

Sinonasal Mucormycosis : Diagnosis Using Computed Tomography

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MJAFI 2003; 59 : 243-245

Key Words : Computed tomography; Sinonasal Mucormycosis

Introduction

Fungal infection of the paranasal sinuses is an increasingly recognized entity both in normal and immunocompromised individuals. A variety of different causative organisms are responsible for paranasal mycosis, *Aspergillus* and *Mucormycoses* being the commonest [1]. Paranasal mycosis manifests as two distinct entities, a benign or non-invasive infection and the more serious invasive infection, which occurs in immunocompromised individuals and is characterized by its rapid onset, ability to invade tissues and cause destruction. It is important to distinguish the invasive disease from the noninvasive because treatment and prognosis are different in each. Early diagnosis is vital in these infections because delay in initiation of treatment can be life threatening due to the propensity of the fungi to invade adjacent blood vessels and embolize to distant organs including brain. Computed tomography (CT) with axial and coronal sections is a highly accurate and non-invasive modality of accurately imaging sinonasal mycosis.

We report a case of maxillary sinus mucormycosis that was diagnosed using CT and definitive treatment initiated within 24 hours of its presentation thereby preventing any complication.

Case Report

A 55 year old lady, known diabetic for the last 10 years on oral hypoglycaemic agents, presented with signs and symptoms of diabetic ketoacidosis of five days duration. She was managed in medical ICU for the same. During her stay in the hospital she developed high fever with pain and swelling of the right cheek of one-day duration. Clinical examination revealed the patient to be febrile with pain and swelling of the right hemi face and maximum tenderness over the right maxillary sinus. The skin over the swelling showed signs of inflammation. Examination of the nasal cavity revealed watery discharge with slight amount of pus. A clinical diagnosis of right maxillary sinusitis was made and a radiograph of the paranasal sinuses was taken, which revealed complete opacification of the right maxillary sinus

with mild haziness of the left maxillary sinus. A CT scan of the paranasal sinuses was done to rule out fungal infection keeping in mind the immunocompromised state of the patient.

Pre and post contrast CT scan of the paranasal sinuses revealed a soft tissue density mass lesion arising from the right maxillary antrum with contiguous extension into the nasal cavity, causing destruction of its medial wall (Fig 1 & 2). The soft tissue mass lesion showed a small speck of hyperdensity (45 HU) and nonhomogenous enhancement (Fig 3). Bone windows revealed erosion of the medial wall of the right maxillary antrum, middle turbinate and the uncinate process of the ipsilateral side (Fig 4).

Mucosal thickening of the left maxillary and right ethmoidal sinuses was also present. There was no erosion of the anterior or lateral wall of the right maxillary antrum. Based on the CT findings, a diagnosis of fungal sinusitis was made. Patient underwent an extended antrostomy of the right maxillary antrum and the antral wash revealed necrotic mucosa and pus. Histopathological examination of the mucosa showed broad aseptate hyphae with right angled branching consistent with fungal hyphae resembling mucor. Patient's diabetic state was controlled with insulin and she was started on Amphotericin B, antibiotics and taken up for surgical debridement of the right maxillary antrum. Following this, the patient improved, swelling and pain over the right cheek subsided and she was asymptomatic within three days.

Discussion

Over the last decade, the incidence of fungal infections has increased considerably due to increase in illness like AIDS, immunosuppressive therapy due to organ transplant and other diseases like lymphomas and leukemias.

Fungal sinusitis occurs in two forms : noninvasive which presents as intractable sinusitis and nasal polyposis that fails to respond to repeated courses of antibiotics. It is seen in immunocompetent individuals also and has a slow mild course with no tissue invasion, expansion or erosion of the sinus walls. The common

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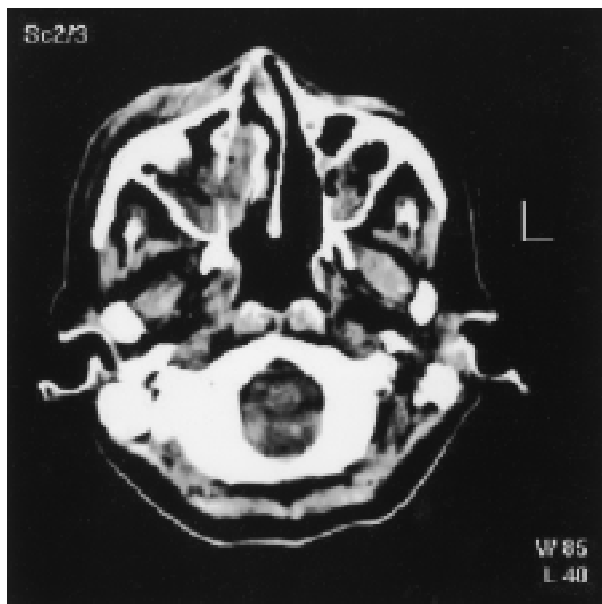


Fig. 1 : CT of paranasal sinuses (axial section) showing soft tissue mass lesion in right maxillary sinus with destruction of its medial wall



Fig. 3 : Contrast enhanced CT of the paranasal sinuses (axial section) showing nonhomogeneously enhancing soft tissue density mass lesion with a speck of hyperdensity



Fig. 2 : CT of paranasal sinuses (coronal section) showing soft tissue mass lesion in right maxillary sinus extending to the ipsilateral nasal cavity with erosion of uncinate process and middle turbinate

