Case Report

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Trigeminal Neuralgia with Autonomic Symptoms: A Case Report

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Trigeminal neuralgia (TN), primarily affecting the maxillary nerve and mandibular nerve, manifests as sudden and severe facial pain without autonomic symptoms such as tearing and ptosis. However, rare cases present with such symptoms, which necessitate differentiation from short-lasting unilateral neuralgiform headache attacks with conjunctival injection and tearing (SUNCT)/short-lasting unilateral neuralgiform headache attacks with cranial autonomic symptoms (SUNA), as these disorders share similar pain episodes within the trigeminal sensory territory, often including autonomic manifestations. This study aims to clarify distinguishing features and facilitate accurate diagnosis. We report a 63-year-old female presenting with left upper premolar area pain upon infraorbital, zygoma, and upper lip contact. Her pain history followed re-endodontic and prosthodontic treatment of the left upper second premolar, and examination showed electric-like sensations without spontaneous pain. Treatments included anti-inflammatory medications and occlusal adjustments, which proved ineffective. A tentative diagnosis of TN led to treatment with carbamazepine, oxcarbazepine, and baclofen, noting episodic conjunctival injection and asymmetric tongue sensations during severe attacks. This case, marked by touch-evoked, short-duration pain in the maxillary branch and late-emerging mild autonomic symptoms, responded well to carbamazepine, favoring a TN diagnosis over SUNCT/SUNA. The presence of autonomic symptoms in suspected TN cases necessitates careful reevaluation to distinguish from SUNCT/SUNA, particularly when carbamazepine response is suboptimal. Accurate differentiation is crucial for targeted therapy, as medication efficacy varies significantly between these conditions.

Keywords: Autonomic symptoms; Trigeminal autonomic cephalgia; Trigeminal neuralgia

INTRODUCTION

Trigeminal neuralgia (TN) is a condition characterized by sudden, severe, and intense facial pain occurring in one or more branches of the trigeminal nerve, most commonly affecting the maxillary nerve (V2) or mandibular nerve (V3) [1]. Autonomic symptoms, such as tearing, flushing, facial swelling, eyelid drooping, nasal congestion, pupil changes, eye redness, and sweating, are typically absent in TN. However, these autonomic symptoms are frequently associated with trigeminal autonomic cephalalgias (TACs) such as cluster headache, paroxysmal hemicrania, and short-lasting unilateral neuralgiform headache attacks, which require differentiation from TN [2].

Although autonomic symptoms are usually not present in classical TN, rare cases may exhibit mild autonomic features, including tearing, congestion, flushing, conjunctival injection, and ptosis, especially during severe pain episodes [3]. In such cases, it is crucial to distinguish TN from other conditions like short-lasting unilateral neuralgiform headache attacks with conjunctival injection and tearing (SUNCT) or short-lasting unilateral neuralgiform headache attacks

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with cranial autonomic symptoms (SUNA), which are TACs characterized by brief episodes of facial pain and autonomic involvement [4].

TN typically involves the V2 and V3 of the trigeminal nerve, with pain episodes lasting between 1 to 120 seconds, often followed by a refractory period [5]. In contrast, SUNCT/SUNA usually affect the ophthalmic nerve (V1) and have longer pain durations, ranging from 1 to 600 seconds, without a refractory period [6]. Differentiating between TN and SUNCT/SUNA can be challenging, as some cases of TN exhibit continuous pain, and a substantial number of SUNCT/SUNA episodes are triggered by innocuous stimuli such as brushing teeth or eating, leading to similarities in clinical presentation [7].

In this case, we present the case of a 63-year-old female patient who exhibited unilateral facial pain accompanied by autonomic symptoms, subsequently diagnosed with TN at the Department of Orofacial Pain and Oral Medicine, Yonsei University Dental Hospital. This study was approved by the Institutional Review Board of Yonsei University Dental Hospital (IRB no. 2-2024-0015; approval date: April 17, 2024). The requirement for written informed consent was waived by the committee because of the retrospective nature of the study.

