

Chronic Maxillary Sinusitis Complicated by Right Orbital Abscess with Ruptured Globe Following Tooth Extraction: A Case Report

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ABSTRACT

Objective: This article reports a case of a chronic maxillary sinusitis complicated by right orbital abscess with ruptured globe following tooth extraction in a 70-year-old female diabetic patient 4 weeks after forceps extraction of the upper right 1st premolar.

Case Description: Patient gave a history that prior to the tooth extraction, there was a carious cavity on the tooth, pain on mastication with background nasal congestion and post nasal drip of over one year duration. 4 weeks following extraction, there was marked right buccal and periorbital swelling. Examination by the ophthalmologist revealed rupture of the right globe with copious pus discharge from the lower eyelid of the right eye. Examination by the dental team and the Head and Neck Surgeon revealed the presence of oroantral communication with pus discharge from the oroantral fistula and the retropharyngeal area. Fasting Blood Sugar on presentation was 278mg/dl. Patient was referred to the physician for optimization of her blood sugar level. Evisceration of the right eye was carried out along with incision and drainage of the right eyelid and buccal space. Intravenous ceftriaxone 1g daily, intravenous metronidazole 500mg 8 hourly, intramuscular gentamicin 80mg 8 hourly, eusol A&B dressing twice daily, paracetamol per oral 1g 8 hourly, menthol crystals steam inhalation twice daily, Diazepam 5mg nocte were prescribed for the patient. Inferior meatal antrostomy with antral washout was carried out by the Head and Neck Surgeon 2 weeks after. Following surgery, patient was placed on per oral Tavanic 500mg once daily, metronidazole 400mg 8 hourly, vitamin c 100mg 8hrly, guaifenesin/pseudoephedrine 25mg nocte, diclofenac potassium 50mg twice daily and menthol crystals steam inhalation twice daily. Review of the patient four weeks after surgery showed marked improvement in the clinical parameters of the patient, disappearance of swelling and cessation of pus from all points of previous discharge.

Conclusion: Chronic maxillary sinusitis complicated by right orbital abscess with ruptured globe following tooth extraction may be considered a potential complication of forceps extraction of maxillary premolars and molars especially in a medically compromised patient. The authors hereby recommend (1) ensuring adequate medical and dental evaluation of patients before forceps extraction (2) all medically compromised patients must be optimized before forceps extraction (3) The need for multidisciplinary management of medically compromised patients with dental diseases

Keywords: Orbital Abscess, Maxillary sinusitis, Oroantral communication, globe rupture, Forceps extraction, Diabetes Mellitus

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INTRODUCTION

The precise aetiology of chronic maxillary sinusitis, also known as chronic rhinosinusitis, is unknown.¹ It usually affects the mucosa of the maxillary antrum. It is one of the most common clinical conditions that affect contiguous structures such as the eyes and maxillary teeth and is among the medical entity that can present both to the Dental Surgeon and the Head and Neck Surgeon.² Chronic maxillary sinusitis may present with post nasal drip, nasal stuffiness, headache, toothache, heaviness of the affected side, pain which may radiate to the head and neck, tenderness and unilateral swelling of the cheek, buccal sulcus or palate, eyes or nose.^{3,4} These symptoms are also the presenting features of acute apical periodontitis (AAP) a condition that commonly affects the teeth.⁵ Chronic Maxillary Sinusitis can therefore be a diagnostic dilemma when it presents to the dentist. When chronic maxillary sinusitis become infected⁶, pus can spread to contiguous structures including the eyes with resultant periorbital abscess, orbital abscess and blindness.^{6,7} The precise cause of maxillary sinusitis is unknown but is thought to due to one or more host or environmental factors such as allergens, toxins e.g smoking, microbial agents including fungi and bacteria, defects of the immune systems including innate and adaptive components of the immune system.⁸ The numerous etiologic factors in chronic maxillary sinusitis have led to the proposal of a number of hypotheses, each describing a central role for one or more aspects of these factors.⁸ Maxillary sinusitis could also be of dental origin including but not limited to marginal periodontitis, periapical cyst, and periapical granuloma.⁹ Oroantral communication that may follow forceps extraction as a complication could also result in maxillary sinusitis if left untreated.¹⁰

