ORIGINAL RESEARCH PAPER
Volume - 13 | Issue - 07 | July - 2024 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

COMPLICATIONS OF ACUTE RHINOSINUSITIS IN TERTIARY CARE CENTRE -A CASE SERIES

Otorhinolaryngology

Dr. Aishwarya M Tamne* Senior Resident, Department Of Ent, Dr D Y Patil Medical College & Research Institute, Kolhapur, Maharashtra, India. *Corresponding Author

Dr.Rajashri S Mane HOD, Department Of Ent, Dr D Y Patil Medical College & Research Institute, Kolhapur, Maharashtra, India.

ABSTRACT

Orbital complications account for 7.8% (0.2%-26.7%) of all acute rhinosinusitis cases. Successful treatment requires a combination of surgical and medical management. Although orbital involvement is relatively common, reports on optic neuropathy and acute vision loss are limited. Herein, we present a series of 6 patients who presented with orbital swelling as the chief complaint. All 6 patients were otherwise healthy with extensive nasal discharge on endoscopic nasal examination.1 of the 6 patients had CRVO. All patients underwent endoscopic sinus surgery with orbital decompression and were followed up postoperatively by both ENT and ophthalmology services with endoscopic and radiologic evaluation. Prompt diagnosis and early medical and surgical intervention are warranted to prevent complications in patients with acute rhinosinusitis with orbital extension.

KEYWORDS

Acute rhinosinusitis, Orbital complications, Orbital abscess, Preseptal cellulitis, Postseptal cellulitis, Subperiosteal abscess,mucocele.

INTRODUCTION

Rhinosinusitis is the inflammation of nose and the paranasal sinuses characterized by 2/more symptoms ,one of which should be either nasal blockage/obstruction/congestion/discharge(anterior/posterior nasal drip) with/out facial pain/pressure, with/out reduction of sense of smell.

The most common causative pathogens for acute rhinosinusitis (ARS) are viruses like rhinovirus, coronavirus, and adenovirus, along with bacterial and fungal organisms. It can affect children younger than 15 years and most commonly adults between 25 to 64 years[1]

The paranasal sinuses are closely related to the orbit, the lateral wall of the ethmoidal sinus is the lamina papyracea , which is also the "paperthin" medial wall of the orbit [2].The floor of the orbit forms the roof of the maxillary sinus . The frontal sinus sometimes also extends into the roof of the orbit[3].It can be classified into acute, subacute , and chronic on the basis of duration of symptoms.Any of these classes can give rise to complications, It is estimated that 3% of sinusitis cases will progress to orbital cellulitis being secondary to sinusitis.

Table 1: Complications of Rhinosinusitis

Orbital	Intracranial	Bony	Chronic
Preseptal cellulitis (50%)	Sub dural empyema (38%)	Osteomyelitis & Pott's puffy tumour	Mucocele & pyocele
Postseptal cellulitis or orbital cellulitis without abscess (35%)	Intracranial abscess (30%)		
Subperiosteal abscess (15%)	Extradural abscess (23%)		
Orbital abscess (<1%)	Meningitis (2%)		
Cavernous sinus thrombosis	Cavernous or sagittal sinus thrombosis (2%)		

Mucocele is an epithelium lined, mucus filled sac within one of the PNS with expansion of the sinus cavity and remodeling of the sinus walls. It is formed secondary to obstruction of the outflow tract of the involved sinus inflammatory process (IL1, TNF)within the sinus.

Table 2: Chandler stages.

Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Preseptal cellulitis	Postseptal cellulitis or orbital cellulitis without abscess	Subperiosteal abscess	Orbital abscess	Cavernous sinus thrombosis/abscess
Inflammation does not extend beyond the orbital septum (where the medial orbital periosteal reflection attaches to the medial eyelid at the tarsal plate).	Inflammation extends into the tissues of the orbit.	There is abscess formation deep to the periosteum of the orbital bones, typically at the lamina papyracea from ethmoid sinusitis.	There is abscess formation within the orbit which has breached the periosteum.	The inflammatory process has extended into the cavernous sinus which thromboses and may progress to abscess formation.

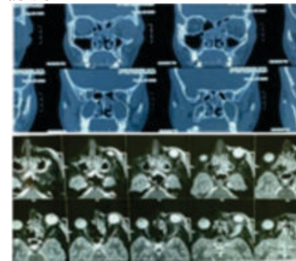
Most common in Frontal sinus. The proximity of mucoceles to the brain may cause morbidity and potential mortality because of intracranial and intra orbital spread, if left without intervention[4,5]

MATERIAL AND METHODS

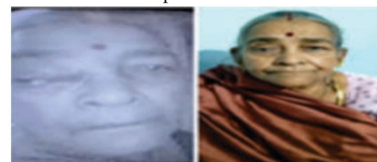
A retrospective observational study done for period of 1year from December 2022 to December 2023 in our institute with review of medical records of patients having orbital involvement due to acute rhinosinusitis.

