

Clinical Presentation and Outcome of the Orbital Complications Due to Acute Infective Rhino Sinusitis

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Abstract To describe the clinical presentation and visual outcome of patients with orbital complications of acute infective rhino sinusitis. This is a retrospective case series of patients diagnosed with of orbital involvement due to acute infective rhino sinusitis, who presented to eye OPD between July 2007 and July 2009. The medical records were reviewed with particular emphasis on clinical presentation and management. Twelve patients with an average age of 40.3 years (range, 14–65 years) were studied. The most common presenting symptom was diminution of vision (66.6 %) followed by proptosis, ptosis (33.3 %) and globe displacement (16.6 %). The most common orbital complication noted was orbital cellulitis (83.3 %). Majority of the patients had multiple sinus involvement. Ethmoid sinus was the most common sinus involved (91.6 %). Surgical intervention was required in 75 % of patients. Three patients (25 %) were managed conservatively by intravenous antibiotics. This series highlights the risk of orbital involvement and visual loss in patients with para nasal sinusitis. Early diagnosis, aggressive medical and prompt surgical treatment by multidisciplinary approach can successfully treat the complications.

Keywords Acute rhino sinusitis · Visual loss · Orbital cellulitis · Paranasal sinuses

Introduction

The proximity of the eye to nose and paranasal sinuses makes it vulnerable to be involved in the diseases of this area. An infection from sinuses can easily spread to the orbit, either by direct extension through the bone or indirectly through valveless venous plexus surrounding the orbit and the sinuses [1].

The incidence of orbital complications due to paranasal sinusitis has been reported by many authors at between 21 and 90 % [1–4]. Orbital infection is the most common complication of sinusitis [3–5].

This article represents a retrospective chart review of patients with orbital involvement due to sinusitis from a tertiary academic teaching centre in the central part of India.

Methods

This is a retrospective review of medical records of patients with diagnosis of orbital involvement due to rhino sinusitis, who presented to eye OPD between July 2007 and July 2009. The medical records were analyzed with particular emphasis on symptomatology, investigations (including imaging, microbiological and histopathological reports) treatment and outcome.

Results

There were eight female patients and four male patients in age group of 14–65 years with mean age of 40.3 years. The

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most common presenting symptom was diminution of vision (66.6 %) followed by proptosis (Fig. 1a), ptosis (33.3 %) and globe displacement (16.6 %) (Table 1). The most common orbital complication diagnosed was orbital cellulitis (83.3 %) (Fig. 1b). Other complications included maxillary osteomyelitis with facial cellulitis (Fig. 2a, b), mucopyelocele with globe displacement (Fig. 3a, b) and orbital apex syndrome. Majority of the patients had multiple sinus involvement. Ethmoid sinus involvement was seen in 91.6 % of patients.

Bacteriological studies were done in all patients (Table 1). The organisms were identified and cultured in ten patients (83.3 %). In two patients there was no growth reported. Among culture positive cases *Staphylococcus aureus* was cultured in four patients (33.3 %), *Streptococcus pneumoniae* in two patients (16.6 %) and *Rizopus microsporum* in four patients (33.3 %).

Once the diagnosis was made, most of the patients were put on a combination of high dose intravenous broad spectrum antibiotics therapy (amoxicillin and clavulonic acid, ceftriaxone and salbactam) and metronidazole. In patients with rhino-orbital-mucormycosis, intravenous amphotericin-B was started and urgent radical debridement of sinuses was done. Functional endoscope sinus surgery was done in patients with bacterial sinusitis, when there was no improvement in symptoms and signs within 48 h (58.3 %). Patients with mucopyelocele were operated by external approach (16.6 %) and only three patients (25 %) were managed conservatively by intravenous broad spectrum antibiotics. There was no significant intraoperative or postoperative morbidity and no mortality.

Discussion

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 [4].

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 [6]. In our study 83.3 % patients presented with orbital cellulites as a complication of acute infective rhino sinusitis.

The most common offending sinus reported was frontal sinus followed by ethmoid and maxillary sinuses [7]. However in our study, ethmoid sinus was the most common offending sinus (91.6 %).

Fungal sinusitis is relatively uncommon. It is usually seen in immunocompromised and poorly controlled diabetes mellitus patients [1]. Our study too revealed the same observation. All patients with rhino-orbital-mucormycosis were poorly controlled diabetes mellitus patients.

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 to antibiotic therapy.

