



Acute Rhinosinusitis associated with post extraction of maxillary right third molar

Dr. Faraz Ahmed, Dr. Amit Kumar Pathak, Dr. Sagnik Banerjee, Dr. Rahul Jainer
BDS, MDS Pediatric and Preventive Dentistry

***Corresponding Author:**
Dr. Amit Kumar Pathak
BDS, MDS Pediatric and Preventive Dentistry

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Background: Rhinosinusitis is the inflammation of nasal cavity & paranasal sinus. Because of very close contact between the maxillary posterior teeth and sinus, maxillary sinusitis can cause localized pain around the tooth. The difference between pain due to maxillary sinusitis & odontogenic orofacial pain is crucial to exclude needless dental procedures. On the contrary, odontogenic infection can extend to the antrum, which is called odontogenic sinusitis, or maxillary sinusitis of dental origin. Rhinosinusitis occurs in about 10–40% of all cases of sinusitis & generally needs both dental & medical attention. Rhinosinusitis can also be a complication of exodontia, resulting from displaced teeth or root fragments, tuberosity fractures & oroantral communications.

Aim- The aim of this case report is to show management of a patient who developed rhinosinusitis following extraction of maxillary right third molar which was confirmed by cone beam computed tomography.

Clinical significance- The dental team must seek for suitable investigations before every surgical treatment & execute the treatment that demands a reasonably prudent approach. They also require to ensure that any difficulty, occurring during or as post-operative complications, can be rectified thus making the patient symptom free.

Keywords: CBCT, Extraction, Sinus, Third Molar

INTRODUCTION

Of all the paranasal sinuses, maxillary sinus is the widest of the all-encompassing the whole maxillary body. It's a triangular pyramid with apex facing the zygomatic process of maxillary bone & base towards the lateral nasal wall.^{1,2} It has a large volume, capillary fragility & proximity to the root apices of the maxillary posterior teeth, which permits a direct link between oral cavity & sinus.

Frequently it is said that rhinosinusitis may come up with a halitosis complaint & generally used diagnostic protocols for rhinosinusitis occasionally record halitosis as a minor criterion. However, benchmark research like organoleptic assessment have not been practiced to confirm an association between objective (genuine) halitosis & sinusitis. The etiology of this is doubtful & the comparative significance of this with other reasons of extraoral halitosis is controversial.

In spite of the fact that foreign bodies are rarely seen within the paranasal sinuses, objects can get lodged in the paranasal sinuses as a result of psychiatric disorders, improper surgical procedures, etc. During the dental surgery, the maxillary molar teeth or a part of it can get dislocated within the maxillary sinus cavity. This rare circumstance accounts for 0.6–3.8% of iatrogenic cases of foreign body entrapment in paranasal sinuses.³ This can happen because of improper or insufficient application of elevators, due to the close anatomical association between the maxillary molar teeth and the maxillary sinus. Radiographs play a vital role in the diagnosis & orthopantomogram is traditional method used; Water's method & computed tomography can be done too.⁴ When the tooth gets dislodged in the maxillary sinus, surgical extraction is the best approach.

Case Report

A 39-year-old female patient came to the clinic with a chief complaint of pain in her upper right back tooth region for 1 week. The patient was physically healthy and had a previous history of dental treatment which was uneventful. Extraoral examination revealed normal findings. Intraoral examination revealed carious maxillary right third molar (Tooth No. 18).

Since the patient had limited mouth opening an Orthopantomogram was taken which revealed radiolucency involving pulp (Figure 1a). After taking the informed consent, uneventful extraction was performed under local anesthesia (Figure 1b) following which a post extraction intraoral periapical radiograph was taken (Figure 1c) and 3 interrupted sutures were placed.



Figure 1a: Orthopantomogram



Figure 1b: Extracted tooth



Figure 1c: Post extraction IOPA

After 10 days, sutures were removed but patient complained of foul-smelling pus discharge from the extraction site. A CBCT was advised. CBCT scan performed with CS 9300 scanner at resolution (0.3mm x 0.3mm x 0.3mm). 3D images were provided with cross-sectional interval = 1.0mm. (Figure 2a, b)

CBCT revealed un-mineralized socket with buccal cortical defect till the apical alveolus in the region of 18. Thinning & focal defect was seen in adjoining floor of the right maxillary sinus. Soft tissue density was seen within the socket with no obvious evidence of any frank oro-antral communication.

