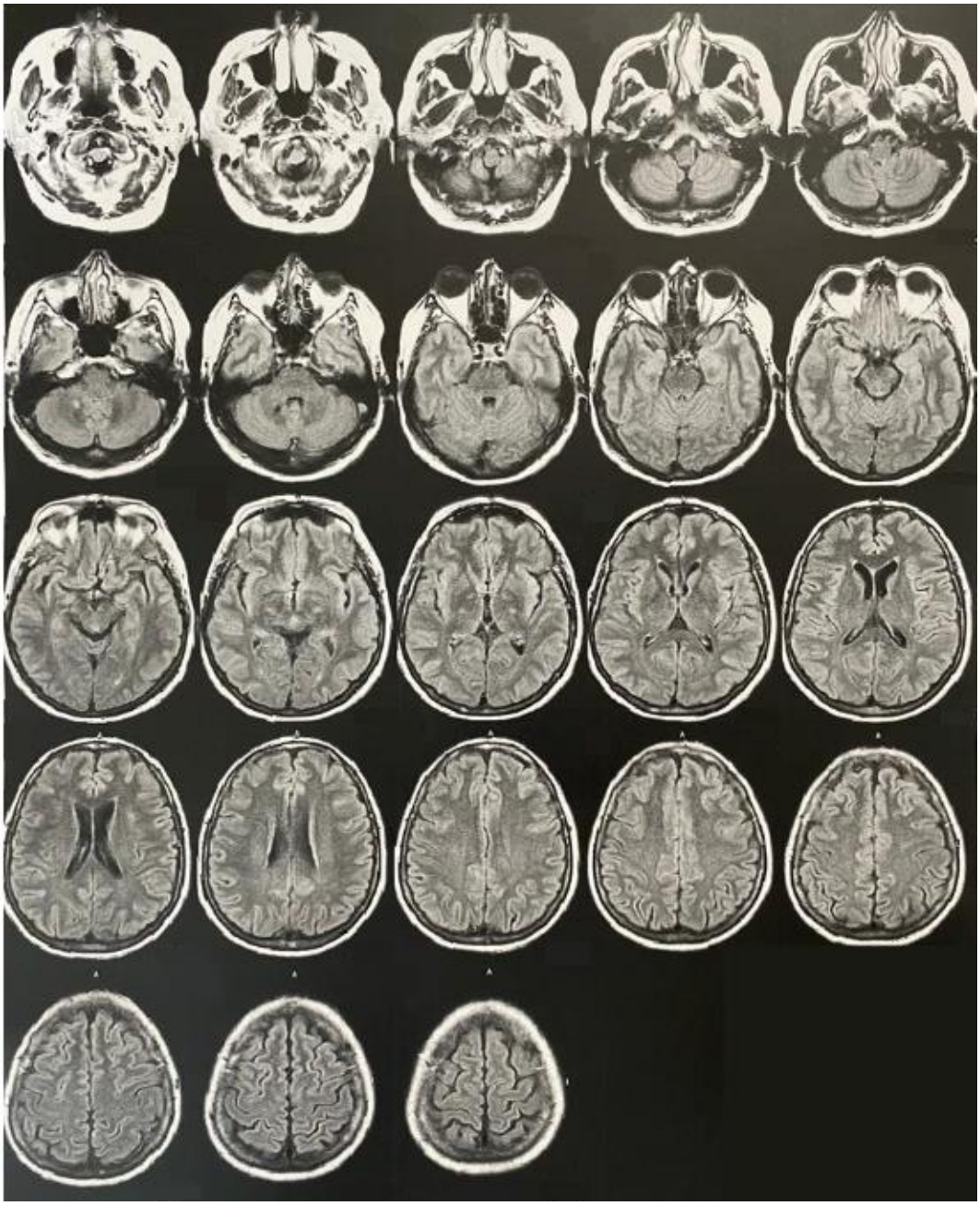
A hyperintense focus was also identified in FLAIR in the right frontal lobe, suggestive of non-specific gliosis/demyelination. The dose of Carbamazepine was increased to 200mg every 8 hours. On November 22, 2022, the patient reported improvement in mood and pain intensity since the adjustment of the Carbamazepine dose. The patient mentioned that there had been no further episodes of headaches since then.

Figure 1 – Magnetic resonance imaging of the brain. Red arrows highlight the vascular branches near the cisternal portion of the trigeminal nerve bilaterally, with a more pronounced presence on the right side. No compression is evident.