Table 3: Cases Description

CT PNS- Pansinusitis

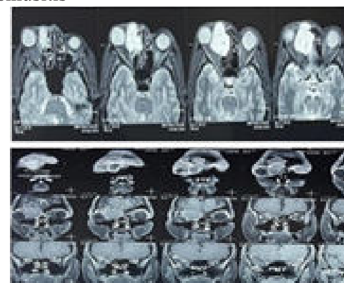


Case 1 : MRI ORBIT-Left Subperiosteal Abscess



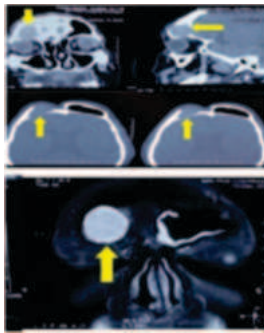
Preop **Postop**

Case 5 : MRI PNS with Contrast -Benign lesion like mucocele with Right frontal sinusitis



Case 6: CT-PNS- a well defined Hypodense, soft tissue lesion in the Right frontal sinus with erosion of the anterior, posterior wall and floor

of the Right frontal sinus .



MRI PNS- a well circumscribed, cystic lesion in the Rt frontal sinus appearing isointense on T1W hyperintense on T2W.

RESULTS

There were 6 patients, 3 male and female each of age group 17-72 with the mean age of 44.the most common complication is orbital cellulitis ,other rare complication include mucopyocoele.once the diagnosis was made,most patients were put on combination on high dose iv antibiotics with FESS and required ophthalmological intervention was performed.there was no significant postoperative mortality or morbidity.

DISCUSSION

Complications of rhinosinusitis are more accentuated in children and adolescents because of their thinner, more porous bony septa and sinus walls, open suture lines and larger vascular foramina ,delayed diagnosis in all age groups is a threat to both vision and life[6]and are therefore regarded as medical emergencies.An infection from sinuses can easily spread to the orbit and to the intracranial cavity as these anatomical structures are very closely interrelated. The most common complication of sinusitis is orbital cellulitis followed by intracranial complications like meningitis, brain abscess and cavernous sinus thrombosis. Other complications include mucocele, pyelocele, osteomyelitis, facial cellulitis and subperiosteal abscess[7].Nwaorgu et al. in a retrospective review of 90 patients with orbital cellulitis, found sinogenic origin in 57 % patients. Similarly Choudhary et al. in a study of 218 patients of orbital cellulitis, found sinusitis as the most common predisposing factor[8]. In our study 50 % patients presented with subperiosteal abscess as a complication of acute infective rhino sinusitis.

The most common offending sinus reported was frontal sinus followed by ethmoid and maxillary sinuse[9].However in our study, ethmoid sinus was the most common offending sinus (67 %).Orbital complications have been identified by Ogunleye et al to occur in 41% of cases of paranasal sinusitis [10]Wulc et al reported that sinusitis was responsible for orbital infection in 75-78% of a large series of patients with orbital cellulitis[11]

The incidence of intracranial complications of acute rhinosinusitis was reported to be between 3% and 17% in various studies[12].Mucocele sometimes get filled with pus as a result of chronic infection and then are referred to as mucopyocele. 60-89% occur in frontal sinus.May form at any age with equal male:female ratio.Common isolates in a mucopyocele are S. aureus, H. streptococci and gram neg bacilli with anaerobic bacillis. 23.5% of patients develop recurrence after a mean interval of 4 years. Surgery is the only curative treatment.About 50% of patients presented with mucocele whereas the other 50% presented with orbital complication. Endoscopic debridement of the disease was the basis of treatment.According to Oxford et al. study with children who were admitted with complications of ARS, orbital cellulitis and orbital abscesses were the two most common complications accounting for 51 and 44 respectively[13] Furthermore, complication like subperiosteal abscess was seen the most among the cases in our study with the most common presentation being eye swelling. Frontal and sphenoid sinus involvement in ARS is associated with a high risk of developing intracranial complications. According to the literature, the sphenoid sinus is considered one of the main sources of intracranial complications, which can be a result of its contiguous location to the cranial cavity[14]

To conclude, the complications of acute rhino sinusitis are potentially life threatening. A high degree of suspicion is mandatory in patients with sinusitis not responding.

