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Case report

Diagnostic Challenges and Management of Non-Odontogenic Toothache: A Case of Unilateral Pansinusitis Mimicking Dental Pain

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Abstract

This case report details the diagnostic challenge and subsequent management of a 38-year-old male patient who presented with severe, sharp, and non-localized pain in the right maxillary distal area. Initially unresponsive to non-steroidal anti-inflammatory drugs and antibiotics, the patient's symptoms deviated from typical odontogenic pain characteristics. Comprehensive dental examinations revealed minimal pathologies, challenging initial assumptions of dental-origin pain. Advanced diagnostic imaging, including Orthopantomography and Cone Beam Computed Tomography (CBCT), was pivotal in identifying unilateral pansinusitis, with notable obstruction in the maxillary, ethmoid, and frontal sinuses. Further microbiological analysis confirmed a *Staphylococcus aureus* and anaerobic infection, refocusing the diagnosis to a non-odontogenic source. The patient underwent a targeted 14-day complex antibiotic regimen, supplemented with local treatments including Nasonex nasal spray and saline nasal irrigations. This integrative approach resulted in marked symptom improvement and was instrumental in the patient's recovery. This case highlights the critical need for thorough evaluation in distinguishing between odontogenic and non-odontogenic sources of orofacial pain, ensuring accurate diagnosis and effective treatment.

Keywords: non-odontogenic toothache, unilateral pansinusitis, orofacial pain, sinusitis-induced toothache

Резюме

Този доклад описва подробно диагностичното предизвикателство и последващото лечение на 38-годишен пациент от мъжки пол, който се появи със силна, остра и нелокализирана болка в дясната дистална област на челюстта. Първоначално неповлияващи се от нестероидни противовъзпалителни лекарства и антибиотици, симптомите на пациента се отклоняват от типичните характеристики на одонтогенна болка. Цялостните стоматологични прегледи разкриха минимални патологии, предизвиквайки първоначалните предположения за болка от зъбен произход. Усъвършенстваната образна диагностика, включително ортопантомография и компютърна томография с конусовидни лъчи (CBCT), беше ключова при идентифицирането на едностранен пансинузит, със забележима обструкция в максиларния, етмоидния и фронталния синус. Допълнителен микробиологичен анализ потвърди Staphylococcus aureus и анаеробна инфекция, пренасочвайки диагнозата към неодонтогенен източник. Пациентът е подложен на целенасочен 14-дневен комплексен антибиотичен режим, допълнен с локално лечение, включително спрей за нос Nasonex и назални иригации с физиологичен разтвор. Този интегративен подход доведе до значително подобрение на симптомите и допринесе за възстановяването на пациента. Този случай подчертава критичната необходимост от задълбочена оценка при разграничаване между одонтогенни и неодонтогенни източници на орофациална болка, осигурявайки точна диагноза и ефективно лечение.

Introduction

The orofacial region, frequently affected by pain, is reported by approximately 22% of the population to be a site of discomfort within a six-month period (Lipton *et al.,* 1993). Toothaches, often characterized by pain or soreness in and around teeth, signify potential inflammation or infection and are

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a predominant type of orofacial pain. Typically, these pains originate from the pulp or nearby periodontal tissues and are classified as "odontogenic toothaches," closely linked to subjective symptoms and identifiable through various clinical tests (Amina and Goguen, 2003; Fricton *et al.,* 1985).

However, the realm of "non-odontogenic toothaches," where pain in teeth and adjoining structures arises from sources other than pulpal and periodontal tissues, presents a significant challenge in dental diagnostics. These pains can stem from diverse causes such as myofascial conditions, neurovascular issues, neuropathic disorders, or complications related to the paranasal sinuses (PNS) (Delcanho and Graff- Radford, 1993; Tzukert*et al.,* 1981). This distinction often poses a conundrum for dental practitioners primarily skilled in identifying and treating dental-origin pain.

In our clinical case, we encountered an early middle-aged male initially presenting with symptoms suggestive of an odontogenic origin. Subsequent thorough investigation revealed the pain to be non-odontogenic, specifically stemming from a sinus infection. The resolution of his toothache following antibiotic and localized treatment underscores the critical need for comprehensive understanding and meticulous assessment of both odontogenic and non-odontogenic toothaches. This includes careful consideration of pain nature, patient history, and detailed clinical and radiographic examination of orofacial structures. (Hansen *et al.,* 2009)

Case report

A 38-year-old male presented to our clinic with a week-long history of severe, sharp, non-localized pain in the right maxillary distal area, exacerbated by positional changes. He self-medicated with non-steroidal anti-inflammatory drugs and Ospamox 1000 mg without significant relief. The patient, a social drinker, non-smoker with minimal dental history, exhibited no general diseases or regular medication intake.

Extraoral examination was unremarkable. Intraorally, minimal calculus, no carious lesions or signs of infection were observed, despite chronic periodontitis indicated by gum recessions. The patient's response to the percussion test was notable, with pain elicited more in the first maxillary molar compared to the second, and no response in the premolars.

