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Maxillary Sinusitis of Odontogenic origin : A case report with CBCT evaluation and review of literature

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Abstract: *Maxillary sinusitis of odontogenic origin is a rare clinical entity and often requires a special consideration, because of the complexity in the microbiological and pathophysiological characteristics of this disease. More often it is misdiagnosed as rhinogenous maxillary sinusitis which leads to failure of treatment. Maxillofacial CBCT is an excellent radiographic technique for diagnosis of odontogenic sinusitis. We present a case of forty three years old male patient who reported with chief complaint of chronic pain on right side of face since 4 months.*

Key Words: *Maxillary sinus, Maxillary sinusitis, Odontogenic origin.*

1. INTRODUCTION:

The origin of maxillary sinusitis is considered to be primarily rhinogenous. Although in some cases, a dental infection is a major predisposing factor.[1] The incidence of odontogenic sinusitis accounts for about 10% of all cases presenting with maxillary sinusitis. Odontogenic sinusitis occurs when the Schneidarian membrane is perforated.[2] This usually occurs due to carious maxillary teeth, dental trauma and iatrogenic causes such as placement of dental implants and dental extractions.[3]

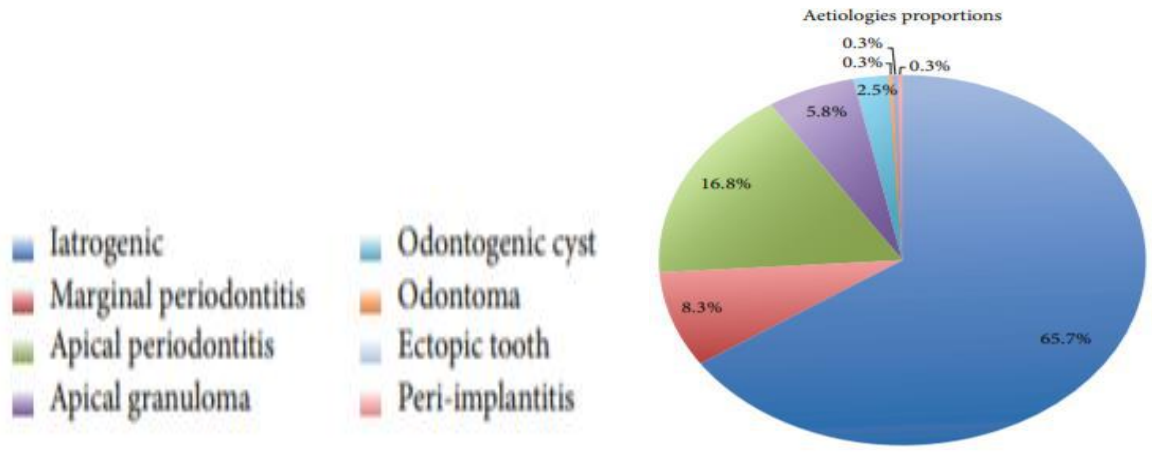

Figure 1: Pie diagram showing percentage distribution of various etiological agents for maxillary sinusitis (Courtesy: Jerome R. Lechien et al)[4]

Odontogenic sinusitis deserves special consideration because it differs in microbiology, pathophysiology, and management compared to sinus diseases with other origins. Thus, many a times the condition is often misdiagnosed and may lead to failure of the treatment.

2. CASE REPORT:

A 43-year-old male patient reported to Outpatient Department of Oral Medicine and Radiology with a chief complain of pain on right side of face and upper right posterior tooth since four months. Pain was continuos and dull aching in nature which aggravated on mastication and had no relieving factors. Patient also gave history of unilateral nasal discharge, and swelling below the lower right eyelid occasionally since 3 months. No medications were taken for the same. On general examination all vital parameters were within normal limits. On extraoral inspection, face was almost bilaterally symmetrical except edema of right lower eyelid (Fig 2). On palpation tenderness was present over right infraorbital rim and maxillary sinus region. A single submandibular lymph node was palpable of size 3*4mm which was tender, mobile and firm in consistency.

Figure 2: Showing bilaterally symmetrical face except oedema of right lower eyelid

The Interincisal mouth opening was 36mm. On intraoral soft tissue examination, there was deep buccal periodontal pocket and bleeding on probing with 16. Hard tissue examination revealed furcation involvement with Grade II mobility and moderate to severe bone loss with 16.Tenderness was positive with 16 on horizontal percussion. Considering the long duration of history, chief complaint of the patient and clinical features, the provisional diagnosis as Maxillary sinusitis of Odontogenic origin was made. Patient was advised for Orthopantamogram(OPG) and Paranasal Sinus(PNS) radiographs. OPG revealed haziness in the right maxillary sinus and resorption of inferior wall of maxillary sinus in 15,16 region. It showed severe interdental bone loss between 16 & 17. It also showed moderate alveolar bone loss with 16 and periapical rarefaction with 15 &16 (Fig 3). PNS radiograph showed mucosal thickening and complete haziness in the right maxillary sinus (Fig 4).

