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Case Report

Odontogenic Sinusitis – Case Report

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Abstract: This case report aims to highlight the diagnostic and therapeutic approach for odontogenic sinusitis resulting from dental extraction. Odontogenic sinusitis is an inflammatory condition of the paranasal sinuses caused by dental disorders such as periapical infections, iatrogenic perforations, and maxillary fractures. It accounts for up to 30-40% of cases of chronic maxillary sinusitis. However, many cases are misdiagnosed, underscoring the importance of correctly identifying the cause to avoid inappropriate treatments. This case emphasizes the importance of an accurate diagnosis and multidisciplinary treatment in the management of odontogenic sinusitis. From the identification of odontological infectious disorders, mainly of the upper molars and premolars, to meticulous surgical, endodontic, and implant planning. An important factor in the diagnosis of acute odontogenic sinusitis is recent tooth extraction or implants where clinical bucco-sinusal communication or pain is observed in the first days after the procedure. Early identification and appropriate intervention are essential to prevent additional complications and ensure full recovery. The findings advocate for meticulous postoperative follow-up and the need for integrated care involving specialists in dentistry and otolaryngology.

Keywords: Oral Surgery; Bucco-Sinusal Communication; Extraction.

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1. Introduction

Odontogenic sinusitis is an inflammatory condition of the paranasal sinuses caused by dental disorders such as periapical infections, iatrogenic perforations, and maxillary fractures. It accounts for up to 30-40% of cases of chronic maxillary sinusitis. However, many cases are misdiagnosed, underscoring the importance of correctly identifying the cause to avoid inappropriate treatments [1-3].

This case highlights the importance of an accurate diagnosis and multidisciplinary treatment in the management of odontogenic sinusitis. From the identification of odontological infectious disorders, particularly of the upper molars and premolars, to meticulous surgical, endodontic, and implant planning. An important factor in the diagnosis of acute odontogenic sinusitis is recent tooth extraction or implants where clinical bucco-sinusal communication or pain is observed in the first days after the procedure. Early identification and appropriate intervention are essential to prevent additional complications and ensure full recovery. The findings advocate for meticulous postoperative follow-up and the need for integrated care involving specialists in dentistry and otolaryngology.

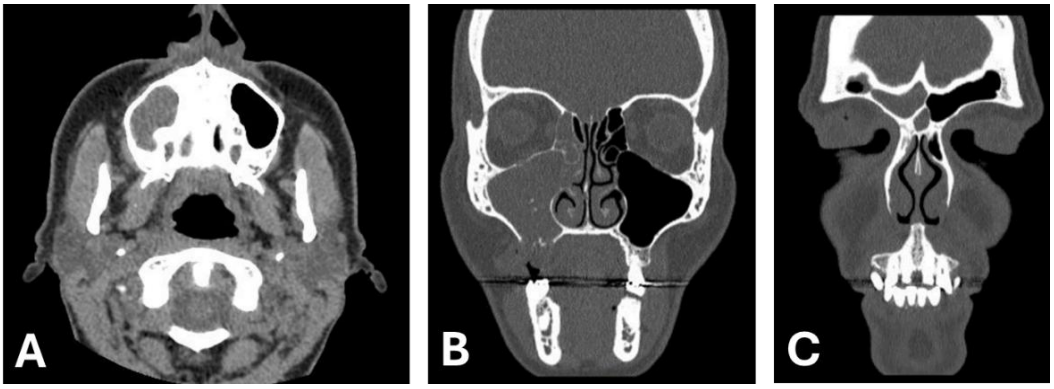
2. Case Report

A female patient, 48 years and 9 months old. She arrives at the clinic complaining of pain in the area where an upper molar was extracted 21 days ago. In her history, she reports that after the extraction of the upper tooth, pain started at the site and on the right side of the face. She returned to the dentist who applied for a dressing and prescribed amoxicillin and an anti-inflammatory. The pain reduced and a bad smell began to come out of the nose, and the facial pain worsened, especially when she lowered her

head. In her personal history, she reports an infection in her right eye two months ago, thrombophilia, removal of the uterus two years ago, denies smoking and alcoholism. In her personal history, she reported relatives with heart disease and circulation disorders. On extrabuccal physical examination, a strong odor was noticed coming from the right nostril. On intrabuccal physical examination, the absence of tooth 16, an open alveolus, and the drainage of secretion suggesting bucco-sinusal communication were observed. The diagnostic hypothesis was odontogenic sinusitis on the right side with bucco-sinusal communication in the region of tooth 16. A complete blood count and facial tomography were requested.

