



ORIGINAL RESEARCH PAPER

Maxillofacial Surgery

RETRIEVAL OF DISPLACED ROOT FRAGMENT ASSOCIATED WITH FUNGAL BALL IN THE MAXILLARY SINUS USING FUNCTIONAL ENDOSCOPIC SINUS SURGERY- A CASE REPORT

KEY WORDS: Maxillary sinus, Displaced root fragment, Functional endoscopic sinus surgery(FESS)

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ABSTRACT

Introduction: Fungal ball is a non-invasive sinus disease and the incidence of this disease has increased in recent years and also several case reports and case series have suggested a relationship with the accidental displacement of root into maxillary sinus. We report a case where fungal ball was removed along with the dental root fragment which was accidentally displaced into the maxillary sinus following traumatic dental extraction. **Case Report:** A 32-years-old female patient presented to Maxillofacial Surgery Department with complaint of pain in the left orofacial region for one month. The patient had a history of traumatic extraction of posterior maxillary teeth 4 years back. On examination, no dental cause of pain was detected. On further evaluation, a foreign body within the left maxillary sinus was seen in the panoramic radiograph. Computed tomography images revealed displaced root in the left maxillary sinus with surrounding heterogenous soft tissue opacity. Following the detection of foreign body, patient underwent Functional Endoscopic Sinus Surgery (FESS) and the root was retrieved and the adjacent soft tissue specimen was sent for histopathological examination. The presence of fungus consistent with the *Aspergillus* species was confirmed. **Conclusion:** This article emphasizes the importance of atraumatic dental extraction, the association of fungal ball with displaced root and the utility of FESS in clearing the same.

INTRODUCTION:

The maxillary sinuses are of interest to dental surgeons for their proximity to the area in their day today practice. Sometimes, maxillary sinus floor might approach close to the roots of posterior maxillary teeth. This results in the increase of various complications when performing dental procedures in relation to maxilla including sinusitis, sinus membrane perforation, oroantral communication and, root displacement into the maxillary sinus.¹ The intrasinus displacement of drills, endodontic material, or implants also had been reported in the literature. Such a displacement exposes the patient to potentially serious complications, including the development of pneumonia or septic thrombosis of the cavernous sinus in rare cases.²

A fungal ball consists of a non invasive dense accumulation of fungal hyphae usually in a unilateral maxillary sinus, although the process has been described to involve other and multiple sinuses much less commonly. Diagnostic criteria include (1) sinus opacification with heterogeneity on imaging (2) greenish yellow friable material within the sinus cavity, (3) a dense collection of fungal hyphae separate from the sinus mucosa, (4) nonspecific chronic inflammation of the mucosa, (5) without predominance of eosinophils or granuloma or allergic mucin, and (6) absence of fungal invasion of the mucosa on histopathology. Other terminologies for fungal ball include mycetoma and aspergilloma.³ *Aspergillus fumigatus* is the most common causative agent with histopathology revealing dense accumulation of hyphae in concentric layers.⁴ Fungal ball is usually asymptomatic and it may take several years for the symptoms to occur. It is usually detected incidentally with the characteristic appearance of heterogenous soft tissue density involving mostly the maxillary sinus on radiographic examination. In symptomatic cases, the clinical manifestation of fungal ball is often

nonspecific and includes purulent or blood-stained nasal discharge, chronic facial pain, nasal congestion, cacosmia, and orbital pain.⁵ Several case reports and case series have suggested a relationship between the accidental displacement of root into maxillary sinus, introduction of endodontic medication beyond the apical foramen into the maxillary sinus and fungal ball.^{4,5} Complete removal of the lesion along with the displaced tooth or endodontic materials via the Caldwell-Luc or endoscopic assisted surgical techniques with the establishment of natural sinus drainage is sufficient for the management of fungal ball.⁵

No subsequent treatment is indicated, given the process is non invasive by definition.³ This article aims to describe the use of Functional endoscopic sinus surgery (FESS) to remove the fungal ball along with the dental fragment which was accidentally displaced into the maxillary sinus, during the attempt to remove a maxillary first molar.

METHODOLOGY:

This article details the case of a patient who underwent removal of a fungal ball along with root fragment displaced to the maxillary sinus by the FESS. Informed Consent was obtained from the patient about the procedure.