The prevalence of maxillary sinusitis in United State of America ranges from 13% to 17%¹¹ while the reported prevalence in Europe is 10.9%.¹² In Nigeria, the prevalence of chronic maxillary Sinusitis is about 7.3%.¹³ Mehra and Jeong¹⁴ reported that odontogenic etiology accounted for 10-12% of cases of maxillary sinusitis. Maxillary sinusitis could occur in individuals without an underlying dental condition or it could be present in individuals with an underlying recognizable dental condition as in periapical cyst or oroantral communication.^{8,9} Maxillary sinusitis affects the pseudostratified columnar epithelium lined mucosa of the maxillary antrum. It can become

secondarily infected, especially in medically compromised patients with late presentation, and spread to involve the various bony walls of the antrum causing osteomyelitis. The infection can also spread to involve the orbit and the brain in some cases, causing orbital abscess and meningitis in some cases.^{3, 4} Studies have reported a significant difference in distribution of maxillary sinusitis between sexes, the females being more significantly affected than males.¹⁵⁻¹⁷ The average of patients affected by chronic maxillary sinusitis is between the 30 and 50 years.¹⁷ Inflammatory/infective lesions of the Maxillary sinus constitutes 12% of all sinus lesions in patients visiting the Ear, Nose and Throat and Oral Pathology/Medicine clinics in the University of Benin Teaching Hospital, Benin City, Nigeria.¹⁸

The clinical diagnosis of maxillary sinusitis is based on both clinical suspicion on presentation and sinus related radiographs. These radiographs include occipitomental 15° and 45°, orthopantomogram (OPG), oblique lateral views. These views may reveal features such as a change in the radiolucency of part or whole sinus as well as signs of destruction of the bony walls especially in very late presentation. Advanced imaging such as the computerized tomograph (CT) and magnetic resonance imaging (MRI) may become necessary where a broader and clearer view is required. Antroscopy may be carried out for direct visual inspection of the sinus and for biopsy of the antral tissue.^{3, 4, 6}

There are many treatment options of chronic maxillary sinusitis, including medical therapy and sinus surgery. These treatment options depend on the severity of the disease, the age and general health of the patient.¹⁵ Chronic maxillary sinusitis can be treated by a combination of oral antibiotics, decongestants inhalational and per oral, oral or topical nasal steroids. The aim of medical therapy is to achieve reduction in mucosal oedema, promote sinus drainage and eradicate infections that may be present.^{1, 3, 4} Surgical evaluation and management may be necessary where medical therapy has failed and in cases where there are orbital and intracranial complications. Immunosuppressed patients and paediatric patients with chronic maxillary sinusitis may also require surgery, depending on the severity of the disease. Antral wash out, endoscopic maxillary antrostomy, Caldwell-Luc procedure and inferior meatal antrostomy are some of the surgical procedures that could be done to manage chronic maxillary sinusitis. Surgical procedures help to

improve drainage and correct any anatomic aberrations in the sinus.^{3, 19} Caldwell-Luc procedure is, however, a more extensive procedure with potential complications especially in debilitated patients.²⁰ In cases where there are orbital and intracranial complications, referral to the Ophthalmologist and Neurosurgeon respectively will be necessary for evaluation and management. The ophthalmologist may need to carry out incision and drainage in cases of periorbital abscess or evisceration in cases of globe rupture. The neurosurgeon may also need to carry out a craniotomy if there is cerebral abscess.^{4, 21, 22}

Literature review did not reveal any report of maxillary sinusitis complicated by right orbital abscess with ruptured globe following tooth extraction of a single tooth in patients. This article hereby reports a case of maxillary sinusitis complicated by right orbital abscess with ruptured globe following tooth extraction of a single tooth in patients.

Case Report

A 70-year-old non-compliant diabetic female trader presented with a 4-week history of a throbbing pain in the right eye with associated impaired vision and disturbance of general daily activities. Five days prior to presentation, the pain was associated with swelling of right lower eyelid and cheek. There was associated pus discharge from the right lower eyelid. Patient also complained of regurgitation of fluid from the nasal cavity. There was a history of forceps extraction of a carious upper right 1st premolar in a private dental clinic, 8 weeks prior to presentation.

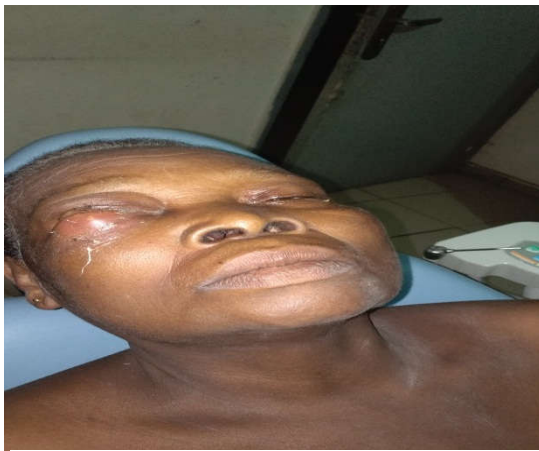


Fig.1: Periorbital swelling of the right eye with pus discharge from the right lower eye lid

Patient gave a history of nasal congestion and post nasal drip of over one year before extraction and pain from the culprit tooth which disturbed patient mastication and sleep.

