CASE REPORT

Management of maxillary sinusitis of endodontic origin: A case report

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Abstract

Endodontic implications of the maxillary sinus comprise extension of periapical lesion into the sinus. Though the actual cause of sinusitis is difficult to determine accurately, majority of the cases occur through a dental cause. The purpose of this paper was to present the management of maxillary sinusitis of endodontic origin. A 48-year-old generally healthy male patient reported to the dental clinic for the implant placement in the area of missing #26. During the procedure, the dental surgeon noticed a thick granulation tissue in the deep area with a painful sensation. Further, endodontic consultation revealed the tooth #25 was endodontically treated 9 years ago, and cone beam computed tomography showed periapical lesion perforated the maxillary sinus. Extraction and enucleation were done and the biopsy sent to the histopathological laboratory revealed periapical granuloma. After 2 months, patient was asymptomatic and ENT examination showed the floor of maxillary sinus with reduced hyperplasia. Symptoms of maxillary sinusitis can induce pain of dental origin, and a cautious differential diagnosis is essential when dealing with pain in the maxillary posterior region.

Keywords: Maxillary sinusitis, mucositis, odontogenic origin

Introduction

Endodontic implications of the maxillary sinus comprise extension of periapical lesion into the sinus. The literature mentions many cases of extension of periapical infection to the maxillary sinus. Stafne estimated that 15-75% of the sinusitis cases occur through a dental cause although the actual cause is difficult to determine accurately. Sinusitis can be divided into acute, subacute and chronic types. Symptoms produced by acute or subacute maxillary sinusitis can be misguided with those of pulpal basis. A comprehensive examination of the patient’s medical and dental history will draw the attention of the clinician to endodontic implications of odontogenic origin.

The purpose of this paper was to present the management of maxillary sinusitis of endodontic origin.

Case Report

A 48-year-old generally healthy male reported to the dental clinic for the implant placement in the area of missing #26. During the procedure, the dental surgeon noticed a thick granulation tissue in the deep area and the patient started feeling painful sensation even with repeated anesthesia. The surgeon then put bone graft material and closed the flap for further consultation. Patient was then shifted from implant clinic to the diagnosis clinic for examination of tooth #25 that had periapical lesion. It was revealed during the examination that the tooth #25 had undergone root canal treatment 9 years ago. The pre-operative radiograph had revealed a large periapical lesion with interrupted lamina dura around the tooth #25 with previous root canal filling material and filling on the crown. The periodontal probing was within normal limits for all teeth in the upper left region, and the teeth #24 and #25 was restored with amalgam. The tooth showed no response to cold and electric pulp testing and it was tender on percussion, but not on palpation. The tooth was diagnosed as previously treated with symptomatic periapical periodontitis.

After the clinical examination, cone beam computed tomography (CBCT) radiography was taken to check the maxillary sinus involvement. CBCT revealed a periapical lesion that perforated the maxillary sinus with thickening of the maxillary sinus floor. Patient then referred to ENT department for consultation. They advised, (i) Extraction of the involved tooth to remove the source of infection and the thickening of the floor will get resolved upon follow-up, or (ii)
to inoculate the lesion completely through endoscope under general anesthesia.

![Preoperative radiograph](image1)

**Figure 1:** Preoperative radiograph

Patient presented to the endodontic clinic for the treatment plan and decision-making. The endodontist advised root canal re-treatment of #25 followed by surgical root end resection and retrograde filling along with enucleation of the lesion with precaution to the maxillary sinus perforation. However after consultation with a prosthodontist, it was decided to extract the tooth #25 as it was questionable in restorability.

Hence, the recommended treatment was extraction, and the final diagnosis was maxillary sinusitis of endodontic origin. Patient referred to Oral and Maxillofacial Surgery department where extraction of tooth #25 and enucleation of the lesion was performed [Figures 4 and 5]. The biopsy was sent to the histopathology lab. Post-surgical instructions were given to the patient and was prescribed capsule amoxicillin 500 mg tid, tablet bufen 600 mg, rhinocort along with anti-histamines and decongestants. Biopsy report showed periapical granuloma, which confirmed the diagnosis. On the follow-up after 2 months, patient was asymptomatic and posterior-anterior radiograph

![Clinical view](image2)

**Figure 2:** Clinical view

![Removal of the lesion from the socket](image4)

**Figure 4:** Removal of the lesion from the socket

![CBCT show periapical lesion perforate the sinus floor](image3)

**Figure 3:** CBCT show periapical lesion perforate the sinus floor

![Socket preservation](image5)

**Figure 5:** Socket preservation
revealed socket space [Figure 6]. ENT examination showed the floor of maxillary sinus with reduced hyperplasia.

Discussion
Radiographic examination of the maxillary sinus includes periapical, occlusal, panoramic and facial views. Panoramic radiography provides a wide overview of the sinus floor and its anatomical relation with the tooth roots allows the determination of the size of periapical lesions. The symptom associated with maxillary sinusitis is a feeling of “fullness” around the upper posterior teeth, or dull pain, commonly unilateral and during mastication. The patient may complain of pain exacerbated when lying down or bending due to increased intracranial pressure from blood flow, and the affected sinus may be tender to palpation. The teeth in relation to affected sinuses will be sensitive to palpation and/or percussion. Nasal discharge is considered to be an important sign of sinus infection. The use of a topical nasal decongestant often helps in differentiating pain from sinusitis or from dental origin. On the other hand, the pain of dental origin ranges from thermal sensitivities to continuous sharp pain, which may be associated with localized swelling. Radiographic changes in sinusitis show thickened sinus mucosal membrane and air-fluid filled.

The first time that showed the direct extension of dental infection into the sinus was in a study by Bauer in 1943. His study was done on cadavers and revealed the pulp of involved teeth with histological evidence of extension of infection into the maxillary sinus. The local hyperplasia of dental basis in the mucosa of the maxillary sinus could be removed by conservative root canal therapy. Selden and August in 1970 also managed maxillary sinusitis after the treatment of a periodontal-endodontic lesion in first and second premolars. For the refractory cases after a conservative management, the surgical approach was recommended. In this case, the restorability of the tooth made the final decision.

At least 70% of bacterial contamination of sinusitis is caused by Streptococcus pneumoniae and Haemophilus influenzae. Antibiotics are a vital part of controlling an acute suppurative sinusitis. Pinheiro et al. suggested amoxicillin as a first-line of treatment aimed to cover both Gram-positive and Gram-negative organisms. Topical decongestants are beneficial for oxygenation and facilitate the sinus drainage of pus by decreasing the edema. Analgesics like paracetamol and non-steroidal anti-inflammatory drugs are beneficial for the control of pain.

Conclusion
The close anatomical inter-relationship of the maxillary sinus and the roots of upper posterior teeth can lead to endodontic complications. Periapical inflammation can result in maxillary sinusitis of dental basis with subsequent inflammation and thickening of the mucosal lining of the sinus in areas next to the corresponding teeth. In such cases, the conventional endodontic treatment or re-treatment is the treatment of choice with surgical intervention. However there is a chance of refractory case, which requires extraction to remove the source of infection. An adequate diagnosis and appropriate treatment with antibiotics, decongestants and analgesics are needed for the treatment of sinusitis.

References