An orthopantomography revealed no dental pathologies but showed haziness in the right maxillary sinus and an asymptomatic retention cyst in the left sinus (Fig. 1).

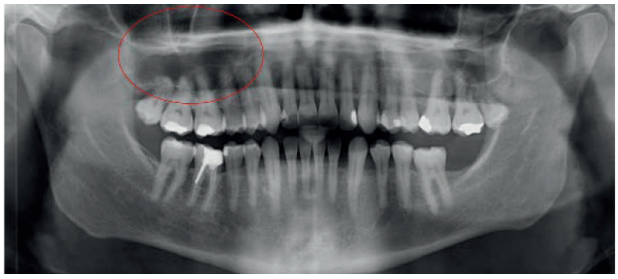

Fig. 1. OPG showing evident haziness in the right maxillary sinus and an asymptomatic retention cyst in the left sinus

Suspecting sinus involvement, a Cone Beam Computed Tomography (CBCT) scan was performed, revealing unilateral pansinusitis with obstruction of the maxillary, ethmoid, and frontal sinuses (Fig. 2). Microbiological examination confirmed *Staphylococcus aureus* infection.

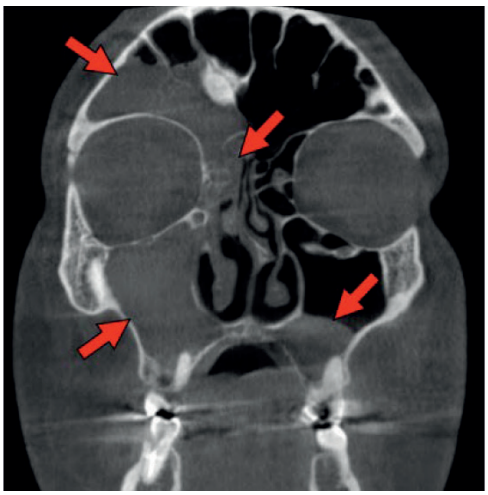

Fig. 2. CBCT scan revealing unilateral pansinusitis with obstruction of the maxillary, ethmoid, and frontal sinuses

The patient underwent a 14-day antibiotic regimen comprising Augmentin 1000 mg thrice daily and Flagyl 500 mg twice daily, with Sequanian probiotics before antibiotic intake. Locally, he was prescribed Nasonex nasal spray (50 mcg mometasone furoate) and instructed to perform isotonic saline nasal irrigations twice daily. This combined therapy aimed to address the infection, maintain gut flora, and facilitate sinus drainage.

One month after initiation of the treatment, the patient reported substantial symptom relief and improved breathing. A foul smell and taste from mucus discharge, indicative of the resolving infection, were noted. A follow-up CBCT scan 2-3 months later showed significant improvement with only a small residual mucus between the frontal and

ethmoid sinuses (Fig. 3), expected to resolve spontaneously.

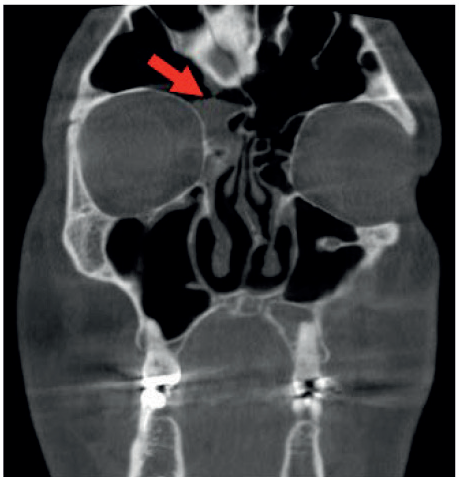

Fig. 3. Follow-up CBCT with evident improvement of the sinusitis. a small residual mucus between the frontal and ethmoid sinuses expected to resolve spontaneously

Discussion

In our clinical case, a 38-year-old male experienced severe, sharp pain in the right maxillary distal area, not alleviated by self-administered non-steroidal anti-inflammatory drugs and antibiotics. This presentation differs from typical odontogenic pain, often characterized by deep, dull, aching sensations originating from the pulp or periodontal tissues, and typically more responsive to such medications (Annino and Goguen, 2003; Ikeda and Suda, 2003). The pain's non-specific location and lack of response to typical interventions suggested a non-odontogenic source, necessitating further investigation beyond conventional dental diagnoses (Okeson, 2000; Okeson and Bell, 2005).

