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Rhino-orbital Aspergillous sinusitis in Diabetes Mellitus–an aggressive opponent

KEYWORDS: Diabetes Mellitus, Aspergillosis, cavernous sinus thrombosis

Dr Supriya Barsode
Assistant Professor ,Department of Medicine, Bharati Vidyapeeth Deemed University, Medical College and Bharati Hospital,Pune.

Dr Arundhati Diwan
Professor and Head of the Department of Medicine, Bharati Vidyapeeth Deemed University,Medical College and Bharati Hospital,Pune.

Dr Rohan Patil
Junior resident second year, Department of Medicine. Bharati Vidyapeeth Deemed University, Medical College and Bharati Hospital,Pune.

Dr Gagan Jain
Junior resident third year , Department of Medicine. Bharati Vidyapeeth Deemed University, Medical College and Bharati Hospital,Pune.

ABSTRACT *The leading cause of invasive fungal infections are the Aspergillus and Candida organisms followed by the mucorales which are predominantly opportunistic infections. Rhizopusoryzae is the most frequently isolated species1.*

Though fungal infection of the nasal cavity is not very uncommon there is an increased frequency of fungi to invade and infect immunocompromised hosts . Fungal pansinusitis further complicated with cavernous sinus thrombosis is a dangerous complication.

Early diagnosis and urgent extensive debridement and systemic antifungal treatment is important to avoid a protracted or fatal outcome . Ocular motor palsies may recover within two months but visual loss may be permanent. Pansinusitis is an important differential diagnosis for acute visual loss , periorbital odema ,especially in uncontrolled diabetics2.

Case Report

We report a 65 year old male patient who came with complaints of pain in the right eye with reduced eye opening and watering of the same and severe right frontal headache which was insidious , ,progressive and throbbing in nature for two to three weeks. The pain was only slightly and temporarily relieved on taking medications. He had decreased vision in the right eye for fifteen days the nature being insidious and progressive with loss of vision within five or six days of onset. There is no history of redness of eye or trauma and diplopia .The patient also gave a history of mouth breathing but no prior history of snoring ,frequent colds, sneezing ,nasal obstruction and post nasal drip, giddiness or fever.He was a known case of Diabetes Mellitus on Injection Insulin for the past one year.His family history was non significant but personal history revealed a history of decreased appetite.

On general examination the patient was afebrile conscious oriented ,his pulse was 70 per minute and blood pressure was 160/90 mmhg. He had no lymphadenopathy ,pallor. On Ear nose throat examination there was no external abnormality and vestibule was normal, cold spatula test showed equal mist on both sides. There was tenderness on para nasal sinus on right side with deviated nasal septum to right with no congestion and no discharge. Posterior rhinoscopy was normal. Laryngeal crepitus was revealed on further examination. Post pharyngeal wall was normal and showed no congestion. On examination of the ear the tympanic membrane on both sided was retracted. Webers test was towards left and Rinnes test was bilaterally positive. Facial nerve was normal and there was no spontaneous nystagmus.

On examination of eye right eye opening had decreased and partial ptosis was present and external ophthamoplegia involving 3rd,4thand 5th cranial nerve. Congestion , redness of the eye was absent and infraorbital margin was regular however watering of the eye was present. The finger counting test was absent in the right eye.

His blood sugar levels were 379mg% and HbA1C was 10.6% indicating uncontrolled Diabetes Mellitus. His HIV status was negative.

A CT para nasal sinus with contrast disclosed a sphenoid mucocele on the right side(probably secondary to fungal sinusitis)causing destruction of its walls, involvement of the post ethmoid air cells with likely focal optic neuritis and cavernous sinus thrombosis on the right side.

Fig1: The CT para nasal sinus with contrast disclosed a sphenoid mucocele on the right side (probably secondary to fungal sinusitis).

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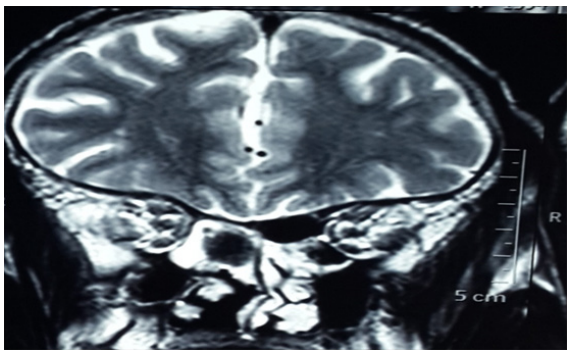
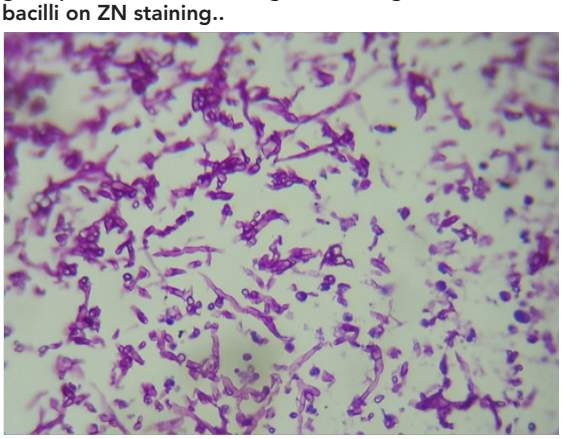
Fig2: The CT para nasal sinus with contrast disclosed a sphenoid mucocele on the right side causing destruction of its walls, involvement of the post ethmoid air cells with likely focal optic neuritis and cavernous sinus thrombosis on the right side.



