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MULTIFACETED APPROACH TO MUCORMYCOTIC SKULL BASE OSTEOMYELITIS: A CASE STUDY

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ABSTRACT

Mucormycosis is a deadly opportunistic infection caused by a fungus of class Zygomycetes and the order Mucorales. It is rarely seen in head and neck region.Skull bone can be affected due to mucormycosis after the infection has penetrated sinonasal, orbital and deep facial soft tissue, which is uncommon and poses both a diagnostic and therapeutic challenge as patient typically presents with non specific headaches or facial pain,radiographic findings that can mimic central skull base malignancy and there is a lack of otolgic symptoms. It most commonly affects immunosuppressed individual, infection in immunocompetent individual is extremely rare.

Keywords: mucormycosis, osteomyelitis, skull base, sinonasal, orbital

1. INTRODUCTION

We report a case of mucormycotic skull base osteomyelitis in a immunocompetent individual. Owing to its rare incidence, high mortality and substantial difficulty in diagnosing following case study will focus on importance of multifaceted approach in mucormycotic skull base osteomyelitis aiding in early diagnosis and prompt treatment planning.

2. METHODOLOGY

Case : A 64 year old male patient presented with cheif complaints of hemifacial pain with unilateral headache on right side from 25 days for which patient consulted a neurologist who started him on tab pregablin post which facial pain improved but headache wosened spread to left side. His medical history was non contributory. On examination paresthesia of the right side upper lip and angle of the mouth was present. There was no signs of oral infections with normal mouth opening and no other functional neurological deficits.

Patients haematological investigations were within normal limits. On the basis of history and clinical examination diagnosis of trigeminal neuralgia was made. Further radiological investigations were done.

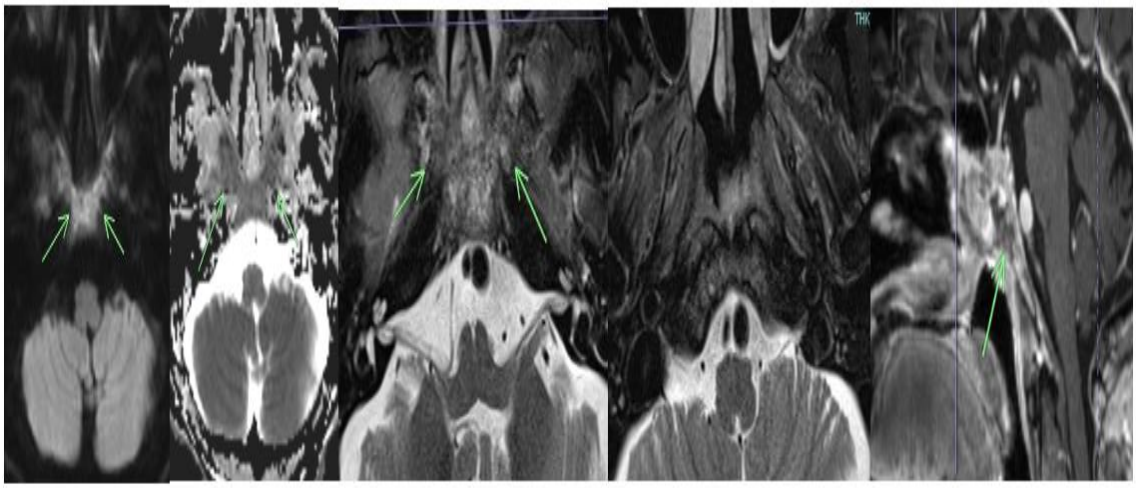

Figure 1: MRI Brain showing patchy heterogeneously enhancing marrow signal alteration is noted in the clivus [right more than left] and the adjacent sphenoid bone around the sella with irregular non-enhancing osteolytic areas. Mild accentuated enhancement of the dura along the posterior aspect of clivus, bilateral Meckel's caves and medial aspects of the temporal lobes. Mild accentuated enhancement extending along the bilateral foramen ovale and rotundum along the V3 and V2 segments of trigeminal nerve on either side, respectively.

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Figure 2 : CT PNS showed Irregular osteolysis and permeative destruction involving the clivus. Moderate mucosal thickening in both halves of sphenoid sinus with focal erosion / osteolytic bone defect along the floor of sphenoid sinus.Variable erosions of the floor of sella turcica. Similar subtle erosions of the postero-lateral walls of both sphenoid sinuses and the intersphenoid septum. Irregular erosions of the bilateral pterygoid plates. Mild edematous thickening of the pre-clival and nasopharyngeal soft tissue.