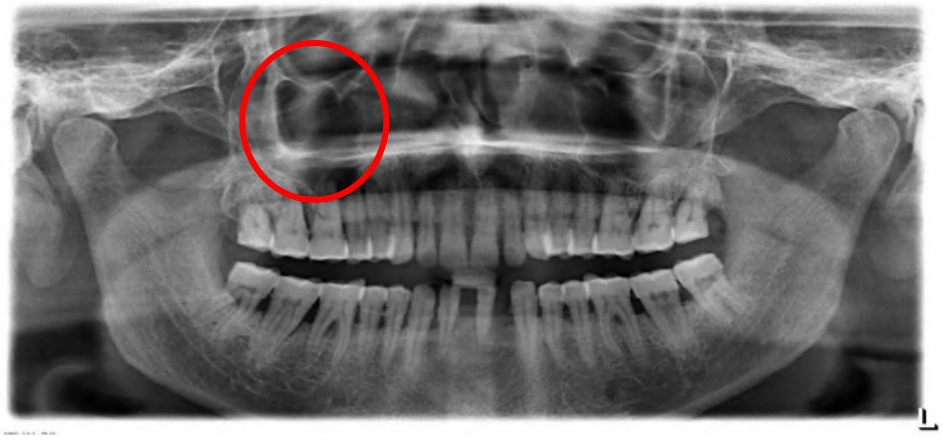

Figure 3: OPG showing haziness in the right maxillary sinus and moderate to severe bone loss and periapical rarefaction with 15 and 16 and thinning of floor of sinus

Figure 4: PNS showing complete haziness in the right maxillary sinus.

Therefore the patient was advised CBCT It revealed a large periapical radiolucency with 15, 16 of size 11.4mm*10.6mm suggestive of periapical rarefying osteitis (Fig 5a and 5b).

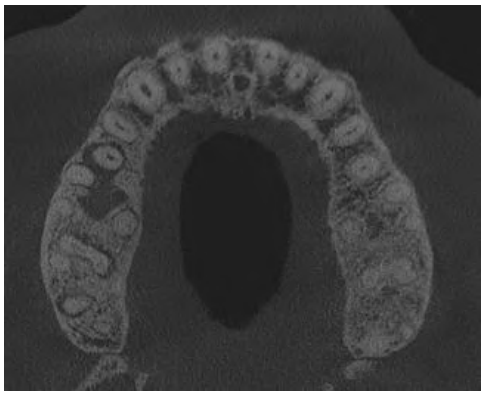

Figure 5a

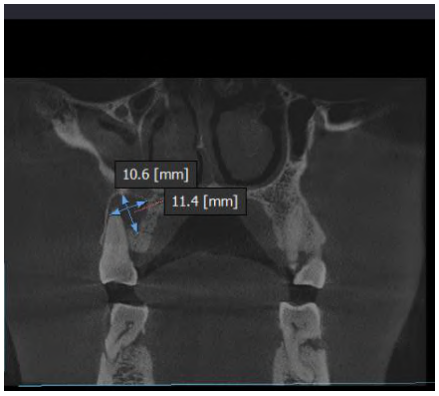

Figure 5b

Figure 5a. (axial view) and 5b(coronal view): CBCT showing periapical radiolucency with15 and 16 of size 11.4 mm*10.6mm.

CBCT also showed dilaceration with mesial root of 17and inflammatory hyperplasia of the sinus lining.(Fig 6a and 6b)

Figure 6a

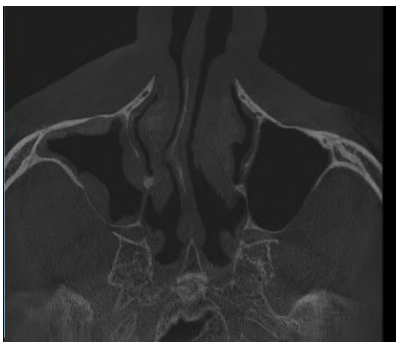

Figure 6b

Figure 6a. (coronal view) and 6b(axial view): CBCT showing dilacerations with 17 along with inflammatory hyperplasia of the sinus lining.