Clinical examination by the Ophthalmology, Head and Neck Surgery and Dental teams revealed periorbital swelling of the right eye with pus discharge from the right lower eye lid (Figure 1). There was also rupture of the globe with crystalline lens extruding. There was obvious facial asymmetry with swelling of the right cheek. Intraorally, there was oroantral communication from the site of extraction of the 1st premolar with pus discharge from the fistula (Figure 2). There was also pus discharge from the retropharyngeal space.

Computerized Tomographic (CT) Imaging revealed Air-fluid level, mucosal thickening, sclerotic, thickened bone of the right maxillary sinus (Figure 3) Patient was admitted into the ward and consult sent to the physician for optimization of her fasting blood sugar level, which was 278mg/dl on presentation. Evisceration of the right eye was carried out along with incision and drainage of the right eyelid and buccal space. Intravenous ceftriaxone 1g daily, intravenous metronidazole 500mg 8 hourly, intramuscular gentamicin 80mg 8 hourly, eusol A&B dressing twice daily, paracetamol per oral 1g 8 hourly, menthol crystals steam inhalation twice daily, Diazepam 5mg nocte were prescribed for the patient. Inferior meatal antrostomy with antral washout was carried out by the Head and Neck Surgeon 2 weeks after. Following surgery, patient was placed on per oral Tavanic 500mg once daily, metronidazole 400mg 8 hourly, vitamin c 100mg



Fig.2 Site of extraction of the 1st premolar with oroantral communication

8hrly, guaifenesin/pseudoephedrine 25mg nocte, diclofenac potassium 50mg twice daily and menthol crystals steam inhalation twice daily. Patient was discharged home on medications and was reviewed every week. 4-week review of the patient

DISCUSSION

Chronic maxillary sinusitis is thought to occur due to one or more host or environmental factors¹. The authors have reported maxillary sinusitis of dental origin.^{9, 10, 14} Roots of the upper 1st premolar, upper 2nd premolar, upper 1st molar, upper 2nd molar and upper 3rd molar sometimes project into the maxillary sinus, depending on their sizes. Forceps extraction of these teeth, when required, can lead to a tear in the mucosa of the maxillary antrum which may heal spontaneously or lead to oroantral communication that may or may not be a predisposing factor for maxillary sinusitis.

Pain from background chronic maxillary sinusitis can radiate to the upper teeth which may cause the dentist to erroneously extract the teeth. Such extractions may lead to oroantral communication, and even exacerbation of the sinusitis. We hypothesize that the patient could have had chronic maxillary sinusitis prior to her presentation to the dental practitioner. The oroantral communication that followed the extraction of the tooth in this patient led to an exacerbation of the sinusitis.

Diabetes has been known to increase the susceptibility to infection on account of reduced immunity and hyperglycaemic environment which favors the growth of bacteria.²³ Chronic maxillary sinusitis can therefore become secondarily infected in the presence of elevated blood sugar level that characterizes Diabetes. The superimposed infection of the sinusitis could lead to retrograde spread to the periorbital region with consequent rupture of the globe of the eye, since the roof of the sinus is the floor of the orbit. In this reported case, the patient is a known diabetic patient that is non-compliant with her medication. The fact that the patient is an uncontrolled diabetic patient contributed to the onset and spread of the infection from the maxillary antrum to the periorbital region.

The failure of the dental practitioner to establish whether or not the patient had inflamed sinus or even determine the relationship of the roots of the tooth to the sinus prior to extraction may have led to the oroantral communication. In this reported case, the

postoperatively showed marked closure of the oroantral fistula, disappearance of swelling and cessation of pus from all points of previous discharge. Fasting blood sugar level was 115mg/dl (Figure 4).

extraction was carried out in a private dental clinic where the expertise of the practitioner could not be ascertained. Oroantral communication, bacterial infection and defects of the immune systems are among cited possible etiologic factors for chronic maxillary sinusitis in the literature.^{1, 8, 9}

When considering chronic maxillary sinusitis following forceps extraction in patients, it is therefore important to exclude medical compromising conditions like diabetes mellitus during history taking. The diagnosis in this report was based strictly on the history, clinical findings and radiologic findings.

It has been stated that chronic maxillary sinusitis is most prevalent between the ages of 30 years and 50 years.¹⁷ In this report, the patient was 70 years which was outside the most prevalent age group. Studies have indicated that the females are more significantly affected than males by chronic maxillary sinusitis.¹⁵⁻¹⁷ and in this report, our patient was a female. It appears that chronic maxillary sinusitis resolves with treatment and the observation in this report is therefore consistent with the findings in documented literature.^{3, 4, 19, 21, 22}

CONCLUSION

Severe orbital complications of chronic maxillary sinusitis can be triggered by forceps extraction of maxillary premolars and molars especially in a medically compromised patient. The authors hereby recommend the following: Ensure adequate medical and dental evaluation of patients before forceps extraction; all medically compromised patients must be optimized before forceps extraction as well as the need for multidisciplinary management of medically compromised patients with dental diseases

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