Source: Melo PHM, et al., 2023.

Figure 2 – Magnetic resonance imaging of the brain showing no detectable abnormalities.



Source: Melo PHM, et al., 2023.

DISCUSSION

In this case report, we present a patient who was diagnosed with trigeminal neuralgia and had a pre-existing diagnosis of fibromyalgia. In 2013, the patient was prescribed fluoxetine, at a dose of 20mg per day, despite current literature recommending duloxetine as the preferred medication (YEPEZ D, et al., 2022). It is worth noting that the choice of fluoxetine may have been due to the fact that the patient could obtain it for free through the Brazilian public health system (SUS). Additionally, the patient underwent surgery for carpal tunnel syndrome, which may have some relevance to her overall condition (VINCENT FM, et al., 1980). The coexistence of fibromyalgia might have contributed to the development or exacerbation of trigeminal neuralgia in this patient. Fibromyalgia, being a disorder characterized by widespread musculoskeletal pain, could potentially increase the sensitivity of the trigeminal nerve, or exacerbate the patient's perception of facial pain (KHAN M, et al., 2017; BRANDT R, et al., 2011).

Both fibromyalgia and trigeminal neuralgia have been associated with myofascial pain syndrome (MPS), which is characterized by the presence of trigger points in the muscles and fascia that can cause pain locally and in other areas of the body. MPS is frequently observed in patients with fibromyalgia, and may contribute to their symptoms. In a similar manner, myofascial pain dysfunction syndrome (MPDS), which is commonly associated with temporomandibular joint dysfunction, is a type of MPS that can affect the muscles of mastication and potentially contribute to the development of trigeminal neuralgia. (KHAN M, et al., 2017). Furthermore, the chronic nature of fibromyalgia pain may contribute to the increased risk of major depression in patients with both fibromyalgia and trigeminal neuralgia, as the debilitating effects of pain negatively impact daily functioning (YEPEZ D, et al., 2022; LØGE-HAGEN JS, et al., 2019).

Carbamazepine, an anticonvulsant medication, was used in this case to manage the patient's trigeminal neuralgia. Carbamazepine has been demonstrated to be effective in treating trigeminal neuralgia by stabilizing nerve membranes and reducing the excitability of nerve cells, thus alleviating pain (AL-QULITI KW, 2015; MAARBJERG S, et al., 2017). Initially, the patient experienced dizziness and nausea, which are common side effects of Carbamazepine (PELLOCK JM, 1987). However, these side effects subsided, and the patient reported improvement in neck pain, head movement, and mood after adjusting the dose of Carbamazepine (AL-QULITI KW, 2015; PELLOCK JM, 1987).

The cranial MRI findings of "presence of vascular branches near the cisternal portion of the trigeminal nerve bilaterally, more evident on the right side, without compression" could be indicative of vascular loops or other structures irritating trigeminal nerve, which may contribute to the patient's trigeminal neuralgia symptoms. Vascular compression of the trigeminal nerve is a well-documented cause of trigeminal neuralgia, and even in the absence of clear compression, the proximity of the vascular branches could still cause irritation or inflammation of the nerve (CHEN Q, et al., 2022). The hyperintense focus identified in FLAIR in the right frontal lobe, suggestive of non-specific gliosis/demyelination, may not be directly related to the patient's trigeminal neuralgia. However, it could be an incidental finding that warrants further investigation, as gliosis and demyelination can be associated with various neurological conditions (YAMAMORI C, et al.,1994). It is also worth considering that the neurovascular compression responsible for the patient's trigeminal neuralgia could independently lead to nerve demyelination, adding to the complexity of the situation (GAMBETA E, et al., 2020).

The increase in the carbamazepine dose from 400mg per day (200mg every 12 hours) to 600mg per day (200mg every 8 hours) appeared to have a positive effect on the patient's condition. The patient reported an improvement in mood and pain intensity since the dose adjustment, with no further episodes of headaches. This case highlights the importance of tailoring the treatment to the individual patient's needs and monitoring for side effects and therapeutic response to optimize the management of trigeminal neuralgia. While the typical dosage range for this medication is 200-400 mg according to most references, certain studies have suggested doses as high as 1200 mg per day. In the case at hand, it was found that a dosage of 400 mg was insufficient and the dosage had to be increased to 600 mg (WIFFEN PJ, et al., 2014; CRUCCU G, et al., 2020; GRONSETH G, et al., 2008; ZAKRZEWSKA, JM and LINSKEY ME, 2014). As per the recommended approach, the patient initiated the medication at a low dosage and gradually increased it until the desired therapeutic effect was achieved (CRUCCU et al., 2020; GRONSETH G, et al., 2008).

