

Odontogenic maxillary sinusitis obscured by midfacial trauma

Regimantas Simuntis, Ričardas Kubilius, Silvija Ryškienė, Saulius Vaitkus

SUMMARY

We present a case of odontogenic maxillary sinusitis whose sinonasal symptomatology was thought to be the consequence of a previous midfacial trauma. The patient was admitted to the Clinic of Oral and Maxillofacial Surgery after more than 10 years of exacerbations of sinonasal symptoms, which began to plague soon after a facial contusion. We decided to perform CT of paranasal sinuses, and despite the absence dental symptomatology, the dental origin of sinusitis was discovered. The majority of sinonasal symptoms resolved after appropriate dental treatment, and there was no need for nasal or sinus surgery

Key words: odontogenic maxillary sinusitis, midfacial trauma.

INTRODUCTION

Historically, odontogenic etiology accounts for 10% to 12% of cases of maxillary sinusitis. (1-3) It occurs when the sinus membrane is damaged by conditions such as infections of the maxillary posterior teeth, pathologic lesions of the jaws, maxillary (dental) trauma, or by iatrogenic causes such as complications of dental or implant surgery or maxillofacial surgery. (1, 2, 4) If untreated, it may complicate to orbital cellulitis, a post-septal abscess, or even a cerebral abscess. (5) The treatment options depend on many factors and vary from conservative to surgical, and there is still no gold standard. The effectiveness of conservative treatment depends on early diagnostics of the dental origin of the problem.

We present a case of severe OMS whose sinonasal symptoms were for many years mistakenly considered to be the result of previous midfacial trauma.

¹Department of Oral and Maxillofacial Surgery, Medical Academy, Lithuanian University of Health Sciences, Lithuania

²Department of Radiology, Medical Academy, Lithuanian University of Health Sciences, Lithuania

³Department of Otorhinolaryngology, Medical Academy, Lithuanian University of Health Sciences, Lithuania

Regimantas Simuntis¹ – D.D.S., doctoral student
Ričardas Kubilius¹ – D.D.S., Dr. hab. med., prof.
Silvija Ryškienė² – Ph.D., assist. prof.
Saulius Vaitkus³ – Ph.D., assoc. prof.

Address correspondence to R. Simuntis, Department of Oral and Maxillofacial Surgery, Medical Academy, Lithuanian University of Health Sciences, Eivenių 2, 50028 Kaunas, Lithuania.
 E-mail address: rsimuntis@yahoo.com

CASE REPORT

A 32-year-old Lithuanian man arrived to the Department of Oral and Maxillofacial Surgery, Hospital of Lithuanian University of Health Sciences, reporting exacerbated dull pain of the left side of the maxilla, postnasal drip, nasal congestion, and bad taste and odor for the last 3 months. He was sent by his general practitioner when the prescribed antibacterial treatment gave no positive response. A thorough anamnesis was collected, which revealed left mid-facial trauma 12 years ago. The patient did not apply for medical assistance at that time. Soon after the trauma, sinonasal symptoms (unilateral nasal discharge, congestion, and bad odor) emerged and exacerbated over the next year. Two years after incident, the patient was referred to an ENT specialist in his local policlinic. Surgical treatment of nasal septum deviation was recommended, but the patient refused it. In later years, there were many exacerbation periods, which resolved with antibacterial and mucus-dissolving treatment. Three months ago, in the dental office, after local anesthesia of tooth #25, sinonasal symptoms exacerbated again, and no antibacterial treatment or mucus-dissolving treatment was effective.

During clinical extraoral examination, asymmetry of the face was noticed. The left anterior maxillary wall was depressed. Also, a nasal deformation was seen. The patient had no complaints concerning his maxillary teeth. Intraorally, the bite was orthognatic, and the patient experienced no pain during the

percussion of all maxillary teeth and palpation of the alveolar process. No caries was discovered, and teeth #24-28 had dental fillings. A panoramic radiograph was performed, which revealed a horizontal generalized bone resorption in both the maxilla and the mandible, being somewhat greater around tooth #27 (Fig. 1). The vitality of all maxillary left teeth was checked



