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CASE REPORT OPEN ACCESS

Pott's tumours - Our experience

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Abstract

Pott's puffy tumour is most frequently associated with bacterial infection but fungus causing Pott's puffy tumour is very rare. A case series of three patients with Pott's puffy tumour caused by fungi of different species like candida, aspergillus, mucor along with the clinical findings and management is presented here.

Keywords: Pott's tumour; fungal aetiology; puffy tumour

Introduction

Pott's puffy tumour (PPT) first described in 1760, is a lesser known clinical entity. It is often seen as a complication of osteomyelitis of frontal bone with subperiosteal abscess [1]. Etiologically it is most frequently associated with bacterial infections like streptococcus, staphylococcus etc. Very rarely this can be caused by different fungi like aspergillus, candida etc. There are very few cases reported so far on fungi causing Pott's tumour. A case series of three patients with Pott's puffy tumour is presented here.

Case 1

A 54-years-old male patient came to ENT OPD with complains of recurrent forehead swelling and right periorbital puffiness since 3 months (Figure 1).

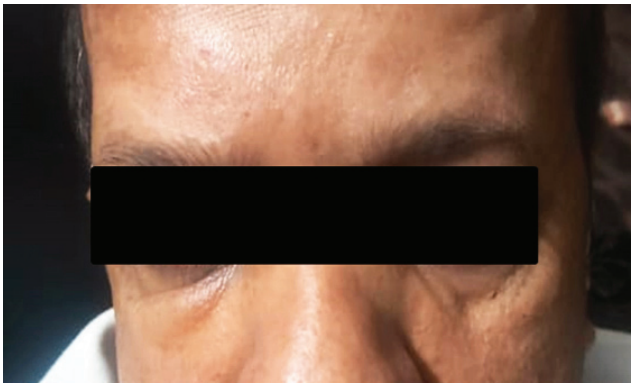

Figure 1: Boggy forehead swelling.

There was no history of headache, seizure or fever. No past history of COVID-19 infection was present. He was a diabetic and had undergone percutaneous transluminal coronary angioplasty (PTCA). Vision and ocular movements were normal. Diagnostic nasal endoscopy showed pus in the right middle meatus (Figure 2).

MRI with contrast showed features of frontal osteomyelitis with subperiosteal puffiness suggestive of Pott's puffy tumour (Figure 3).

Pus from the middle meatus was taken and sent for fungal stain and fungal culture which showed growth of aspergillus (Figure 4).

As the patient had to stop antiplatelet agents in view of PTCA, surgery had to be deferred. He was counselled

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and advised to take oral antifungal medication as he was not fit for surgery from cardiology point of view. So he was started on antifungal medication like tablet. Voriconazole 6mg/kg twice daily for first 2 doses followed by 4mg/kg twice daily for 6weeks, which is the first drug of choice for aspergillus. He was successfully treated by oral antifungal medications and no surgical intervention was done to decrease the fungal load. The patient was doing well with clinically. Repeated CT scan showed resolution of disease radiologically. Patient was on regular follow-up.

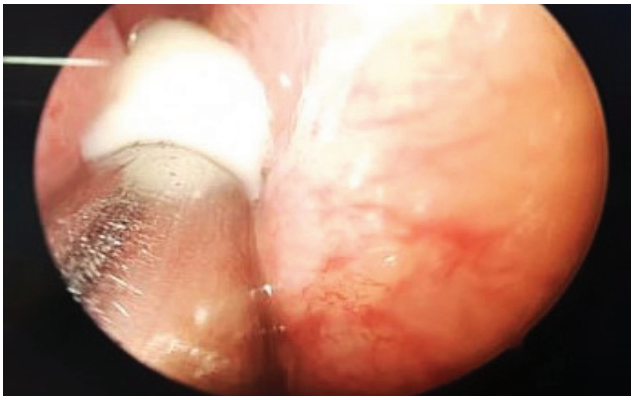

Figure 2: Pus in right middle meatus.

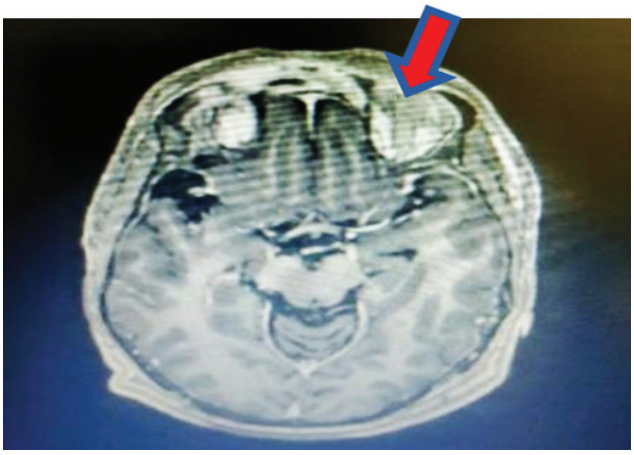

Figure 3: MRI showing bulge in subperiosteal plane.