CASE REPORT:

A 32-year-old female, attended the Oral and Maxillofacial Surgery department with the complaint of pain in the left orofacial region along with heaviness in the left side of the face. Patient was systemically healthy. Upon clinical examination, no dental causes was detected except the history of traumatic extraction of maxillary posterior teeth before 4 years elsewhere.

A digital panoramic radiographic examination showed a

radiopaque area along the floor of left maxillary sinus (Figure 1).



Fig. 1. Panoramic radiograph shows a radiopaque mass in the left maxillary sinus.

Computed Tomography imaging showed displaced root in the left maxillary sinus with surrounding heterogenous soft tissue opacity (Figure 2).



Fig. 2. Computed tomogram (Axial view/ Sagittal view/ Coronal view) showing the radiopaque mass with heterogenous soft tissue opacity in the left anteromedial aspect of the maxillary sinus.

FESS was proposed for clearance of the foreign body and fungal ball. Uncinectomy and wide middle meatal antrostomy (MMA) done. Fungal debris was seen in the anteromedial portion of the maxillary antrum surrounding the displaced root (Figure 3).

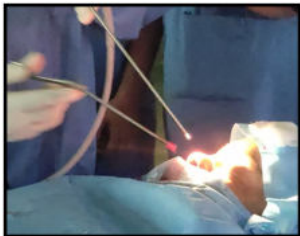


Fig. 3. Intraoperative image of retrieval of root fragment

Complete clearance was done. All walls were intact and there was no evidence of breach in the floor. Specimen was sent for fungal culture and histopathological examination (Figure 4).

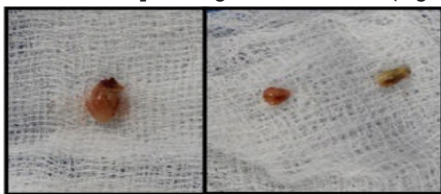


Fig. 4. Retrieval of root fragment along fungal ball

The histopathological report was consistent with aspergilloma and culture report showed no fungal growth. The patient was followed up with endoscopic examination after 3 months which showed wide patent MMA with healthy sinus mucosa (Figure 5). Patient had no complaints.



Fig. 5. Third month postoperative panoramic radiograph

DISCUSSION:

Tooth or root displacement in the maxillary sinus is most likely to occur when the root apices of premolars and maxillary first molar root are in close relation to the floor of sinus or when the floor has been eroded by a periapical lesion during an extraction of an isolated molar, sometimes it may also occur during their elective removal.⁶ In a report by Hara et al., out of 407 cases of foreign bodies displaced towards maxillary sinus, 220 were tooth roots.⁷

Stammler et al., quoted Schubert as the first to describe aspergillosis of the nose and paranasal sinuses in 1885.⁸ It is always believed that there is an important relationship between the fungal growth of *Aspergillus* in the maxillary sinus and the presence of foreign bodies within the sinus.⁹ The aerogenic theory claims that the inhaled spores of fungus deposit in the paranasal sinuses become pathogenic when the conditions of the sinus inside become relatively anaerobic. Another theory suggests that the functional blockage of the sinus ostium could act as an inducing factor and that the fungal growth could be favoured by the hypoxic and anaerobic conditions. Moreover the reduction of the ventilation would diminish pH, favoring the fungal growth.¹⁰ This opportunistic fungal infection is characterized by noninvasive growth with the development of an agglomeration known as a fungus ball. Literature contains various case reports describing the relationship between the appearance of fungus balls and the accidental displacement of dental materials, teeth and foreign bodies into the maxillary sinus. Most of the cases are asymptomatic with nonspecific manifestations in the form of nasal obstruction, rhinorrhea, cacosmia, and facial or dental pain.⁸

Surgery is the treatment of choice for fungus ball which has the role of removing fungal debris from the affected sinus and reestablishing proper ventilation and drainage. Caldwell-Luc approach to clear disease in maxillary sinus used to be the norm before endoscopic techniques became mainstream. Endoscopic approach is now considered the gold standard in the treatment of paranasal sinus fungal ball due to its low morbidity and the easy access to the affected paranasal sinus.¹¹ FESS is an efficient approach to retrieving the root tip from the maxillary sinus antrum while keeping sinus function intact.¹² Outcome is good with complications reported at less than 1%.¹³

CONCLUSION

The displacement of teeth or dental fragments into the sinus, although rare, may occur during extraction of maxillary molars which can subsequently lead to formation of fungal ball. These incidents should be addressed as soon as possible¹⁴ and FESS is a feasible and minimally invasive endoscopic procedure for root fragment retrieval.

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