Fig. 1. Panoramic radiograph: horizontal and vertical bone resorption in both jaws, with slightly bigger arround #27 tooth. The hyperostosis of left maxillary lateral wall

using the cold test, and all teeth responded positively. Following that, a periodontal assessment was carried out using a periodontal probe. The pocket depth ranged from 2 to 4 mm in all teeth except for the distal-palatal corner of tooth #27, where it suddenly increased to more than 10 mm. To evaluate the extent of the tooth-sinus pathology, a CT scan was performed, which revealed the absence of the anterior left maxillary wall, hyperostosis of the lateral wall, complete opacification of the sinus cavity, blockage of the ostiomeatal complex, and a large inferior wall bone resorption in the region of tooth #27 (Fig. 2, 3).

A decision was made to extract tooth #27. The alveolus was debrided, revealing the communication with the sinus cavity at the bottom. A natural clot formed, and no further surgical action was taken. After 2 weeks, the patient felt a significant improvement in sinonasal symptoms. The valuation of sinonasal symptoms was made using Snot-22 (Sinonasal Outcome Test), and the result was 13 (compared to 37 preoperatively). Over the next 3 months, the symptoms decreased gradually with no further treatment, and Snot-22 score dropped to 8. 6 months later paranasal sinus CT was repeated and showed almost complete shrinkage of sinus mucosa (Fig. 4).

DISCUSSION

Odontogenic maxillary sinusitis (OMS) is the result of the passage of the oral cavity bacteria into the maxillary sinus. Intimate anatomical relation of the upper teeth to the maxillary sinus promotes the spread of periapical or periodontal odontogenic infection into it. The bony wall separating the maxillary sinus from the roots of the teeth varies from the thickness of 12 mm to its complete absence – i.

e. when the roots are covered only by a mucous membrane (6).

The most common causes of OMS are iatrogenic (55. 97%), periodontitis (40. 38%), and odontogenic cysts (6. 66%) (7).

The pathophysiology, microbiology, and treatment of OMS differ from other forms of maxillary sinusitis, and therefore failure to accurately identify the dental cause in these patients usually leads to persistent symptomatology and failure of medical and surgical therapies oriented toward sinusitis.

Common symptoms suggestive of an odontogenic source can include sinonasal symptoms such as unilateral nasal obstruction, rhinorrhea, and/or foul odor and taste; meanwhile, dental symptoms such as pain or dental hypersensitivity do not reliably predict an odontogenic cause, and are found only in 29% of cases (3, 9).

Radiological imaging provides useful information in the diagnostics of sinusitis – particularly whether an odontogenic source may be responsible for the infection. Panoramic and dental radiography is performed in every dental office. However, dental radiographs have been shown to have an estimated sensitivity of 60% for caries, and approximately 85% for periodontal disease, leaving a high rate of false-negative results (9). CT is the gold standard in the diagnostics of a maxillary sinus disease due to its high resolution, the ability to discern bone and soft tissue, and 95% sensitivity to periapical pathology (9). Cone beam CT is a relatively new tool which utilizes approximately 10% of the radiation dose of conventional thin-slice CT, and is able to produce highly detailed images of the bony tissue (10).

Concomitant management of the dental origin and the associated sinusitis will ensure complete resolution of the infection. Sometimes the elimina-



Fig. 2. Axial view of paranasal sinuses CT: left maxillary sinus is filled with inflammatory tissue, lateral wall is hyperostosed and anterior sinus wall is absent



Fig. 3. Coronal view of paranasal sinuses CT: left maxillary sinus is filled with inflammatory tissue, lateral wall is hyperostosed and left sinus ostium is blocked



Fig. 4. Coronal view of paranasal sinuses CT (six months later): the inflammatory mucosa of left sinus had shrunk to almost normal level

tion of the dental cause is sufficient to treat sinusitis, while in other cases, endoscopic sinus surgery (ESS) or Caldwell-Luc approach is necessary.