Nose & paranasal sinuses revealed polypoidal mucosal thickening partially obliteration to the right maxillary sinus. Mucosal thickening obliteration the right maxillary sinus ostium was also noted. Mild deviation of the bony nasal septum to the right was seen. Soft tissue hypertrophy was seen of the right middle turbinate with mucosal thickening in the right osteo-meatal complex. Mild soft tissue hypertrophy is also noted of the right inferior turbinate. Mucosal thickening was seen in the right anterior & middle ethmoidal aircells. Mucosal thickening & obliteration was seen of the right nasofrontal duct. Mild to moderate mucosal thickening was also noted in the inferior third of the right frontal aircells. Normal aeration was seen in the left maxillary sinus with patent left maxillary sinus ostium. Normal aeration

was seen in left ethmoidal aircells, left frontal aircells & in the sphenoidal sinus. The sphenoidal sinus showed seller type pneumatization with pneumatization of the lateral recesses.

Other findings were marginal to mild horizontal bone loss was seen with the teeth. Bilateral bony orbital outlines appear intact. Bilateral zygoma & zygomatic arches were intact. There were no overt changes of degenerative arthropathy in bilateral TMJ. The final diagnosis was right sided Rhinosinusitis (involving the right maxillary, ethmoidal & frontal sinuses). The patient received postoperative antibiotic therapy for 10 days (empirical amoxi/clav that was maintained) and corticosteroid spray (2/d) for 6weeks.

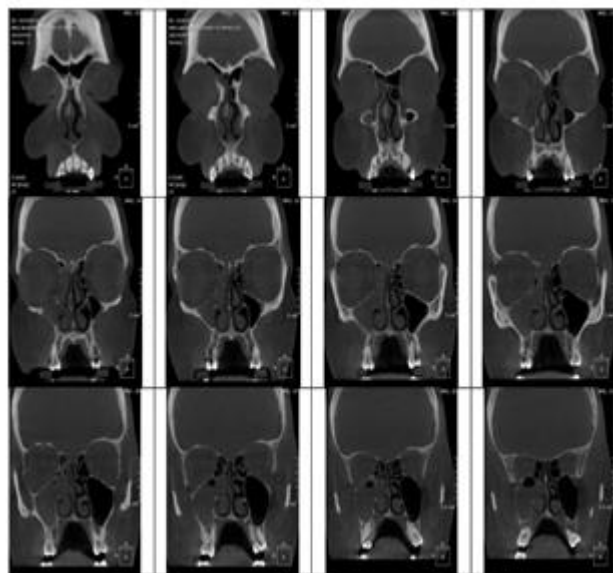


Figure 2a: Coronal Section

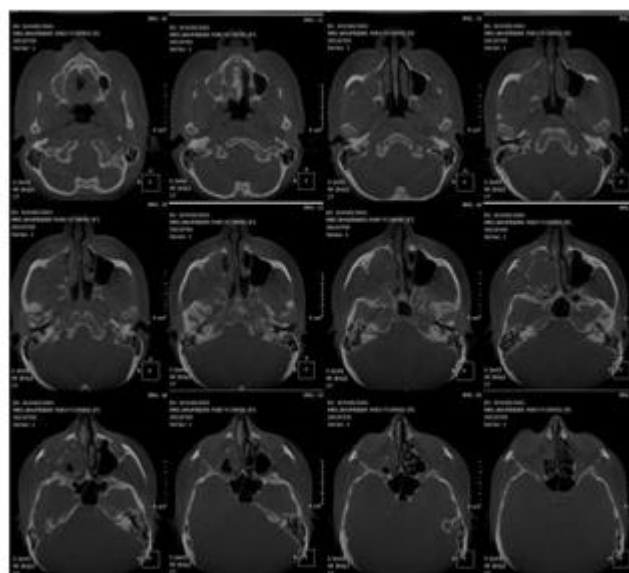


Figure 2b: Axial Section

Discussion

The more accurate term for sinusitis is Rhinosinusitis because the nasal mucous membranes & sinuses are adjacent & subject to the same disease process making sinusitis without rhinitis very uncommon. The symptoms of rhinosinusitis are classified into major & minor categories (Table 1)^{5,6} & association of these symptoms yield a diagnosis based on patient's history.