It may be appropriate to initially consider a spectrum of differential diagnoses for the patient's symptoms, based on their presentation and clinical complexity. Cluster headaches are frequently discussed in clinical settings due to their distinct presentation. Patients with this type of headache often report severe, localized pain around the eye or temple. This intense pain can persist from a few minutes to several hours and is often accompanied by autonomic symptoms such as tearing, nasal congestion, and sometimes even miosis or ptosis. Such clinical manifestations could prompt a practitioner to suspect cluster headaches, especially if the patient reports a history of recurrent episodes. Paroxysmal hemicrania, though less common, is another potential differential diagnosis to consider. Defined by its frequent daily attacks of intense unilateral pain, this condition can be debilitating. While its symptoms can be similar to those of cluster headaches, paroxysmal hemicrania is typically differentiated by the frequency and duration of attacks (WEI DY, et al., 2019).

This condition also presents with autonomic symptoms, but its distinct responsiveness to indomethacin treatment differentiates it. SUNCT, the acronym for Short-Lasting Unilateral Neuralgiform headache with Conjunctival injection and Tearing, is a rare condition but presents a unique diagnostic challenge. It is characterized by very brief, yet severe, episodes of unilateral pain. Patients may experience numerous attacks daily, which can be distressing (POMEROY JL and NAHAS SJ, 2015).

The intricate nature of facial pain disorders, including their myriad presentations and subtypes, often presents significant diagnostic challenges. Trigeminal Neuralgia (TN) is a particularly notable condition within this category, known for its sudden and severe pain reminiscent of electric shocks. This pain is often elicited by routine daily activities such as speaking, chewing, or even a slight touch to the face. For our patient, the symptoms were suggestive of TN, particularly given the localized pain within the V2 and V3 territories of the trigeminal nerve, coupled with the presence of characteristic trigger zones (ARAYA EI, et al., 2020).

Furthermore, while TN predominantly affects older adults, the condition can occasionally present in younger demographics, further complicating the diagnostic process. The variability in TN presentations adds another layer of complexity. While the classical type manifests as sudden, intense pain bursts, an atypical presentation might be characterized by a more consistent, burning pain sensation (FITSIORIS X, et al., 2008). This distinction between primary (idiopathic) TN and secondary TN, possibly resulting from another underlying condition, is also crucial (GAMBETA E, et al., 2020). The MRI findings for our patient, indicating vascular structures in close proximity to the trigeminal nerve, were highly suggestive of TN, potentially pointing to vascular compression as a causal factor. However, a definitive conclusion regarding direct vascular compression necessitates a more in-depth investigation (LECLERCQ D, et al., 2013).

A pivotal aspect solidifying the TN diagnosis was the patient's therapeutic response. The use of Carbamazepine, recognized as a primary treatment for TN, resulted in a marked improvement in the patient's symptoms. This therapeutic response, aligning with documented evidence on the efficacy of Carbamazepine for TN, played an indispensable role in the diagnostic journey, ultimately guiding our clinical conclusion (ARAYA EI, et al., 2020).

In clinical practice, overlapping symptom presentations can be challenging to interpret. Even experienced practitioners might find it challenging to differentiate between these conditions (TESHIMA T, et al., 2023). Therefore, a comprehensive patient history, rigorous symptom evaluation, utilization of diagnostic tools, and monitoring therapeutic responses are paramount. In complex cases, a thorough and iterative diagnostic approach is vital to ensure the optimal care pathway for the patient (MAARBJERG S, et al., 2017).

In conclusion, this case report suggests a potential co-occurrence of fibromyalgia and trigeminal neuralgia in a single patient, which is a relatively rare but possible phenomenon. The presented case highlights the importance of a multidisciplinary approach to managing these complex cases, including imaging and laboratory tests to guide clinical management. Carbamazepine proved effective in reducing the patient's pain and improving her mood, but it required careful dose titration and monitoring for side effects. The case underscores the fundamental role of carbamazepine as an attenuating agent of symptoms despite the initial side effects experienced by the patient. Further research is necessary to better understand the relationship between trigeminal neuralgia and fibromyalgia, as well as to explore the optimal treatment strategies for these patients.

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