

## Case Report

# Rare complications of sinusitis: case series

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### ABSTRACT

Sinusitis complications affecting multiple sites are very uncommon in the antibiotic era. However, a significant proportion of patients (5-40%) suffering from acute sinusitis can have these complications mostly due to the delayed diagnosis of the disease. Patients can have variable presentations according to the site and extent of the infection. All the patients were subjected to thorough clinical examination, ophthalmological evaluation and radiological evaluation. Computed tomography of paranasal sinuses both axial and coronal planes, MRI in selected cases and histopathology are the study tools used in this study. All the patients in this study received appropriate medical and surgical treatment and done a follow up evaluation every month. A thorough clinical and radiological evaluation along with early management of the disease can prevent complications of sinusitis and further deterioration of the disease to a larger extent.

**Keywords:** Sinusitis, Intracranial complications, Intraorbital complications

### INTRODUCTION

Complications of paranasal sinus infection involve the orbit and periorbital region commonly. Because of infrequent intracranial extension of sinus disease, the clinician may be unfamiliar with the evaluation and management of these potentially devastating complications. Despite recent advances in treatment and diagnostic imaging, intracranial extension is often not recognised early enough to prevent delays in treatment aimed at reducing morbidity and mortality.<sup>1,2</sup>

If not diagnosed early and treated adequately, due to close proximity of the orbit with ethmoid, maxillary, frontal and sphenoid sinuses, it can lead to the spread of infections through the neurovascular foramina via congenital and acquired bony dehiscence and indirectly through the valve less ophthalmic veins draining the sinuses and orbit as a result of thrombophlebitis and embolism. A paper thin bone separating the ethmoid sinus and orbit, namely lamina papyracea, the erosion and

destruction of the same, provides the most common pathway for the contiguous spread of sinus infection to the orbit<sup>3</sup>.

Timely treatment of intracranial complications is a requisite lest they can progress to life-threatening complications such as optic neuritis, cavernous sinus thrombosis or intracranial complications.<sup>4,5</sup> Presentations vary based on the anatomical sites and the degree of involvement. Along with a proper history and clinical examination, extensive radiological evaluation (computed tomography [CT] scan or magnetic resonance imaging [MRI] of the paranasal sinus and brain) is always mandatory in patients with suspected complications. The first line of treatment for all complicated sinusitis is Conservative treatment. Progressive disease, unresponsive to medical treatment is managed by endoscopic/open surgical drainage.

Complicated sinusitis can lead to mucocele, meningitis, cavernous sinus thrombosis, osteomyelitis and orbital

complications. We describe the treatment and outcome in a series of eight patients diagnosed with sinusitis-related intracranial and intraorbital complications at our institution during one year period.

## CASE REPORT

### Case 1

A 50-year-old male with nil co-morbidities and farmer by occupation presented with dull throbbing continuous type of headache followed by swelling of forehead since one month, with no preceding history of trauma or fever. Systemic examination was within normal limits. Local examination revealed diffuse swelling in bilateral frontal and supraorbital regions with normal eye movements.

On investigating, total count and ESR was found to be elevated- 11260 cells and 81 mm/hr respectively with positive C-Reactive Protein of 24 mg/l. Diagnostic nasal endoscopy was within normal limits. Computed tomography of the paranasal sinus revealed soft tissue density in frontal sinus with ossification, cortical erosion, peri cranial soft tissue component and minimal intracranial extension suggestive of osteomyelitis or ossifying neoplasm.

Patient was managed conservatively with INJ Cefoperazone + Sulbactam (1.5 g) IV BD and INJ Metronidazole 400 mg i.v. TID for a week, following which he was taken up for biopsy of frontal bone under GA. Histopathological examination was consistent with diagnosis of acute osteomyelitis.

He was discharged with T. Ciprofloxacin 750 mg and T. Ornidazole 500 mg for 7 days. The patient had an unremarkable recovery.



**Figure 1: Pretreatment and posttreatment comparison.**

### Case 2

64-year-old male, with diabetes mellitus and Hypertension, diagnosed with TB meningitis on ATT since 2 months, presented with headache since 2 months,

diffuse not aggravated on bending forward and swelling over the left eye since 1 week. On examination, deviated nasal septum was noted to right. Systemic examination was within normal limits.

On investigating, total count was 13,300, ESR was 92, FBS-253, PPBS-307, HbA1C- 9.5. Computed tomography of paranasal sinuses showed soft tissue density in bilateral sphenoid and ethmoid sinuses with hyperdense area within. Minimal mucosal thickening noted in left maxillary and bilateral frontal sinuses. Deviation of nasal septum with bony spur to the right side noted.