Table 3: Management Protocol

CONCLUSIONS

The complications may be life-threatening. the study indicates different management approach medically & surgically with great flexibility was the need of hour. rapid diagnosis & prompt surgical intervention are essential .prognosis of the disease is directly proportional to early diagnosis.To prevent permanent loss of vision, immediate &intense therapy is most important in orbital complication.Though Orbital complications of Acute Rhinosinusitis are common in paediatric age group we saw in adults also. Surgical drainage procedures along with necessary ophthalmological intervention in conjunction with aggressive medical management remain the standard of care for this condition to achieve a good prognosis and visual outcome.

Acknowledgement: We acknowledge our hospital for using the medical records.

Declaration of patient consent:
The authors attest that they have all necessary patient permission paperwork on file. The patient has provided his permission in the form for his photos and other clinical data to be published in the publication.

Conflict Of Interest :
The authors declare that they have no conflict of interest.

Table 3: Cases Description

SR NO.	*AGE/SEX*	*CLINICAL PRESENTATION*	*DNE FINDINGS*	*OPHTHALMOLOGY FINDINGS*	*MRI ORBIT REPORT*	*CT PNS REPORT*	*HPR REPORT*	*TREATMENT*
1	17/M	Periorbital Oedema & Pain in left eye since 2 days.H/O of Fever, cough, cold along with headache since 2 days. B/L frontal & ethmoid tenderness	DNS to L, Congestion of Nasal mucosa,Purulent discharge present above from L middle meatus	Left eye Proptosis +, chemosis + , vision 6/36,restricted eye movement ,Right eye normal.	Left Subperioseteal abscess	Pansinusitis	Non Specific Inflammation	Left Subperiosteal Drainage under LA f/b Bilateral Functional Endoscopic Sinus Surgery under GA
2	47/M	Periorbital Oedema and Pain in left eye since 7 days. H/O of cough & cold along with headache since 4 days.Nose- Congestion	bilateral purulent discharge + above from middle meatus	left eye periorbital oedema with matting of eyelids & conjunctival chemosis	Left Subperiosteal abscess	Pansinusitis	Non Specific Inflammation	Left Subperiosteal Drainage under LA f/b Functional Endoscopic Sinus Surgery under GA

		of Nasal mucosa, Purulent discharge +, b/l frontal & ethmoid tenderness		+,restricted eye ,movement Vision 6/24 ,right eye normal.				
3	55/F DM	periorbital oedema & pain in left eye since 2 days.H/o fever ,headache & cold for last 8 Days Nose – Congestion of Nasal mucosa, Purulent discharge +,b/l ethmoid tenderness	bilateral purulent discharge + above from middle meatus	Left eye periorbital oedema + & conjunctival chemosis +.Vision absent,Right eye normal.	Orbital and periorbital cellulitis	Orbital cellulitis	Non Specific Inflammation	Functional Endoscopic Sinus Surgery under GA
4	60/F	c/o Nasal obstruction since 15 days,Intermittent non foul smelling mucopurulent discharge L side o/e –swelling over L canthal region ,single 2*2 cm,soft,tender,no discharge/sinus/pus, non flucatuant, no signs of inflammation	left synechia+ over lateral wall with polypoidal mucosa	Normal	-	Chronic sinusitis with sinonasal polyposis	Sinonasal polyposis with frontal mucocele	Functional Endoscopic Sinus Surgery under GA
5	68/F DM	**c**/o swelling above the R medial canthal region since 1 month ,Nasal discharge & pain around the R eye. o/e –swelling over R canthal region ,single 3*3 cm,soft,tender,no discharge/sinus/pus, non flucatuant,no signs of inflammation	DNS to L with spur, Right nasal cavity normal	protusion of eyeball+, ophthalmoplegia+, medial movement restricted, vision normal	Benign lesion like mucocele with Right frontal sinusitis	Chronic sinusitis	Right Frontoethmoidal Pyocele	Functional Endoscopic Sinus Surgery under GA
6	72/M DM,HTN	nasal obstruction ,headache since 15 days	polypoidal mucosa in the Rt middle meatus.	Normal Single swelling over forehead just above the Rt eyebrow. 3x3 cm, smooth surfaced, soft in consistency, non tender, non mobile and translucent . Skin over the swelling - normal, no local rise of temperature. frontal tenderness+	a well circumscribed, cystic lesion in the Rt frontal sinus appearing isointense on T1W hyperintense on T2W	a well defined hypodense, soft tissue lesion in the Right frontal sinus with erosion of the anterior, posterior wall and floor of the Right frontal sinus.	Right Frontal Mucopyocele	Functional Endoscopic Sinus Surgery under GA

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