The sample from the sphenoid mucocele showed gram positive filaments on gram staining and non acid fast bacilli on ZN staining. The KOH mount proved the presence of fungal hyphae.

Fig3:The sample from the sphenoid mucocele showed gram positive filaments on gram staining and non acid fast bacilli on ZN staining..



The lab culture revealed the growth of Aspergillus species. The histopathology report showed fragmented pieces of entangled fungal ball composed of long septated fungal hyphae showing acute angle branching and numerous round conidia confirming the diagnosis of Aspergillosis.The bone or the granulation tissue was not involved in this particular section.

Discussion:

Rhino orbital fungal infection can be aggressive associated with poorly controlled Diabetes Mellitus ,haematological malignancies, Hodgkins lymphoma, neutropenia, intravenous drug abuse, cytotoxic chemotherapy, chronic steroid are the risk factors .Diabetes Mellitus being the significant contributor to the infection in patients around 60 to 81 %.

Acute invasive fungal sinusitis is the most fatal form of fungal sinusitis with a mortality of 50-80% is a rapidly progressing infection .It primarily affects immunocompromised patients like uncontrolled diabetes especially diabetic ketoacidosis seldom occurring in healthy people. It is named rhinosinusitis as the primary infection is usually found in the nasal cavity with the middle turbinate showing a positive biopsy result in about 66.66% cases. Aspergillus species are responsible for up to 80% of infections in the immune compromised group[3].

Spore inhalation is the route of infection and it spreads along the neuronal and vascular structures then infiltrates the blood vessel walls. Symptoms of fever ,nasal congestion, serosanguinous nasal discharge, epistaxis and facial pain or numbness. Surveillance of at risk population ,early diagnosis, reversal or treatment of immunosuppresion causes prompt and aggressive surgical debridement with systemic antifungal therapy can decrease the mortality rate from 50-80% to 18%[4].

Subtle soft tissue hypoattenuation is seen within the nasal or paranasal caity on non contrasting CT. Intracranial extension of the infection can occur from the sphenoid sinus leading to cavernous sinus thrombosis. Carotid artery can be invaded ,occluded or fatal hemorrhage can result from pseudoaneurysm.

The chronic invasive fungal sinusitis has a more insidious progression of the disease where symptoms of chronic rhinosinusitis may be recurrent and may take months or years before a diagnosis is made.

Invasion into the orbit may lead to the orbital apex syndrome ,third ,fourth and sixth cranial nerve neuropathy ,diminished vision and proptosis.With invasion of the cribriform plate and cranial fossa focal neurologic defects,seizures and headaches may precipitate.

Chronic Granulomatous Invasive Fungal sinusitis is usually caused by Aspergillus flavus ,which is a highly virulent fungus,commonly occurring in Africa and South east Asia. Its course is indolent making the diagnosis elusive but with extension into the orbital and intracranial areas its progress is rapid and its CT findings and treatment are similar to the chronic invasive fungal sinusitis[5].

It is a rare, life threatening medical emergency therefore early diagnosis and treatment is of prime importance. Rhino orbital mucormycosis has a prevalence of 0.15% in diabetic patients.However Rhino –orbital-cerebral mucormycosis as a presenting feature is rare.The prognosis of mucormycosis has improved over the past 30 years,with a 90 % survival rate[6].

Paultauf in 1885 first described Mucormycosis and named the disease as 'mycosis mucorina. Three cases of mucormycosis were reported in diabetics in 1943.Schwartz et al noted that Cerebro-Rhino-Orbital Phycomycosis (CROP) occured mostly in diabetes ketoacidosis patients . Proptosis, ophthalmoplegia, loss of vision and death from cerebral involvement are most common features of CROP[7].

Prognosis in such cases is unpredictable. Visual loss and ocular motor palsies were reversible in certain cases with aggressive therapy though optic neuropathy was found to be permanent.Lee et al in his study found a noteworthy improvement in the function of ocular motor palsies as compared to visual acuity with a mean recuperation time of about 5.1 months[8].

Conclusion:

Fungal sinusitis with orbital and cavernous sinus involvement can result in irreversible optic neuropathy. The insidious course of the disease makes it difficult to diagnose and the delay results in further complications. A high index of suspicion is needed to diagnose this condition in any infection involving the face especially if not responding to conventional antibiotic therapy. The aggressive nature of the disease makes it mandatory for an early diagnosis , confirmation with histo-microbiological examination is necessary. The subsequent prompt surgical debridement with antifungal therapy is necessary to improve the outcome.

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