Patient was taken for functional endoscopic sinus surgery under GA, left uncinectomy, left ethmoidectomy was done. Histopathological examination showed mucocele-sphenoid and ethmoid sinuses. Post op period was uneventful.

Patient was discharged with oral antibiotics. Follow up period was uneventful.

### Case 3

29-year-old male, presented with diffuse headache for 2 days, fever for 2 days. Systemic and local examination was within normal limits.

Investigations showed elevated counts of 11500, ESR of 32. Diagnostic nasal endoscopy showed deviated nasal septum to right with spur on the left almost impinging on inferior turbinate. Computed tomography of brain showed dehiscent inner table of frontal bone with mucosal thickening and fluid levels and pneumocephalus. Left subdural collection noted in the left frontal region measuring 5 mm in maximal thickness.



**Figure 2: Pus collection in frontal sinus.**

Computed tomography of paranasal sinus showed mucosal thickening in bilateral maxillary, ethmoid and sphenoid sinuses with soft tissue density in frontal sinus

left more than right with focal defect and thinning of inner table of frontal sinus with likely dehiscence, suggestive of pansinusitis. Patient underwent septoplasty with frontal sinus obliteration under GA. Post op period uneventful. Patient was discharged with oral antibiotics.



**Figure 3: Intraoperative picture of frontal sinus obliteration.**

#### Case 4

67 year old female patient presented with severe headache since 4 months. History of blurring of vision+, diplopia, watering of eyes since 1 month. Known case of diabetes mellitus, hypertension and ischaemic heart disease. nasal examination– deviated nasal septum to left, right frontal sinus tenderness present. Ear and throat examination– normal. Orbital movements– normal. Diagnostic nasal endoscopy– mucocoele in right frontal sinus. Computed tomography– soft tissue thickening noted in right frontal sinus– Mucocoele. FESS + Mucocoele excision was done under GA. Postoperative period uneventful and patient was symptomatically better.



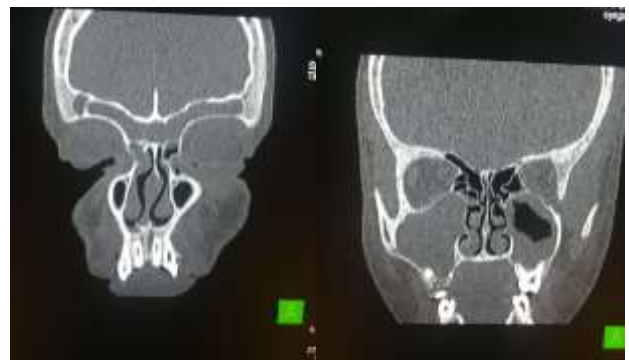
**Figure 4: CT PNS showing mucocoele in right frontal sinus.**

#### Case 5

A 50-year-old male, known case of diabetes mellitus on insulin presented with complaints of diffuse headache with post nasal drip for 1 month, fever with cough for 10 days and bilateral eye pain with edema since 7 days. Local examination revealed thick mucopurulent discharge in right nasal cavity. Edema of the right upper lid and medial canthus was noted, however eye movements were within normal limits.

On investigating, ESR was elevated with a value of 100. Computed tomography was suggestive of right cavernous sinus thrombosis with filling defect in anterior superior sagittal sinus. Diagnostic nasal endoscopy revealed inferior turbinate hypertrophy, mucopurulent discharge in inferior meatus and middle meatus with a polyp in middle meatus on the right, with mucoid discharge in inferior meatus and middle meatus in the left side.

Patient was taken up for Functional endoscopic sinus surgery under GA. Right uncinectomy, middle meatalantrostomy and posterior ethmoidectomy was done. The polyp was removed. Lamina papyracea was removed and edematous fluid in pre-septal space was drained. Immediate postoperative period was uneventful. Pus was sent for culture sensitive and reported as scanty growth of pseudomonas aeruginosa. On post-operative day 1, patient developed multiple erythematous papule in the right half of forehead. Tzanck smear was diagnostic of herpes zoster and patient was treated with T. Acivic 800 mg. Patient was discharged 7 days later with oral antibiotics and insulin.



**Figure 5: CT PNS showing pansinusitis.**

#### Case 6

14 year old child presented with headache in the frontal region since 15 days, fever with chills and altered sensorium since 3 days. Associated with nasal block. On examination- Patient was drowsy, neck rigidity present. ENT examination– normal. Blood investigations TC– 25,800. Lumbar puncture done– pyogenic meningitis. CSF culture– no growth.