Major	Minor
1. Facial pain/pressure/fullness	1. Headaches
2. Nasal obstruction/blockage	2. Pyrexia (other than acute rhinosinusitis)
	3. Halitosis

3. Nasal or postnasal discharge/purulence (by history or physical examination).	4. Fatigue
4. Hyposmia/anosmia	5. Odontalgia
5. Pyrexia (in acute rhinosinusitis only)	6. Cough
	7. Ear pain/pressure/fullness

Table 1: Signs and Symptoms associated with Rhinosinusitis**Classification of Adult Rhinosinusitis**

In 1996 the American Academy of Otolaryngology–Head and Neck Surgery validated the baseline criteria for distinguishing the subtypes of rhinosinusitis (acute, recurrent acute, subacute and chronic) Table 2^{5, 6}. Few years ago no diagnostic criteria & disease staging system was there to distinguish between several subtypes of rhinosinusitis

CLASSIFICATION	DURATION	HISTORY, EXAMINATION	SPECIAL NOTES
Acute	Up to 4 weeks	The presence of 2 or more major signs & symptoms; 1 major and 2 or more minor signs or symptoms; or nasal purulence on examination*	Fever or facial pain/pressure does not constitute a suggestive history in the absence of other nasal signs and symptoms. Consider acute bacterial rhinosinusitis if symptoms worsen after five days, if symptoms persist for 10 days or with symptoms out of proportion to those typically associated with viral infection.
Subacute	4 to < 12 weeks	Same	Complete resolution after effective medical therapy.
Recurrent acute	4 or more episodes per year with each episode of at least 7 days' duration; absence of intervening signs & symptoms	Same	—

CLASSIFICATION	DURATION	HISTORY, EXAMINATION	SPECIAL NOTES
Chronic	12 weeks or more	Same	Facial pain/pressure does not constitute a suggestive history in the absence of other nasal signs and symptoms.

Table 2: Classification of Rhinosinusitis

Management & Treatment Planning for Rhinosinusitis

The usual motives for the patients with bacterial rhinosinusitis are to limit infection, decrease tissue swelling. The algorithm for determining the use of antibiotic therapy in rhinosinusitis is described in Figure 3.⁷

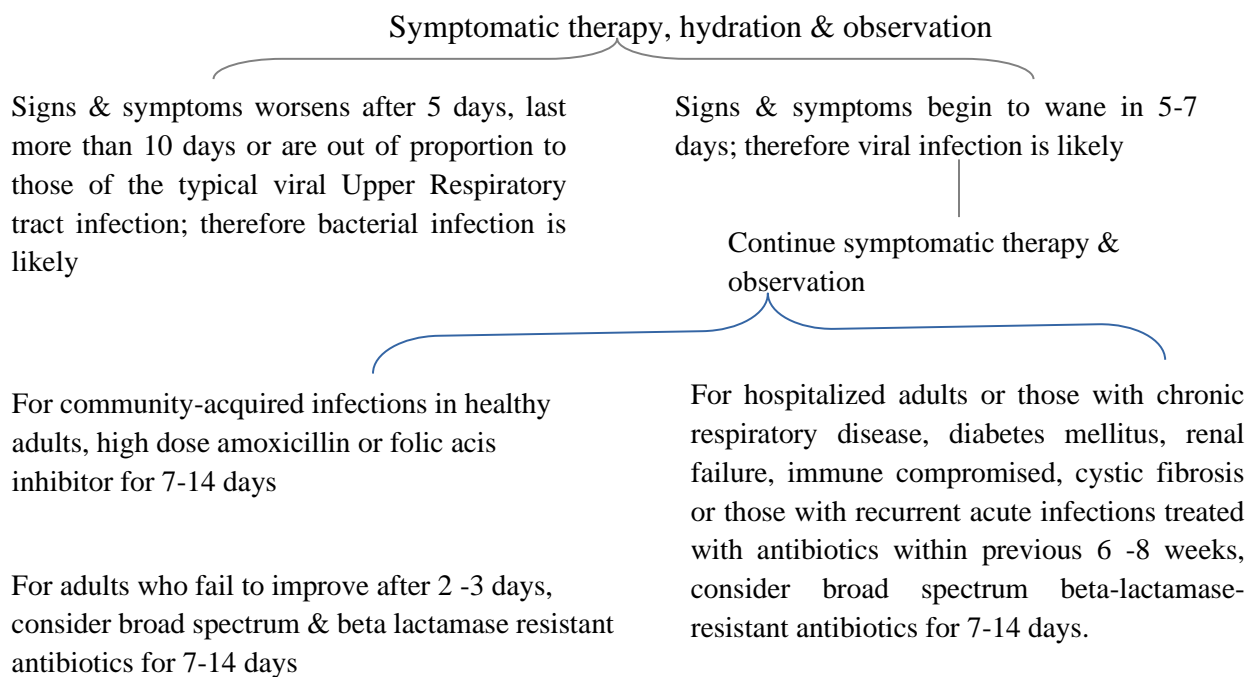


Figure 3: Algorithm for determining the use of antibiotic therapy in rhinosinusitis

