



Maxillary sinus Aspergillosis associated with tooth-root piece : A Case report

KEYWORDS

Mycetoma, Maxillary sinusitis, Aspergillus

* Amita Rani

Sonal Sharma

Senior Resident, Department of Dentistry, UCMS & GTBH, New Delhi. * Corresponding Author

Associate Professor, Department of Pathology, UCMS & GTBH, New Delhi

ABSTRACT Fungal infection of maxillary sinus in immunocompetent person is a relatively rare phenomenon. Dental procedures involving overextended root-filling materials like Zinc oxide eugenol, gutta-percha has been reported associated with aspergillosis. *Aspergillus fumigatus* needs heavy metals such as zinc oxide for proliferation and metabolism. Aspergillosis of maxillary sinus have also been reported with Zygomatic implants in some case reports. But no case of dislodged root piece associated with maxillary sinus aspergillosis has ever been reported in literature. Here we are discussing a case of aspergillosis of unilateral maxillary sinus in an immunocompetent patient associated with dislodged root piece. This patient was successfully managed with surgical debridement and antifungal drugs. Patient followed up for six months, did not show any sign of recurrence.

Introduction:

Non-invasive aspergillosis (fungal ball or Aspergilloma or Aspergillus Mycetoma) of the maxillary sinus is a relatively common fungal disease that usually develops unilaterally in the maxillary sinus without bony invasion. It is most frequently found in older individuals and has a female preponderance.^[1] It is frequently diagnosed in patients with prolonged history of recurrent maxillary sinusitis, or is incidentally diagnosed on imaging studies, such as computed tomography (CT) or magnetic resonance imaging (MRI). The treatment of choice for a fungal ball is complete surgical removal. The recurrence rate is very low after the surgery.^[2] Their pathogenesis remains largely unknown. It is generally related to the inflammatory process associated with dental procedures on the maxillary teeth.^[3] However, no confirmation of this correlation has been reported. The floor of the maxillary sinus can be opened or damaged during extraction, which can cause maxillary fungal infection or rhinosinusitis.

Case report: Here we are discussing a case of maxillary sinus aspergillosis associated with tooth-root piece. A forty-two years old immune-competent female presented to our department with complaint of heaviness and pain in left side of upper jaw since last three months. Pain increased on bending down. She had history of premolar extraction six months back. Clinically we found tenderness over left maxillary sinus. Intraoral examination revealed healed extraction socket of left maxillary second premolar. The overlying mucosa was normal and the adjacent teeth were free from caries or any other periodontal pathology. PNS view (Water's) showed slight opacity in left maxillary sinus, but was not confirmatory. So CT PNS was advised. CT Scan (coronal section) showed a break in continuity of left maxillary sinus floor in premolar region along with radio-opacity in alveolus suggestive of foreign body/root piece. A soft tissue density was seen occupying the lower portion of left maxillary sinus (fig. A). It was decided to surgically explore the site using crestal incision and raising L-shaped mucoperiosteal flap. Surgical exposure revealed bony irregularity and sinus opening in second premolar region over buccal wall. Bony window was widened with bur and adequate access to maxillary sinus in premolar region revealed a root piece along with cheesy and clay like yellowish-green colored fungal mass of approx. 1x1cms in maxillary sinus

(fig. B). Adequate irrigation was done to clear the sinus from all fungal debris and primary closure was done. Histopathologic examination of fungal mass revealed the fungus with branching hyphae, confirmed the diagnosis of aspergillosis (fig. C).

The patient was kept on oral itraconazole 100 mg twice daily for 2 months and was followed monthly for six months, as the patient was symptomatic after surgery. At follow up the patient remains free of clinical disease (fig. D).

Discussion

Aspergillosis is a fungal infection caused by fungi of the genus *Aspergillus*. This fungus contaminates the paranasal sinuses by two routes. In the first or the aerogenic route the spores are inhaled directly into the antrum where they multiply best in the anaerobic medium. The second route involves an iatrogenic mode where spores are introduced into antrum via an oroantral communication formed due to root canal perforation or dental extraction. In our case, it is a possibility that the sinus was infected by airborne fungus during attempted extraction.

Katzenstein described the first case of aspergillosis of the paranasal sinus in 1983. In the past, foreign bodies were shown as an etiological factor for aspergillosis.^[4,5] Burnham and Bridle reported a case of maxillary sinus aspergilloma, which was triggered due to extrusion of an amalgam filling.^[6] Liston and Walters presented a case of aspergillus sinusitis where six gutta percha points served as etiological agents after being accidentally introduced into the maxillary sinus.^[7] Sato FR1, Sawazaki R reported aspergillosis of maxillary sinus with Zygomatic implants.^[8] Akifuddin Syed, Prashanth Panta presented a case of a foreign body in the nasal cavity in the middle of necrotic tissues and might have served as a source of contamination.^[9] No case of maxillary sinus aspergillosis associated with tooth root has been reported in literature.