The presented case manifested with most commonly occurring sinonasal complains of OMS (bad odor, nasal discharge, and unilateral disease). The significant delay in identifying the dental cause occurred because of many aggravating circumstances, the main being a deviated nasal septum caused by midfacial trauma. Another complicating circumstance was the complete absence of dental symptoms, although they are not always common. Also, during intraoral clinical examination, the percussion of the teeth and the palpation of the alveolar ridge produced no pain, the texture and color of the soft tissues were normal, no gingival recession or tooth mobility was observed, and all teeth positively responded to the cold test, indicating a viable dental pulp tissue. This explains why dental pathology was not detected by the dentists for such a long time.

The periodontal probe was used to measure the periodontal pocket depth, which revealed a deeper than 10 mm pocket in the disto-palatal corner of tooth #27. It was an indication to perform a CT of the paranasal sinuses, which easily confirmed the diagnosis of OMS suspected after the clinical examination.

The CT revealed massive sinus floor bone destruction around tooth #27. The panoramic radiograph failed to exhibit this destruction because of the hyperostosis of the lateral sinus wall caused by trauma. Another interesting factor was the positive pulp response to the cold test because in the CT image, bone destruction involved the whole palatal root with the apex and the trifurcation, with

only the buccal roots having contact with the bone.

The cause of the isolated >10 mm periodontal pocket remains obscure. It could be explained by the mastication mostly with the left side. It is hardly believable that it could develop as a consequence of trauma, because the adjacent teeth were not affected.

Another question is about the beginning of OMS. The massive destruction of the sinus floor suggests it being an old process. The sustained midfacial trauma could have exacerbated pre-existing OMS.

The treatment of sinusitis by extracting the tooth was successful, despite the disease having persisted for years. The nearly complete resolution of sinonasal symptoms suggests that further surgical treatment is not required.

CONCLUSIONS

Regardless of long delay in identifying dental cause, this time OMS responded well to conservative treatment. Not every OMS respond well to such type of treatment, and in delayed cases surgical approach is necessary which in many occasions is detrimental to sinus physiology. Despite ESS technique has gained popularity in chronic rhinosinusitis treatment for the last decades, external approach using Caldwell-Luc technique is still widely used in OMS treatment. Therefore, it is very important to diagnose OMS as early as possible, to prevent surgical interventions of maxillary sinus.

STATEMENT OF CONFLICT OF INTEREST

The authors state no conflict of interest.

REFERENCES

1. Mehra P, Jeong D. Maxillary sinusitis of odontogenic origin. *Curr Allergy Asthma Rep* 2009;9(3):238-243.
2. Brook I. Sinusitis of odontogenic origin. *Otolaryngol Head Neck Surg* 2006;135(3):349-355.
3. Longhini AB, Ferguson BJ. Clinical aspects of odontogenic maxillary sinusitis: a case series. *Int Forum Allergy Rhinol* 2011;1(5):409-415.
4. Brandsted R, Sindwani R. Impact of depression on disease-specific symptoms and quality of life in patients with chronic rhinosinusitis. *Am J Rhinol* 2007;21(1):50-4.
5. Onișor-Gligor F, Lung T, Pintea B, Mureșan O, Pop PB, Juncar M. Maxillary odontogenic sinusitis, complicated with cerebral abscess--case report. *Chirurgia (Bucur)* 2012;107(2):256-9.
6. Ugincius P, Kubilius R, Gervickas A, Vaitkus S. Chronic odontogenic maxillary sinusitis. *Stomatologija* 2006;8(2):44-8.
7. Arias-Irimia O, Barona-Dorado C, Santos-Marino JA, Martinez-Rodriguez N, Martinez-Gonzalez JM. Meta-analysis of the etiology of odontogenic maxillary sinusitis. *Med Oral Patol Oral Cir Bucal* 2010 1;15(1):e70-3.
8. Legert KG, Zimmerman M, Stierna P. Sinusitis of odontogenic origin: pathophysiological implications of early treatment. *Acta Otolaryngol* 2004;124:655-663.
9. Patel NA, Ferguson BJ. Odontogenic sinusitis: an ancient but under-appreciated cause of maxillary sinusitis. *Curr Opin Otolaryngol Head Neck Surg* 2012;20(1):24-8.
10. Nair UP, Nair MK. Maxillary sinusitis of odontogenic origin: cone-beam volumetric computerized tomography-aided diagnosis. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2010;110(6):e53-7.

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