There is perforation of the buccal cortical plate in the periapical region above 15 & 16.(Fig 7a & 7b)

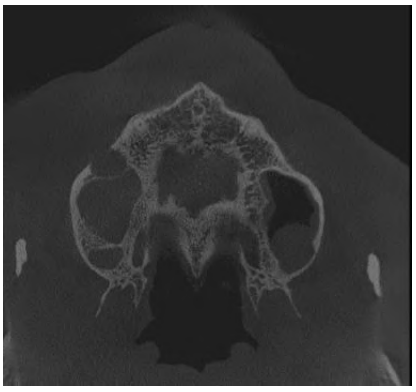

Figure 7a

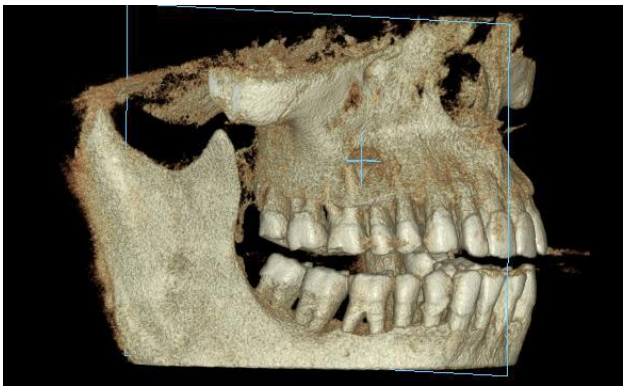

Figure 7b

Figure 7a & 7b showing perforation of buccal cortical plate on axial view and 3D reconstruction imaging.

There is thinning of the floor of the maxillary sinus in the periapical region of 15 & 16 with discontinuity at places. (Fig 8)

Figure 8: Saggital view showing thinning of floor of right maxillary sinus

Thus after radiological evaluation, final diagnosis was confirmed as right maxillary sinusitis of odontogenic origin with deviated nasal septum. As per Abraham & Glassberg [5] modified classification, odontogenic maxillary sinusitis in the present case is diagnosed as lesion class III.

3. MANAGEMENT:

Patient was prescribed Amoxclav 625mg bid *5 days, Metronidazole 400 mg tid*5 days, Xylometazoline HCl (0.5% w/v) as nasal decongestant and steam inhalation bid*7 days. The patient was recalled after 7 days, all the signs and symptoms were resolved then. Further Patient was then referred to Department of Endodontics for root canal therapy & then to Department of Periodontology for flap surgery with bone augmentation. After root canal therapy,flap surgery with bone augmentation was done. Patient was completely relieved of maxillary sinusitis.

4. DISCUSSION:

Maxillary sinusitis avid to odontogenic origin is often overlooked. But due clinical examination and investigations must be done to rule out maxillary sinusitis of dental origin especially in cases of unilateral sinusitis. Maxillary premolar and molar teeth are separated from the sinus floor by a dense cortical bone with a variable thickness, but sometimes they are separated only by the mucoperiosteum and more often the palatal roots of these teeth when infected are the cause of sinusitis.[6] According to Abraham & Glassberg [5] modified classification, sinusitis of odontogenic origin is classified as sinusitis. Lesion class I to III and sinusitis of undetermined origin as sinusitis apex class I to III as shown in Fig 9.

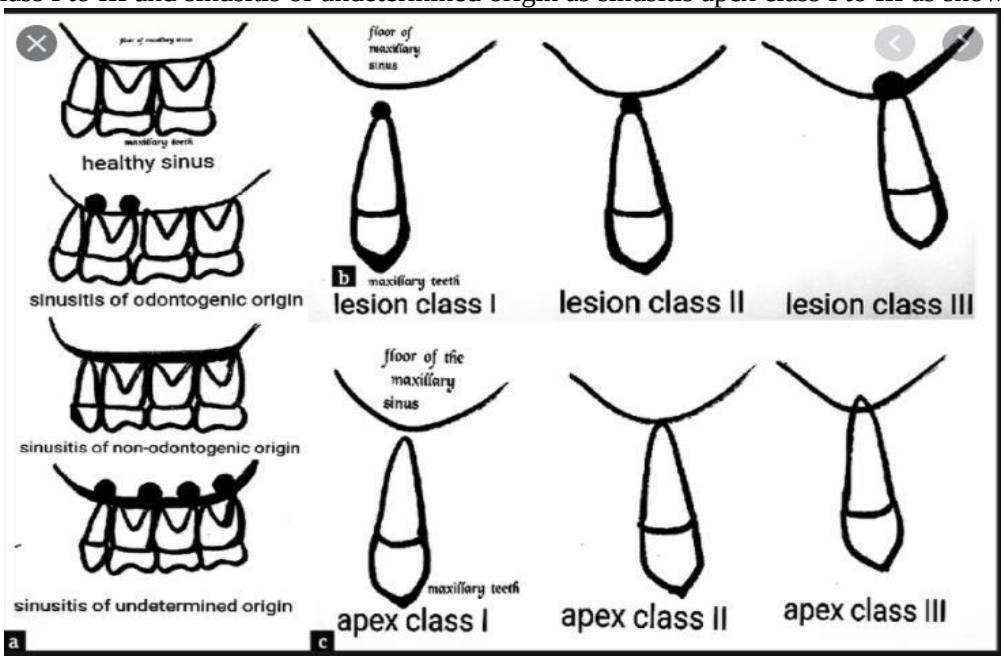

Figure 9: Diagram showing types of classification proposed by Abraham & Glassberg[5]