CASE REPORT

A 63 years old female visited the Department of Orofacial Pain and Oral Medicine of Yonsei University Dental Hospital (Seoul, Korea) with a complaint of her left upper premolar area pain when she touches her infraorbital area, zygoma, upper lip. No spontaneous pain, but pain occurred when touching the left cheek or glabella, washing the face, or applying makeup, with a throbbing pain rating of numerical rating scale (NRS) 4 to 8. Pain was exacerbated by fatigue or stress, with no increase in intensity when the head was lowered, or during activities such as walking or running, and no accompanying otolaryngologic symptoms were reported. The patient had no systemic diseases other than hypertension.

Following the completion of re-endodontic retreatment and prosthodontic restoration of tooth #25 four years prior, the patient experienced distinct pain characterized by a shooting, electrifying sensation, triggered upon palpation of the adjacent upper lip and cheek region. Neither anti-inflammatory medication nor subsequent occlusal adjustment alleviated the symptoms. Clinical examination revealed no tenderness or response to palpation in teeth #23, #24, #25, and #26. However, palpation of the left cheek and interdental area elicited an electric-like sensation localized to the interdental region of teeth #23 and #24. Initial panoramic examination revealed no abnormalities in chief complaint area (Fig. 1).

With a tentative diagnosis of TN, the patient's symptoms were consistently alleviated through the combined administration of carbamazepine, oxcarbazepine, gabapentin, and baclofen, briefly described below: carbamazepine, 100-400 mg twice daily or 100-200 mg as needed for severe pain; oxcarbazepine, 100-600 mg twice daily, with adjustments due to hyponatremia and dizziness; gabapentin, 100-600 mg three times daily, primarily used when hyponatremia occurred; and baclofen, 10 mg once or twice daily as an add-on therapy. However, during episodes of severe exacerbation, conjunctival injection in the left eye and asymmetrical sensory perceptions in the tongue were noted.

During the patient's second visit, brain magnetic resonance imaging (MRI) was performed using sagittal T1-weighted imaging (T1WI), axial T1WI, T2-weighted imaging (T2WI), T2 fluid-attenuated inversion recovery (FLAIR), T2*-weighted imaging (T2*WI), and contrast-enhanced three-dimensional T1WI with axial, coronal, and sagittal reconstructions, following the administration of contrast media. The MRI revealed that the left 5th cranial nerve was in contact with the vertebral artery inferiorly and the superior

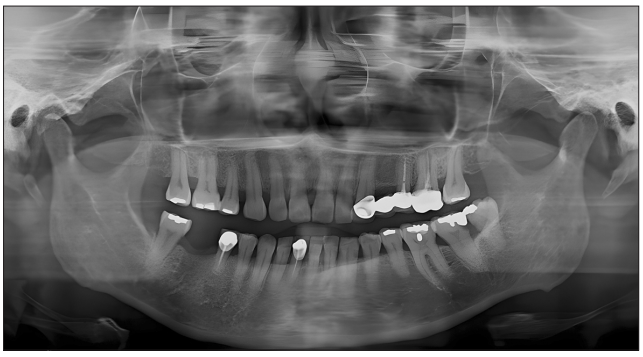

Fig. 1. Panoramic view shows no remarkable findings on left maxillary premolar area.

cerebellar artery superiorly, leading to a diagnosis of idiopathic TN (Fig. 2). While the left trigeminal nerve was in contact with both the vertebral and superior cerebellar arteries, there was no evidence of atrophy or compression, ruling out classical TN. A diagnosis of TN affecting the left V2 of the trigeminal nerve was confirmed after the patient responded favorably to carbamazepine. Additional contributing factors to this diagnosis included the presence of a trigger zone, pain localized to the second branch of the trigeminal nerve, and MRI findings.

DISCUSSION

Since the first documented case of TN with autonomic symptoms in 1914, autonomic involvement has been reported in approximately 31%-67% of cases [8]. Autonomic symptoms are more frequently observed when the V1 is affected, with lacrimation and conjunctival injections being the most common manifestations. In contrast, facial swelling is most commonly associated with the V2, while excessive salivation is typically observed in cases involving the V3 [9].