In evaluating orofacial pain, distinguishing between the site of pain and its true source is essential (Okeson and Bell, 2005). The pain, initially perceived within a specific jaw area, led to an exploration of potential referred or heterotopic pain sources, as the patient's discomfort did not align with common odontogenic symptoms. Our patient's case illustrates the complexity of such diagnoses. Investigations into non-odontogenic sources, such as myofascial, neurovascular, cardiac, or sinus issues, are crucial in such scenarios. The prevalence of sinusitis, especially maxillary sinusitis, and its ability to mimic dental pain, necessitates careful consideration in differential diagnoses (Fagnan, 1998; Balasubramaniam *et al.,* 2011). Maxillary sinusitis, characterized by a constant burning sensation around the zygoma and tooth tenderness, can induce referred pain to the maxillary teeth due to anatomical proximity (Brook, 2006). In our case, orthopantomography and CBCT imaging was pivotal in revealing unilateral pansinusitis, underscoring sinusitis as the likely source of pain.

The successful resolution of symptoms following targeted treatment for sinusitis, involving antibiotics and local therapies, further validated the diagnosis. This case highlights the importance of a comprehensive approach in the evaluation of orofacial pain, considering both odontogenic and non-odontogenic sources (Williams *et al.,* 1992).

This case demonstrates the importance of thorough history-taking and physical examination, complemented by relevant radiographic assessment (Williams *et al.,* 1992; Ikeda and Suda, 2003, Balasubramaniam *et al.,* 2011). Such an approach is vital for correctly diagnosing orofacial pain, as misdiagnosis can lead to unnecessary treatments like root canal therapy or tooth extraction. Understanding the nuanced presentation of sinusitis and its referral patterns to dental structures can help clinicians avoid such pitfalls.

In conclusion, our case reinforces the necessity of considering both odontogenic and non-odontogenic sources in orofacial pain diagnosis. Clinicians must be vigilant in their assessments, particularly when initial treatments do not resolve symptoms, to ensure accurate diagnosis and appropriate management.

References

Annino, D. J. Jr., L. A. Goguen (2003). Pain from the oral cavity. *Otolaryngol. Clin. North* **36**: 1127-1135. DOI: 10.1016/S0030-6665(03)00132-4.

Balasubramaniam, R., L. N. Turner, D. Fischer, G. D. Klasser, J. P. Okeson (2011). Non-odontogenic toothache revisited. *Open J. Stomatol.* **1**: 92-102. DOI: 10.4236/ojst.2011.13015.

Brook, I. (2006). Sinusitis of odontogenic origin. *Otolaryngol. Head Neck Surg*. **135**: 349-355. DOI: 10.1016/j.otohns.2005.10.059.

Delcanho, R. E., S. B. Graff-Radford (1993). Chronic paroxysmal hemicrania presenting as toothache. *J. Orofac. Pain* **7**: 300-306. PMID: 9116630.

Fagnan, L. J. (1991). Acute sinusitis: a cost-effective approach to diagnosis and treatment. *Am. Fam. Physician* **58**: 1795-1802. https://www.aafp.org/pubs/afp/issues/1998/1115/p1795.html.

Fricton, J. R., R. Kroening, D. Haley, R. Siegert (1985). Myofascial pain syndrome of the head and neck: a review of clinical characteristics of 164 patients. *Oral Surg. Oral Med. Oral Pathol*. **60**: 615-623. DOI: 10.1016/0030-4220(85)90364-0.

Hansen, J. G., T. Højbjerg, J. Rosborg (2009). Symptoms and signs in culture-proven acute maxillary sinusitis in a general practice population. *APMIS* **117**: 724-729. DOI: 10.1111/j.1600-0463.2009.02526.x.

Ikeda, H., H. Suda (2003). Sensory experiences in relation

to pulpal nerve activation of human teeth in different age groups. *Arch. Oral Biol*. **48**: 835-841. DOI: 10.1016/s0003-9969(03)00176-6.

Lipton, J. A., J. A. Ship, D. Larach-Robinson (1993). Estimated prevalence and distribution of reported orofacial pain in the United States. *J. Am. Dent. Assoc*. **124**: 115-121. DOI: 10.14219/jada.archive.1993.0200.

Okeson, J. P. (2000). Non-odontogenic toothache. *Northwest Dent*. **79**: 37-44.

Okeson, J. P., D. A. Falace (1997). Nonodontogenic toothache. *Dent. Clin. North Am*. **41**: 367-383. https://doi.org/10.1016/S0011-8532(22)00091-X.

Okeson, J. P., W. E. Bell (2005). Bell's orofacial pains: the clinical management of orofacial pain. 6th ed. Chicago: Quintessence; pp. 64-67. DOI: 10.1093/ejo/cji087

Tzukert, A., Y. Hasin, Y. Sharav (1981). Orofacial pain of cardiac origin. *Oral Surg. Oral Med. Oral Pathol*. **51**: 484-486. https://doi.org/10.1016/0030-4220(81)90006-2.

Williams, J. W. Jr., D. L. Simel, L. Roberts, G. P. Samsa (1992). Clinical evaluation for sinusitis: Making the diagnosis by history and physical examination. *Ann. Intern. Med*. **117**: 705-710. DOI: 10.7326/0003-4819-117-9-705.