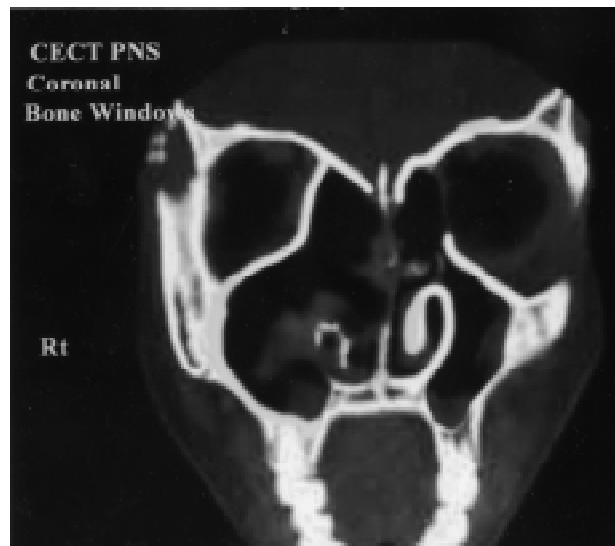


Fig. 4 : Contrast enhanced CT of the paranasal sinuses (coronal section - bone windows) showing destruction of the medial wall of the maxillary sinus, middle turbinate and the uncinate process of the right side

causes of noninvasive fungal sinusitis are *Aspergillus* and *Mucor*.

Imaging findings may be non-specific and include unilateral or bilateral pansinus inflammatory changes such as polypoid mucosal thickening. Foci of hyperdensity in the affected sinus on CT scans are highly suggestive of fungal disease [2]. The invasive form of fungal sinusitis is usually associated with poorly controlled diabetes but any immunocompromised patient is at risk from this opportunistic infection. It usually starts in the nasal cavity or paranasal sinuses and may secondarily involve the orbit leading to painful

ophthalmoplegia, cavernous sinus thrombosis and cranial nerve palsies. This fulminant form of fungal infection results in vascular invasion leading to cerebral ischaemia, occlusion and infarction. Imaging features include aggressive enhancing soft tissue density mass extending beyond the confines of the sinus cavity and causing bone erosion [3]. Extension of the inflammation to the soft tissues of the anterior cheek in patients with maxillary sinusitis is highly suggestive of fungal sinusitis. CT is 100% sensitive and 78% specific in the diagnosis of sinonasal mycosis [4]. Imaging features may mimic carcinoma but the diagnosis of invasive mycotic infections should be considered in the appropriate clinical

settings.

In conclusion, it is emphasized that an early diagnosis is imperative in managing invasive fungal sinusitis so that potentially fatal complications can be avoided.

This can only be achieved by imaging studies like CT. Furthermore, aggressive treatment with antifungals, antibiotics and wide debridement are the key to successful management of paranasal mycosis.

References

1. Robb PJ. Aspergillosis of the paranasal sinuses : a case report and historical prospective. *J Laryngol Otol* 1986;100:1071-7.
2. Rao VM, Khaled I El-Noveam. Sinonasal Imaging : Anatomy and Pathology. *Radiol Clin North Am* 1998;36(5):921-39.
3. Som PM, Curtin HD. Chronic inflammatory sinonasal diseases including fungal infections. The role of Imaging. *Radiol Clin North Am* 1993;31(1):33-44.
4. Gupta AK, Mann SB, Khosla VK, Sastry KV, Hundal JS. Non-randomised comparison of surgical modalities for paranasal mycosis with intracranial extension. *Mycoses* 1999;42(4):225-30.

Pathological Quiz

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Clinical Information

This 25 year old serving soldier, was under treatment for pulmonary tuberculosis and *Pneumocystis carinii* pneumonia in the background of HIV infection. While on treatment, he developed low-grade intermittent fever, which lasted for two months. He was found to have tender, multiple, mobile, discrete, enlarged lymph

nodes in the left cervical region, largest measuring 3x4 cm. Ultrasonography of abdomen showed mesenteric lymph node enlargement without ascites or hepatomegaly. FNAC of lymph node from the left cervical region showed the picture given in Fig 1 (250x).

What is your diagnosis?

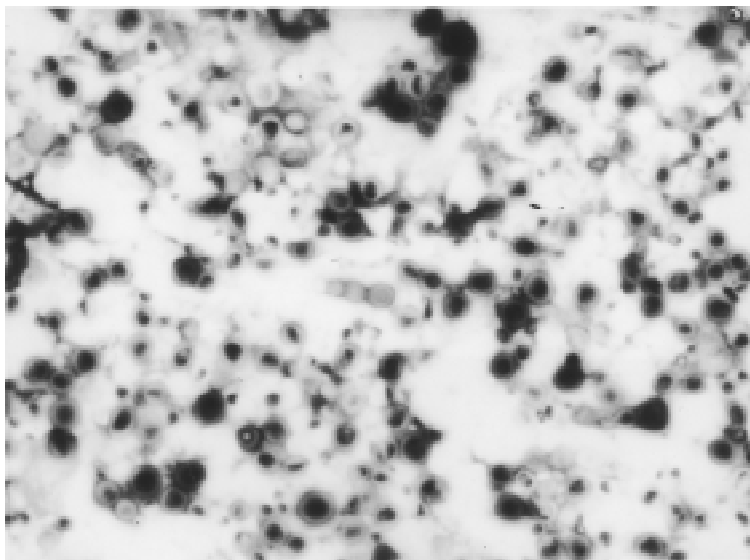


Fig. 1 :

Answer to the Pathological quiz - pg. 268

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