The computed tomography scan confirmed the clinical diagnosis with the following description: Complete densification of the right maxillary sinus exhibiting calcification within. There is a noted disruption in the alveolar recess of the right maxillary sinus with extensive communication between the oral cavity and the right maxillary sinus (figure 1 – A, B and C). The patient underwent surgical treatment by the otolaryngology team under general anesthesia. At the last consultation, a reduction in symptoms was observed, however, with little nasal secretion and mild pain at the extraction site. No fistula was observed in the extraction area.

Figure 1: A. Axial section of the maxilla showing complete densification of the right maxillary sinus. B. Frontal section of the maxilla showing total opacification of the right maxillary sinus with communication to the nasal cavity. C. Frontal section of the face showing opacification of the right frontal sinus.



3. Discussion

Several dental conditions are associated with the development of odontogenic sinusitis. Sinusitis is the inflammation of the maxillary sinus, which can be acute (less than 12 weeks) or chronic (more than 12 weeks). The main cause is respiratory, but dental problems can also cause unilateral maxillary sinusitis due to the proximity of the teeth to the maxillary sinus, allowing dental infections to reach the sinus cavity through the Schneiderian membrane. It is estimated that conditions such as periodontitis, abscesses, and dental trauma are associated with up to 30% of cases of maxillary sinusitis [1]. The removal of implants is recommended in suspected cases of peri-implant osteitis or when the osteointegration of implants is uncertain, reducing the risk of recurrent sinusitis [1].

Cone beam computed tomography (CBCT) is recommended for a detailed analysis of the maxillary sinus and its relationship with the teeth, especially in cases of persistent chronic sinusitis. Examinations of the airways and teeth should be performed in cases where odontogenic lesions are suspected that may be related to sinusitis or may trigger it. The clinical presentation of odontogenic maxillary sinusitis (OMS) is variable and non-specific, but if untreated, it can lead to serious complications and affect quality of life. The diagnosis of OMS involves a detailed assessment of symptoms, physical examination, and intraoral and extraoral radiographic imaging [2]. Intranasal examinations, such as

anterior rhino-pharyngoscopy or flexible naso-laryngoscopy, can complement the evaluation [3]. Triggering factors include caries, periodontal disease, iatrogenic causes, oroantral fistula, and dental cysts [2].

The incidence of OMS has been increasing due to the rise in endoscopic sinus surgery, often revealing previously undiagnosed underlying dental pathology. Inspections of the oral mucosa and vestibule, pulp vitality tests, percussion, and palpation are essential. For patients with endodontic treatment, it is important to check the integrity of dental restorations. In addition, the extrusion of dental materials used during root canal treatment into the maxillary sinus presents a high risk of causing odontogenic sinusitis. In less common cases, dentigerous cysts associated with displaced maxillary molars or impacted third molars in the maxillary sinus can also manifest as odontogenic sinusitis. These cysts can cause bone thinning due to pressure and, if untreated, can expand into the maxillary sinus [3].

Therefore, radiological examination is crucial in the diagnosis of OMS, revealing lesions such as periapical osteitis, periradicular osteitis, and thickening of the maxillary sinus mucosa. These lesions may indicate apical periodontitis, periodontal disease, and maxillary sinusitis of odontogenic origin. The infection can reach the dental apex in various ways. Deep caries can lead to pulpitis and periapical infections, while severe periodontal disease can result in secondary endodontic lesions. The contact of the infectious process with the Schneiderian membrane can cause inflammation, hypertrophy, and rupture, releasing pro-inflammatory factors that lead to edema, fibrosis, and cystic degeneration [4].

The infectious dental pathology can have an acute phase, with the direct propagation of bacteria and a hypertrophic response of the Schneiderian membrane, and a chronic phase, characterized by an adaptive immune response. These changes occur even with a bony wall separating the tooth apex from the sinus floor [4]. Surgical maneuvers are considered the main triggering factor of odontogenic sinusitis in 64% of cases, followed by infectious causes and periapical pathology [4]. The treatment of odontogenic sinusitis involves various procedures as we will see next. In a study conducted by Molteni et al. 2019, all patients diagnosed with odontogenic sinusitis underwent surgery and were discharged the following day. After surgery, antibiotic therapy was recommended, such as levofloxacin 500 mg for 10 days, and nasal washes with saline solution three times a day for 30 days. Topical creams of antibiotics and steroids, as well as oral rinses such as 0.2% chlorhexidine, were recommended to maintain oral hygiene. Treatment success was defined as the absence of endoscopic signs of sinusitis and the resolution of symptoms [1].