In dentistry maxillary sinuses are most vital paranasal sinus because of their proximity to the maxillary teeth.⁸ Usually, the measurement between the sinus mucosa & root apex is in millimeters. Thus during the maxillary third molar exodontia because of excessive apical force there is a possibility of transposition of tooth into the maxillary sinus which is evident in the present case report.⁹ According to few authors the reason for current case can be due to uncontrolled apical force during the use of forceps and improper surgical techniques.¹⁰ Nonetheless, in these situations

the dentist should be vigilant & watchful to handle such cases to decrease accidental trauma & to achieve the desired outcome.

The orthopantomography is the usual radiographic method to validate the location of displaced fragments in the maxillary sinus, however it can lead to a distortion of 25%.¹¹ Cone beam computed tomography provides a 3 dimensional & best view which makes it essential for assessing & appropriate handling of these cases as one described in this case.¹²

During non-invasive dental procedures, iatrogenesis can occur. Thus, all patients must be informed about the possible complications & risks involved in a particular dental treatment. In the present report, exodontia of maxillary third molar might have slightly dislocated the tooth into the maxillary sinus which might have created this infection. Nevertheless, the dental surgeon was skilled to carry on with radiographs and proper medicines.

Conclusion

Thorough & proper preoperative clinical assessment is best method to prevent dental dislocation into the maxillary sinuses. The dental team must seek for suitable investigations before every surgical treatment & assess whether the surgeon has the capability to execute the treatment that demands a reasonably prudent approach. They also require ensure that any difficulty can be rectified, if possible, thus making the patient symptom free as expressed in this clinical report.

References

1. Brook, "Sinusitis of odontogenic origin," *Otolaryngology—Head and Neck Surgery*, vol. 135, no. 3, pp. 349–355, 2006.
2. W. J. Fokkens, V. Lund, and J. Mullol, "EP30S 2007: European position paper on rhinosinusitis and nasal polyps 2007. A summary for otorhinolaryngologists," *Rhinology*, vol. 50, no. 1, pp. 1–12, 2007.
3. P. Mehra and H. Murad, "Maxillary sinus disease of odontogenic origin," *Otolaryngologic Clinics of North America*, vol. 37, no. 2, pp. 347–364, 2004.
4. Melen, L. Lindahl, L. Andreasson, and H. Rundcrantz, "Chronic maxillary sinusitis. Definition, diagnosis and relation to dental infections and nasal polyposis," *Acta Oto-Laryngologica*, vol. 101, no. 3-4, pp. 320–327, 1986.
5. Lanza D, Kennedy DW. Adult rhinosinusitis defined. *Otolaryngol Head Neck Surg.* 1997;117(3 pt 2):S1–7.
6. Hadley JA, Schaefer SD. Clinical evaluation of rhinosinusitis: history and physical examination. *Otolaryngol Head Neck Surg.* 1997;117(3 pt 2): S8–11.
7. Benninger MS, Sedory Holzer SE, Lau J. Diagnosis and treatment of uncomplicated acute bacterial rhinosinusitis: summary of the Agency for Health Care Policy and Research evidence-based report. *Otolaryngol Head Neck Surg.* 2000; 122:1–7.
8. Fry RR, Patidar DC, Goyal S, Malhotra A. Proximity of maxillary posterior teeth roots to maxillary sinus and adjacent structures using Denta scan®. *Indian J Dent.* 2016;7(3):126-130.
9. Mishra AK, Sinha VR, Nilakantan A, Singh DK. Rhinosinusitis associated with post-dental extraction chronic oroantral fistula: outcomes of non-surgical management comprising antibiotics and local decongestion therapy. *J Laryngol Otol.* 2016 Jun;130(6):545-53.
10. Mamoun J. (2017). Use of elevator instruments when luxating and extracting teeth in dentistry: clinical techniques. *Journal of the Korean Association of Oral and Maxillofacial Surgeons*, 43(3), 204–211.
11. Gnigou, M., Goutzanis, L., Sarivalasis, S. et al. Retrieval of displaced implants inside the maxillary sinus: two case reports and a short review. *Int J Implant Dent* 5, 24 (2019).
12. Y. Arijji, E. Arijji, K. Yoshiura, and S. Kanda, "Computed tomographic indices for maxillary sinus size in comparison with the sinus volume," *Dentomaxillofacial Radiology*, vol. 25, no. 1, pp. 19–24, 1996.