Prompt recognition with the use of modern imaging modalities and identification of the fungus is of paramount importance in early diagnosis. Radiographic changes in non-invasive mycetoma include the presence of radiodense foci in association with homogeneous opacification of the

sinus and it is found to affect only one sinus at a time.^[10]

Management of aspergillosis mycetoma requires the removal of the mycotic mass and restoration of mucociliary drainage and sinus ventilation. The combination of aggressive surgical debridement and systemic antifungal therapy is considered to be the standard management for invasive aspergillosis of the paranasal sinuses.^[11] Effective surgical treatment requires adequate exposure to remove all necrotic, devascularized tissue with the ultimate purpose is to permit the antifungal agent to reach the involved site. Although endoscopic techniques have the advantage of maintaining the sinus anatomy, they can limit the access and suboptimize the results of debridement.

Grossly, the infective tissue exhibits yellowish, brown, grey or black color, cheesy in consistency containing dirty or muddy material. The pattern in a culture medium is always circular because of centrifugal linear growth unless inhibited by natural or artificial barriers. This is why aspergillus in the paranasal sinus eventually develops into a ball-shaped mass.^[12] The center of the mass contains calcium phosphate and therefore mimics a foreign body on radiography.^[13] In our case dense radio opaque mass was evident in sinus on radiographs.

Conflict of interest: none

Funding: none declared

Fig. A: CT coronal view showing break in continuity of left maxillary sinus floor along with radio-opacity in maxillary sinus.

Fig. B: Intraoperative photograph showing cheesy and clay like yellowish fungal mass in maxillary sinus

Fig. C: Microscopic picture (H & E 40X)

Fig. D: Six-month postoperative CT coronal view showing normal maxillary sinus.

References

- Grosjean P, Weber R. Fungus balls of the paranasal sinuses: a review. *Eur Arch Otorhinolaryngol.* 2007 May;264(5):461-70
- Dufour X, Kauffmann-Lacroix C, Ferrie JC, Goujon JM, Rodier MH, Karakas A, et al. Paranasal sinus fungus ball and surgery: a review of 175 cases. *Rhinology* 2005 Mar;43(1): 34-9
- Mensi M, Piccioni M, Marsili F, Nicolai P, Sapelli PL, Latronico N. Risk of maxillary fungus ball in patients with endodontic treatment on maxillary teeth: a case-control study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2007 Mar;103(3):433-6
- D. H. Lee and S. C. Lim, Maxillary fungus ball caused by retained foreign bodies for 25 years. *Journal of Craniofacial Surgery.* 2012;23(3):176-7
- F. Legent, J. Billet, C. Beauvillain, J. Bonnet, and M. Miegerville. The role of dental canal fillings in the development of Aspergillus sinusitis—a report of 85 cases. *Archives of Oto-Rhino-Laryngology.* 1989;246(5):318–20
- R. Burnham and C. Bridle. Aspergillosis of the maxillary sinus secondary to a foreign body (amalgam) in the maxillary antrum. *British Journal of Oral and Maxillofacial Surgery.* 2009;47(4):313–15
- P. N. Liston and R. F. Walters. Foreign bodies in the maxillary antrum: a case report. *Australian Dental Journal.* 2002;47(4):344–46
- Sato FR1, Sawazaki R, Berretta D, Moreira RW, Vargas PA, de Almeida OP. Aspergillosis of the maxillary sinus associated with a zygomatic implant. *J Am Dent Assoc.* 2010 oct;141(10):1231-5
- Akifuddin Syed, Prashanth Panta, Imran Shahid, and David H. Felix. Invasive Aspergillosis Associated with a Foreign Body. *Case Reports in Pathology.* 2015;Article ID 875168, 5 pages <http://dx.doi.org/10.1155/2015/875168> .
- Ferreiro JA, Carlson BA, Cody DT. Paranasal sinus fungus balls. *Head Neck.* 1997;107:112-17

- Costa F, Polini F, Zerman N, Robiony M, Toro C, Politi M. Surgical treatment of Aspergillus mycetomas of the maxillary sinus: review of the literature. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2007;103(6):e23-9
- Rossouw DP, Swart JG. Aspergillus fumigatus infection of the maxillary sinus. *S Afr Med J.* 1988;73:47–78
- Ogata Y, Okinaka Y, Takahashi M. Antrolith associated with Aspergillus of the maxillary sinus: report of a case. *J Oral Maxillofac Surg.* 1997;55:1339–41