Although these imaging features are seen in infective / inflammatory etiology like skull base osteomyelitis, in view of absence of constitutional symptoms an low clinical suspicion of infection, possibility of neoplastic etiology such as hematological infiltrative disease process or metastasis was considered

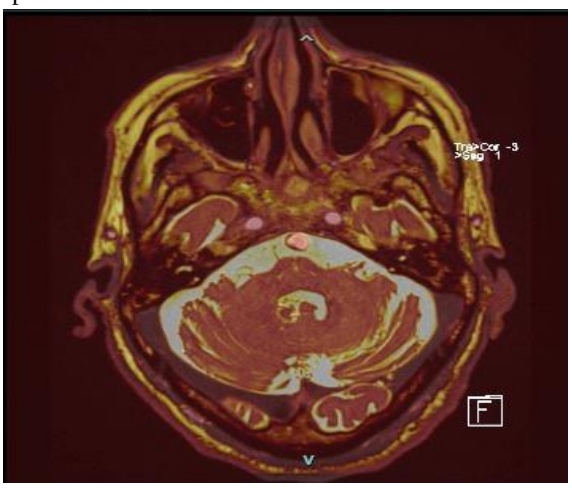

Figure 3: PET CT showing Metabolically active lucent and permeative lesion is seen involving clivus, sella turcica, body of sphenoid bone, bilateral lesser wing and bilateral pterygoid plates likely suggestive of infective pathology (osteomyelitis).

Patient underwent endoscopic guided debridement and biopsy of the lesion. Tissue sample was sent for gram stain, fungal culture and histopathological examination. Aerobic culture was negative.

Figure 4 : Gram stain showed narrow and acute aseptate fungal hyphae with 90 branching.

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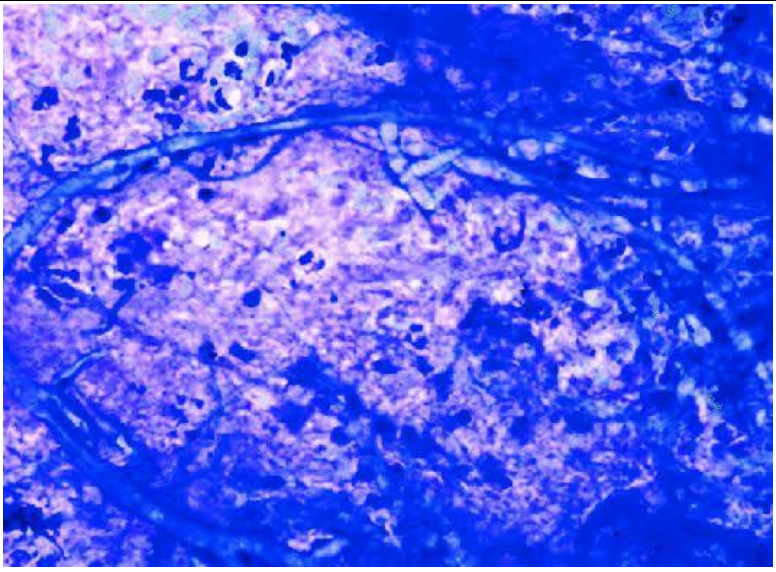

Figure 5 : Histopathological examination showed broad aseptate hyphae with right angle branching.

Fungal culture was negative therefore tissue sample was sent for PCR which confirmed the diagnosis of mucormycosis and identify species as mucor .

Patient was started on tab posconazole 300 mg bd for 6 weeks.

3. DISCUSSION

Skull base osteomyelitis due to mucormycosis is quite rare and generally occurs in the last stage of disease.The base of skull forms the first line of barrier to be breached direct contiguous spread via neural foraminae, bony erosion cribiform plate, ethmoid fovea, wall of the frontal and sphenoid sinuses, orbital apex or blood borne spread causing fungal embolic phenomenon leading to transition of rhino orbito palatal forms of mucormycosis to intracranial forms with various neurological deficit. Isolated sphenoidal sinusitis in immunocompetent individual is notoriously occult manifesting often as a minor symptom of headache.[1] Early biopsy of the lesion is imperative for definite treatment protocol as the infection progress rapidly manifesting as skull base osteomyelitis in the later stage. Deep biopsies are necessary to diagnose the fungus and superficial scrapping may show the necrotic tissue. Cultural proof of the causative agent is challenging, as approximately two thirds of histopathologically positive samples remain culture negative. Fragile non septated growth of these fungi make them prone to mechanical damage. Histopathological examination can provide differential of potential fungal pathogens but identification of species or genus is not possible based on those findings. Molecular method broad-range internal transcribed spacer (ITS) rRNA gene PCR followed by sequencing should be used in parallel in order to achieve rapid and accurate diagnosis of invasive fungal disease.[2]

4. CONCLUSION

Diagnosis and treatment of mucormycosis is multifaceated and involves a combination of early biopsy, culture method, histopathological examination, molecular methods, surgical debridement, antifungal therapy, and elimination of predisposing factors. Surgical debridement is required prior to medical therapy allows better penetration of antifungal agents to the site of infection.

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