Grade 3 fluid levels were found significantly more frequently among patients with odontogenic sinusitis than among other patients. It can be speculated that compared with other sinusitis-related infections, odontogenic infections exhibit a different bacterial composition with more anaerobic flora, resulting in fewer clinical symptoms.[7]

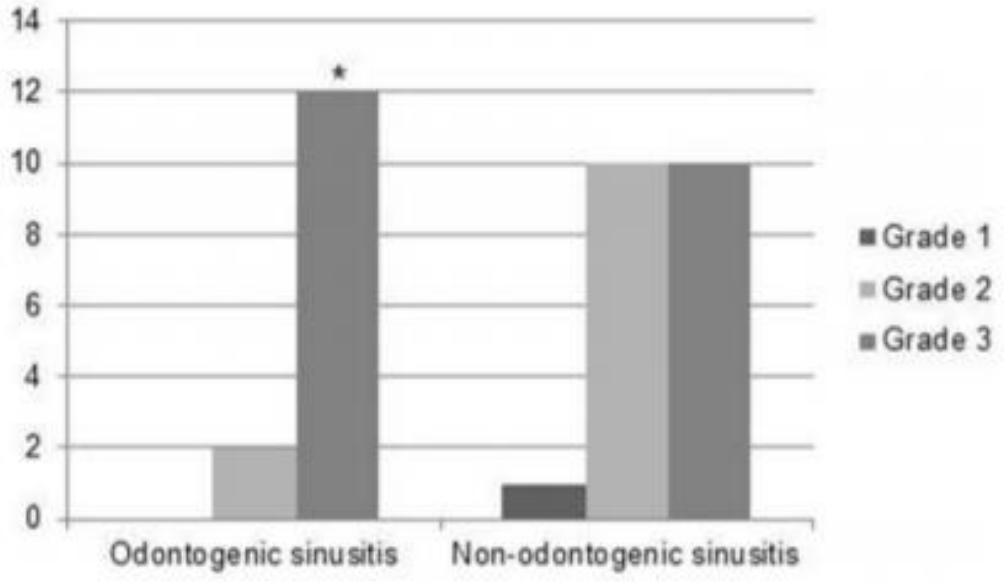

Figure 10: Fluid level, including mucosal swelling in the maxillary sinus

Grade 1: Fluid level less than 1/3rd of the maxillary sinus is congested
Grade 2: Fluid level 1/3rd-2/3rd of the maxillary sinus is congested
Grade 3: Fluid level more than 2/3rd of the maxillary sinus is congested

CBCT, is a relatively new modality, it has a significant role in diagnoses of pathologies of teeth, jaws and sinuses. The most frequent medical conditions of the sinuses can be diagnosed radiologically using this approach.[8] CBCT also provides optimal imaging of supporting tissue surrounding teeth to enable the detection of odontogenic causes of sinusitis. As per the ALARA principle, this new modality also utilizes approximately 10% of the radiation dose of conventional CT, and is able to image bony detail exquisitely, although soft tissue detail is reduced.[9] Thus, less hazardous to the patient. As the primary treatment of maxillary sinusitis is antibiotics but if the patient fails to recover with the regimen, an otolaryngologist should also suspect for maxillary sinusitis of odontogenic sinusitis. Successful management of Maxillary sinusitis of endodontic origin (MSEO), as with any infection of endodontic origin, is focused on removing the nidus of infection and preventing reinfection. The principle objectives for treatment of MSEO are removal of the pathogenic microorganisms, their by-products and inflammatory causes, and pulpal debris from the infected root canal system.[10] Appropriate treatment options include nonsurgical root canal therapy, periradicular surgery when indicated, intentional replantation, or extraction of the infected tooth. Clinicians performing endodontic treatment in the posterior maxillary dentition should have extensive knowledge of maxillary root canal anatomy owing to the anatomic complexities in this region, the necessary armamentarium, and requisite clinical skill.[11] Inadequate root canal treatment and incomplete filling of the canal, particularly missed mesio-buccal canal systems, is a very common cause of endodontic failure in maxillary molars.[12]Thus, Endodontists are specialists in managing with these complexities of root canal systems.[13]

5. CONCLUSION:

Maxillofacial CBCT is a confirmative technique for radiological diagnostics of odontogenic sinusitis. Thus, the cooperation between the dentists and otorhinolaryngologists in the field of diagnostics and treatment of odontogenic sinusitis is necessary for obtaining best results.

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