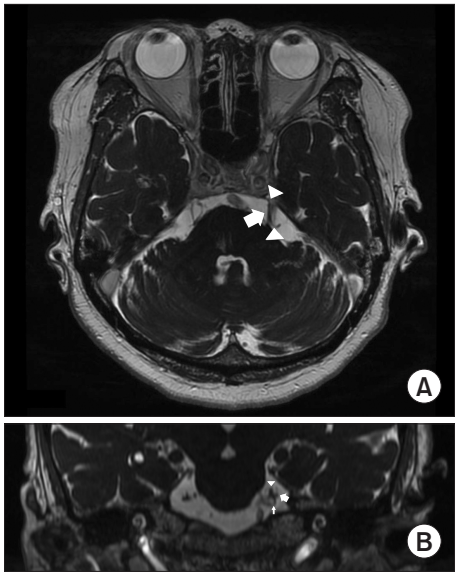

Fig. 2. Brain magnetic resonance imaging with contrast performed during the patient's second visit. (A) Axial view: The left trigeminal nerve (arrow) is seen in contact with the left superior cerebellar artery (SCA; arrowhead). The trigeminal nerve traverses while maintaining its course, and the SCA exhibits a reverse-S-shaped curvature, making contact as it passes by the nerve. (B) Coronal view: The left trigeminal nerve (arrow) is seen in contact with the left SCA (arrowhead) superiorly and the vertebral artery (VA; narrow arrow) inferiorly.

According to the International Classification of Headache Disorders-3 (ICHD-3) diagnostic criteria, SUNCT/SUNA is characterized by moderate to severe unilateral facial pain in the orbital, supraorbital, temporal area or other trigeminal nerve branches that occur as a stabbing pain lasting from 1 to 600 seconds per episode [10,11]. SUNCT/SUNA must be accompanied by at least one autonomic symptom or sign ipsilateral to the area of pain to be diagnosed. SUNCT must be accompanied by both conjunctival injection and lacrimation, while SUNA is diagnosed in the absence of either or both [10].

TN with autonomic symptoms can be clinically challenging to distinguish from SUNCT or SUNA, as these conditions share similar pain patterns, can be triggered by skin irritation, and may respond differently to treatments. Therefore, a careful differential diagnosis is essential in such cases [12].

SUNCT/SUNA is characterized by attacks triggered by innocuous stimuli, such as cutaneous or intraoral touch on the ipsilateral side of the pain, occurring in 56% of patients, with 4% experiencing only triggered attacks. Along with TN, it is one of the few facial pain conditions associated with mechanical triggers, although less prominently than in TN, where trigger-induced pain is a diagnostic criterion. Common triggers, such as cold wind, light touch, chewing, and brushing, suggest shared pathophysiological mechanisms. Key distinctions include the absence of a refractory period in 80%-90% of SUNCT/SUNA cases and the presence of agitated behavior, which is rare in TN [13].

SUNCT/SUNA are typically observed early in the course of disease, whereas TN may develop autonomic symptoms as the condition progresses. SUNCT/SUNA may also be accompanied by autonomic signs such as pupil dilation and ptosis, and they can exhibit varied responses to different medications (Table 1). While SUNCT, SUNA, and TN all respond to similar medications, TN has shown the highest efficacy with carbamazepine, which is effective in approximately 80% of cases. In contrast, SUNCT responds best to gabapentin and topiramate, and SUNA shows the greatest response to gabapentin and lamotrigine. Carbamazepine has shown lower efficacy in SUNCT (39%) and SUNA (20%) compared to its effectiveness in TN [9].

Additionally, functional brain imaging reveals distinct activation patterns in SUNCT, SUNA, and TN. In TACs, hypothalamic activation before symptom onset is linked to autonomic symptoms, with hypothalamic-trigeminal connections causing parasympathetic outflow. In primary SUNCT, the hypothalamus is likely the central generator, while symptomatic SUNCT, as seen in a patient with a brainstem lesion, did not show hypothalamic activation, suggesting different mechanisms. SUNA shows negative activation, highlighting phenotypic differences with SUNCT. TN imaging shows increased activity in multiple brain regions, including the trigeminal nucleus, thalamus, and sensory cortices. As functional MRI becomes more accessible, it may help differentiate these conditions [9].