Fig. 1 **a** Clinical photograph showing proptosis with periorbital and facial swelling on left side. **b** CT scan axial image showing opaque ethmoid sinus with signs of periorbital inflammation on left side. **c** Clinical photograph of the same patient after treatment

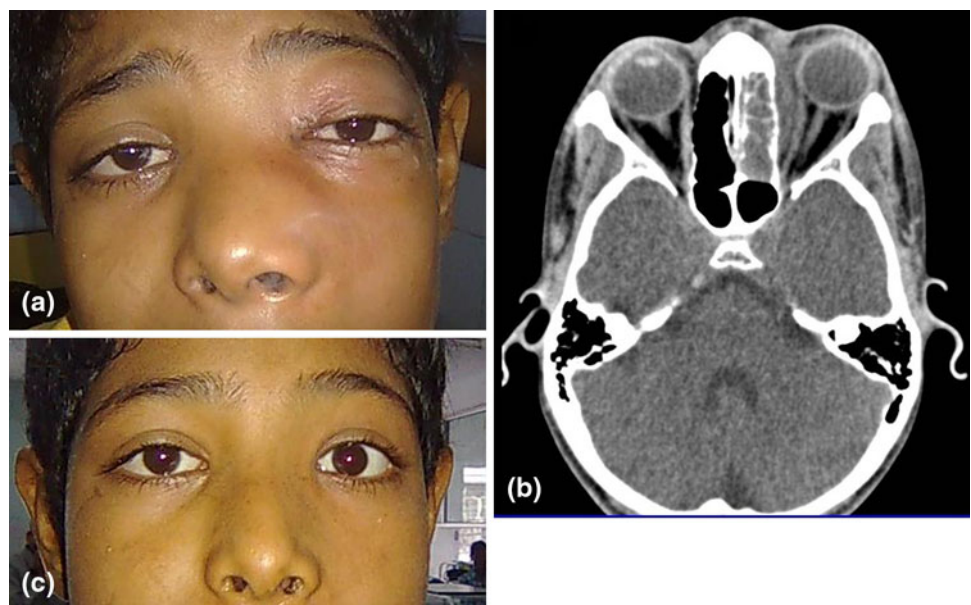


Table 1 Orbital complications of acute infective sinusitis—summary of clinical data

S. no.	Age/sex	Sinuses involved	Clinical presentation	Orbital complications	Pathogen isolated	Treatment given	Out-come
1.	45/F	Ethmoid, sphenoid maxillary	Periorbital swelling fever, headache unilateral visual loss	Orbital and preseptal cellulitis	<i>Staphylococcus aureus</i>	Endoscopic drainage of sinuses	Recovered
2.	38/F	Ethmoid	Periorbital swelling with proptosis	Orbital cellulitis	<i>Staphylococcus aureus</i>	I/V Amoxicillin clavulonic acid	Recovered
3.	49/M	Ethmoid, maxillary sphenoid	Unilateral ptosis with loss of vision	Orbital apex syndrome	<i>Rhizopus microsporum</i>	Radical debridement of sinuses, Ampho- B	Recovered
4.	28/F	Ethmoid, sphenoid	Headache, fever diminution of vision	Orbital cellulitis	No growth	I/V Cefotaxime salbactam, metronidazole	Recovered
5.	26/F	Ethmoid, maxillary, frontal	Fever, facial cellulitis pain	Orbital and facial cellulitis with osteomyelitis	<i>Streptococcus pneumoniae</i>	Endoscopic drainage of sinuses	Recovered
6.	56/M	Ethmoid, maxillary sphenoid	Unilateral ptosis with loss of vision	Orbital apex syndrome with orbital cellulitis	<i>Rhizopus microsporum</i>	Radical debridement of sinuses, Ampho-B	Recovered
7.	48/M	Maxillary, ethmoid	Unilateral ptosis with loss of vision	Orbital cellulitis with orbital apex syndrome	<i>Rhizopus microsporum</i>	Radical debridement of sinuses, Ampho-B	Recovered
8.	65/F	Frontal sinus	Proptosis with eye ball displacement with DOV	Mucopyelocele of frontal sinus displacing the eye ball	<i>Staphylococcus aureus</i>	Surgical excision of mucopyelocele	Recovered
9.	16/F	Ethmoid, maxillary	Unilateral ptosis with diminution of vision	Orbital cellulitis involving apex	<i>Rhizopus microsporum</i>	Radical debridement of sinuses, Ampho- B	Recovered
10.	45/F	Ethmoid	Proptosis, eye ball displacement with diminution of vision	Mucopyelocele of ethmoid sinus with globe displacement	<i>Staphylococcus aureus</i>	Surgical excision of mucopyelocele	Recovered
11.	14/M	Ethmoid	Fever, periorbital and facial swelling, proptosis	Orbital abscess	<i>Streptococcus pneumoniae</i>	Endoscopic drainage of sinuses	Recovered
12.	54/F	Ethmoid, maxillary	Fever, headache Periorbital swelling	Orbital cellulitis	No growth	I/V Cefotaxime salbactam metronidazo.	Recovered