CT Brain + PNS- Pansinusitis, epidural abscess with meningitis with small infarcts– secondary to vasculitis. IV antibiotics and mannitol was started. Child underwent FESS – pus drained and sent for culture & sensitivity. Pus culture– *Klebsiella*.

Repeat scan– mucosal thickening reduced in all paranasalsinuses. Postop period was uneventful and child was discharged.

## INTRAORBITAL COMPLICATIONS

### Case 1

A 40-year-old male, known case of diabetes mellitus and hypertension, post functional endoscopic sinus surgery and antral wash done 2 weeks prior to presentation in our OPD, complaints of blurring and diminution of vision post-surgery and headache more on the right side with facial pain for 3 weeks. Systemic and local examination was within normal limits.

Investigations revealed FBS– 178 mg/dl, RBS– 178 mg/dl and HbA1C of 17.4 and ESR 99. Diagnostic nasal endoscopy revealed clots over the right ethmoids and pus was noted in the right middle meatus. Pus was sent for culture sensitivity, which showed MRSA isolate. Computed tomography showed absence of bulla ethmoidalis, middle turbinate, uncinata process (post op status) Mucosal thickening in the right maxillary sinus extending to posterior ethmoid sinus with erosive changes along the bony margins of right maxillary sinus. Minimal mucosal thickening in right sphenoid and left ethmoidal sinuses, suggestive of residual disease. Patient was clinically diagnosed with mucormycosis. Patient underwent FESS under GA. Post op period was uneventful. Patient was started on Inj amphotericin and his condition improved symptomatically. He was discharged with oral antibiotics. Patient recovered during the course of stay in the hospital.



**Figure 6: Case of preseptal cellulitis.**

### Case 2

28 year old female presented with swelling over right upper eyelid since 8 days. Associated with headache,

unilateral since 3 days. Ear, nose and throat examination– normal. Eye examination - right eye– periorbital edema and ecchymosis + Nasal endoscopy– DNS to left with caudal dislocation to right. US Gorbit– Soft tissue changes with surrounding subcutaneous edema in periorbital region involving the lateral aspect of eyelid on right side. CT PNS– preseptal cellulitis with mild extension into post septal region. Patient was managed conservatively and was symptomatically better by 5<sup>th</sup> day.

## DISCUSSION

Sinusitis is a relatively common problem encountered mostly by otorhinolaryngologist in the recent days. Although the incidence of complicated sinusitis has been on the decline recently with the wide use of broad spectrum antibiotics, it is still associated with well-known complications including intraorbital or intracranial abscesses.<sup>6</sup> Orbital complications being more frequent, because of the close anatomical relationship between the orbital content and the paranasal sinuses. Blood vessels traversing through the lamina papyracea create an easily accessible pathway in the spread of infections from the paranasal sinuses to the orbit.<sup>7</sup> In contrast, intracranial complications are very rare, with a incidence of about 4% in patients affected with acute or chronic sinusitis, due to retrograde thrombophlebitis or because of the direct spread of the disease from the osteomyelitic bones of the paranasal sinuses to the posterior wall of the frontalsinus.<sup>8-11</sup> A thorough history and clinical examination of the patient is an important step for all cases of suspected acute/chronic sinusitis and an extensive radiological investigation including both CT scan and MRI scan is often advised.

Irrespective of the site and the severity, medical treatment is always the first line of treatment offered to patients with complicated sinusitis. Surgery is indicated, provided the condition does not respond to conservative management. Due to the advancement of rigid endoscopes, orbital complications are managed effectively by an intranasal endoscopic approach. But most of the intracranial complications are successfully managed by medical treatment, requiring long-term drug therapy.<sup>12</sup>

Even though intraorbital or intracranial complications can be seen in patients with sinus complications, multi-site involvement can result in life-threatening complications. Highlighting the need for early intervention to reduce unwanted complications.

## CONCLUSION

Extension of the disease pathology and variations in the local anatomy are the major factors influencing the occurrence of complications. Pre-operative imaging of the patient in order to understand the extent of the disease and anatomical variations, proper knowledge of anatomy, identification of landmarks, preservation of normal sinus

mucosa, intra operative tissue handling, periodic saline irrigation are the major factors which can definitely reduce the occurrence of complications and improve the patient outcome. Complications of sinusitis especially intracranial and intraorbital complications can be prevented to a large extent if they are dealt at the earliest.

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