The treatment of OMS is complex, involving medications, dental treatment, and surgical measures [4]. The bacteria involved in the development of bacterial sinusitis are numerous and varied. Bacterial and fungal species such as Streptococcus, Propionibacterium, and Candida albicans can cause secondary periapical lesions. More than 158 bacterial species and 3 fungal species may be involved, with Enterococcus faecalis being the most common. Periapical lesions related to odontogenic sinusitis present biofilm granules associated with granulomatous lesions. The bacterial biofilm hypothesis suggests dynamic bacterial communities in an extracellular matrix, leading to persistent chronic infections [5]. These biofilms consist of dynamic communities of bacteria with a matrix rich in exopolysaccharides, proteins, and nucleic acids, contributing to their persistence and resistance [4]. Odontogenic sinusitis can be acute or chronic. These infections are usually unilateral and underestimated and underdiagnosed.

An infection that develops rapidly and spreads acutely has a more devastating impact than a slow inflammation, potentially affecting the maxillary sinus in a short time. The spread of bacteria can trigger a hypertrophic inflammatory response in the Schneiderian membrane. If endodontic treatment fails and microorganisms persist, secondary periapical lesions may form. Odontogenic sinusitis (OMS), recognized by dentists and otolaryngologists, accounts for about 30% of cases of unilateral maxillary sinusitis. If not

identified, it can lead to persistent cases of sinusitis with serious complications [3]. This is an underestimated and underdiagnosed condition, accounting for 75% of cases of unilateral maxillary sinusitis. It generally affects people between 40 and 60 years of age, with a slight predominance in women, presenting symptoms such as nasal obstruction, facial pain, and reduced sense of smell for more than 12 weeks [4].

4. Conclusion

The occurrence of odontogenic sinusitis is not rare, and several authors agree that it can be prevented with dental and otolaryngological examinations and treatment of dental causes. The extraction of upper molars and premolars with periapical lesions or the exposure of the maxillary sinus itself during surgery are the main causes of acute odontogenic sinusitis or the exacerbation of a pre-existing lesion.

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Supplementary Materials: None.

References

1. Molteni M, Bulfamante AM, Pipolo C, Lozza P, Allevi F, Pisani A, Chiapasco M, Portaleone SM, Scotti A, Maccari A, Borloni R, Felisati G, Saibene AM. Odontogenic sinusitis and sinonasal complications of dental treatments: a retrospective case series of 480 patients with critical assessment of the current classification. Acta Otorhinolaryngol Ital. 2020 Aug;40(4):282-289. doi: 10.14639/0392-100X-N0457.
2. Premoli Maciel, Aloizio, Albano Lopes, Ivna, Adami Tucunduva, Rosana Mara, Simpione, Guilherme, da Silva Santos, Paulo Sérgio, Damante, José Humberto, & Alvares Capelozza, Ana Lúcia. (2020). Contribution of the CBCT in the diagnosis and treatment plan of odontogenic maxillary sinusitis: Cases Reports. Revista Estomatológica Herediana, 30(1), 47-52. https://dx.doi.org/10.20453/reh.v30i1.3740.
3. Psillas G, Papaioannou D, Petsali S, Dimas GG, Constantinidis J. Odontogenic maxillary sinusitis: A comprehensive review. J Dent Sci. 2021 Jan;16(1):474-481. doi: 10.1016/j.jds.2020.08.001.
4. Martu C, Martu MA, Maftei GA, Diaconu-Popa DA, Radulescu L. Odontogenic Sinusitis: From Diagnosis to Treatment Possibilities-A Narrative Review of Recent Data. Diagnostics (Basel). 2022 Jun 30;12(7):1600. doi: 10.3390/diagnostics12071600.
5. Kim SM. Definition and management of odontogenic maxillary sinusitis. Maxillofac Plast Reconstr Surg. 2019 Mar 29;41(1):13. doi: 10.1186/s40902-019-0196-2.