Fig. 2 **a** CT scan coronal image showing opaque frontal ethmoid and maxillary sinuses on left side with bony destruction of floor and medial wall of orbit and inflammatory changes involving periorbital tissue. **b** Clinical photograph of the same patient showing cellulitis along lower eyelid. **c** Clinical photograph of the same patient after recovery

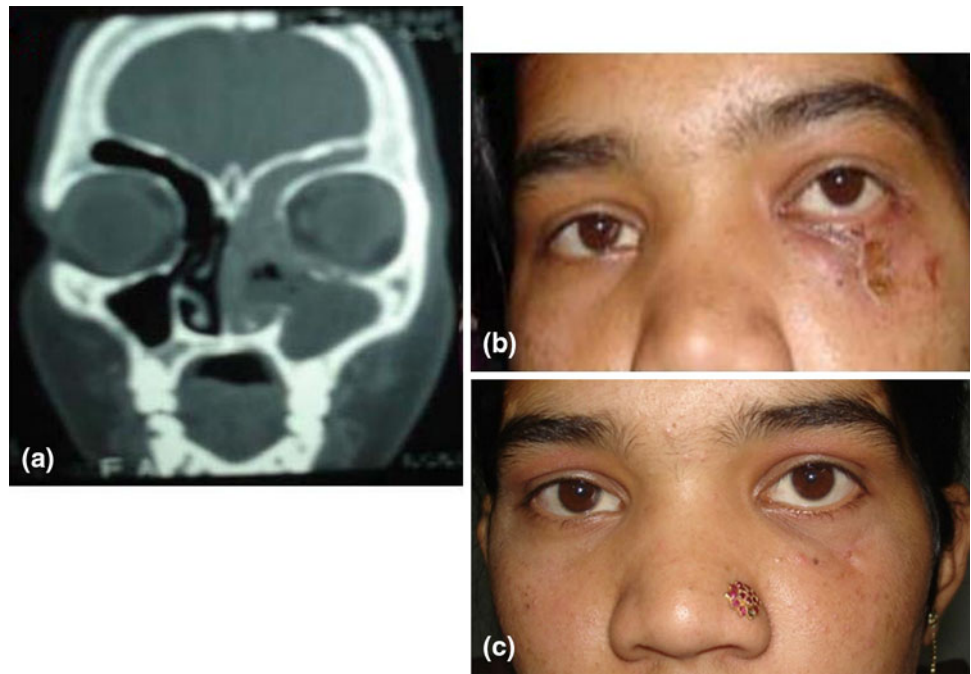
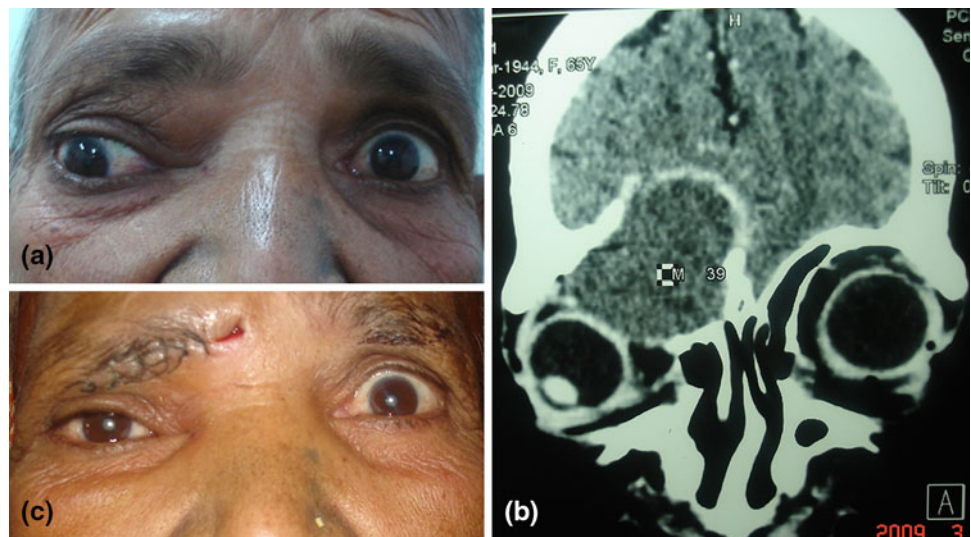


Fig. 3 **a** Clinical photograph of the patient showing proptosis with lateral displacement of eye ball on right side. **b** CT scan orbit showing mucopyelocele of right frontal sinus displacing the eyeball downwards and outwards. **c** Clinical photograph of the same patient after surgery



Early diagnosis, appropriate medical therapy and emergency surgical intervention by ophthalmologists, ENT surgeons and neurosurgeons offer a favorable outcome.

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