To summarize the differential diagnosis, SUNCT/SUNA typically involve the V1 and can manifest outside the trigeminal nerve distribution, whereas TN predominantly affects the V2 and V3 and is confined to the trigeminal nerve region. While both conditions present with short-duration pain, episodes in SUNCT/SUNA tend to be relatively longer. SUNCT/SUNA are characterized by spontaneous, non-refractory pain, accompanied by pronounced autonomic symptoms and generally milder pain intensity. In contrast, TN is mostly stimulus-induced, refractory, and associated with more severe pain, typically with minimal autonomic involvement (Table 2).

In cases of short, intense facial pain accompanied by autonomic symptoms, conditions such as TN paroxysmal hemicrania, and SUNCT/SUNA should be considered. When the pain is localized around the eyes, all these conditions must be evaluated, particularly if other facial regions are affected, which may suggest paroxysmal hemicrania. The diagnosis of paroxysmal hemicrania can be confirmed if there is complete pain relief following treatment with indomethacin. If the pain occurs around the eyes and there is a refractory period, TN is diagnosed, and treatment with carbamazepine is indicated. However, if there is no refractory period or it is not reproducible, a trigeminal nerve block may be performed. Pain relief following the block confirms the diagnosis of TN, while a lack of relief suggests SUNCT, in which case treatment with lamotrigine is recommended [14].

In this case, the patient exhibited symptoms localized to the V2 of the trigeminal nerve, marked by brief, intense pain triggered by tactile stimuli. Autonomic symptoms were relatively mild and absent during the early stages of the disease, only becoming apparent later. The presence of a refractory period, along with a positive response to

Table 1. Treatment response of trigeminal neuralgia and SUNCT/SUNA

	Treatment	Dose (mg/day)
Trigeminal neuralgia	Carbamazepine	100–1,200
SUNCT/SUNA	Lamotrigine (SUNA)	100–600
	Gabapentin (SUNCT, SUNA)	1,800–2,400
	Topiramate (SUNCT)	50–500
	Carbamazepine (partial benefit)	100–1,200

SUNCT, short-lasting unilateral neuralgiform headache attacks with conjunctival injection and tearing; SUNA, short-lasting unilateral neuralgiform headache attacks with cranial autonomic symptoms.

Table 2. Differential diagnosis of trigeminal neuralgia and SUNCT/SUNA

	SUNCT, SUNA	Trigeminal neuralgia
Pain location	V1>V2/V3	V2/V3>V1
	Can occur outside the trigeminal sensory territory (back of the head)	Exclusive to the trigeminal sensory territory
Pain duration (s)	1–600 (longer)	1–120
Frequency/day	1–600	Triggerable
Refractory period	Absent	Present
Autonomic symptoms	Intense	Less intense
	Associated with relatively lower pain levels	Associated with increasingly severe pain
Associated neurologic deficits	Miosis and/or ptosis may occur ipsilateral to pain	No clinically evident neurological deficits
Response to treatment	More respond to lamotrigine, gabapentin, topiramate	More response to carbamazepine

SUNCT, short-lasting unilateral neuralgiform headache attacks with conjunctival injection and tearing; SUNA, short-lasting unilateral neuralgiform headache attacks with cranial autonomic symptoms; V1, ophthalmic nerve; V2, maxillary nerve; V3, mandibular nerve.

carbamazepine, further supports the diagnosis of TN.

Differentiating TN from SUNCT or SUNA can be challenging when autonomic symptoms are present, due to overlapping pain characteristics such as short, intense, and singular attacks. Although TN, SUNCT, and SUNA are distinct disorders, activation of the trigeminal nerve serves as a common final pathway, leading to similar clinical presentations. In cases of short-lasting facial pain with autonomic features, a systematic approach is essential. This should include identifying the affected trigeminal branch, assessing the refractory period, and evaluating whether the pain subsides with carbamazepine. Additionally, applying the ICHD-3 criteria alongside clinical features such as patient sex, pain localization, severity, duration, autonomic symptom pattern, refractoriness, and functional brain activation can enhance diagnostic precision and improve treatment outcomes.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article because no new data were created or analyzed in this study.

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AUTHOR CONTRIBUTIONS

Conceptualization: JK, YP. Data curation: JK, YP. Formal analysis: JK, MC, JSK. Funding acquisition: YP. Methodology: JK, YP, JSK. Project administration: YP. Visualization: JK. Writing - original draft: JK. Writing - review & editing: YP, SY, MC, JSK, HJA, JHC.

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