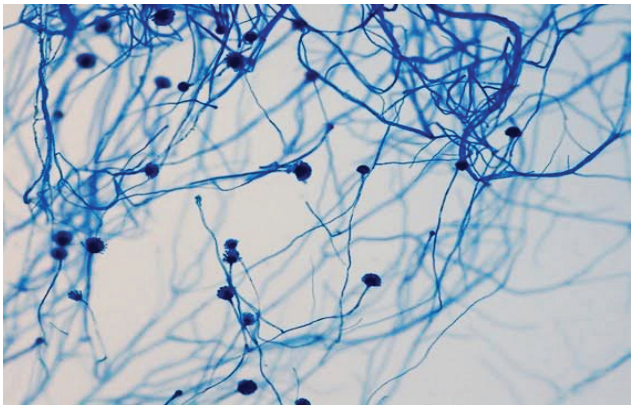

Figure 4: Fungal stain (LCD) showing aspergillus colonies. The cell wall of fungus taking up the stain with acute angle branching, segmented hyphae & conidiated sporangia.

Case 2

A 56-years-old male patient came to our OPD with high grade fever since two weeks associated with chills and rigors. He was also having a swelling in the forehead since 10 days over the eyelids but with normal vision. At a local hospital, 100 ml of pus was aspirated from the swelling followed by parenteral antibiotics. There was no history of vomiting or seizure. He had on and off history of nasal obstruction since one year and was treated for sinusitis intermittently. He had no COVID-19 episode. On examination, the swelling over the forehead was diffuse and involved the frontoparietal area of the scalp. It was tender and fluctuant with a local rise of temperature (Figure 5). There was tenderness over bilateral frontal, maxillary and ethmoidal areas. Curdy white discharge was seen in the left middle meatus and mucopus was seen on the right side on diagnostic nasal endoscopy (Figure 6). CT PNS (Figure 7) & MRI (Figure 8) showed swelling over the frontoparietal region with an intracranial involvement. Bilateral fess was done followed by a thorough debridement by the neurosurgeon.

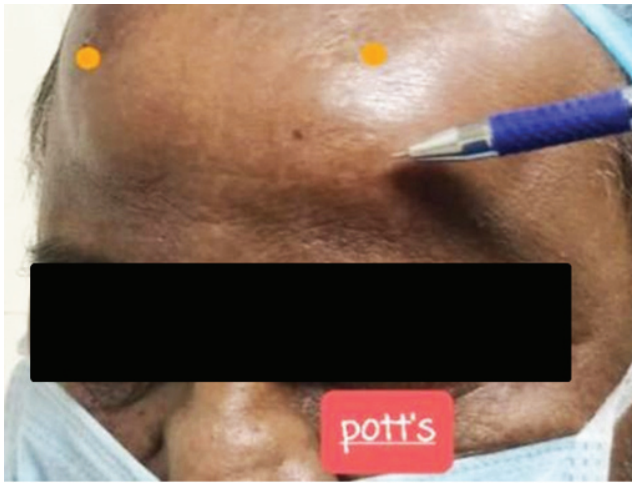

Figure 5: Diffuse swelling over forehead.

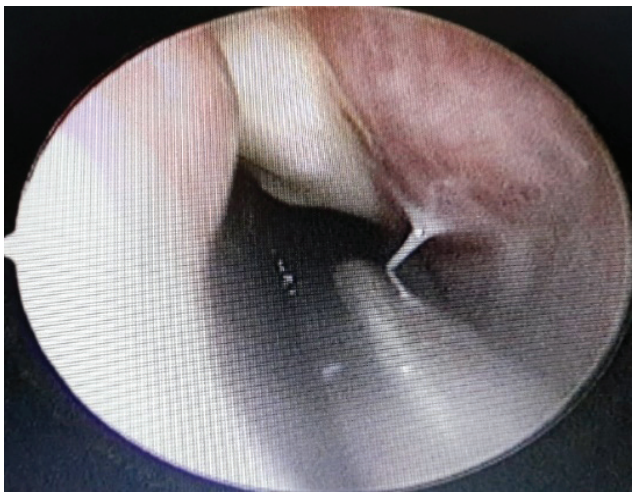

Figure 6: Mucopus in left middle meatus.

The granulation tissue from frontal sinus on histopathology reported candida as the causative organism and is an unusual one causing Pott's disease (Figures 9 & 10). The patient was started on antifungal medication post operatively i.e tablet. Fluconazole 200mg-800mg once daily for 4-6weeks. Patient has recovered with a complete resolution of the forehead swelling on follow up.

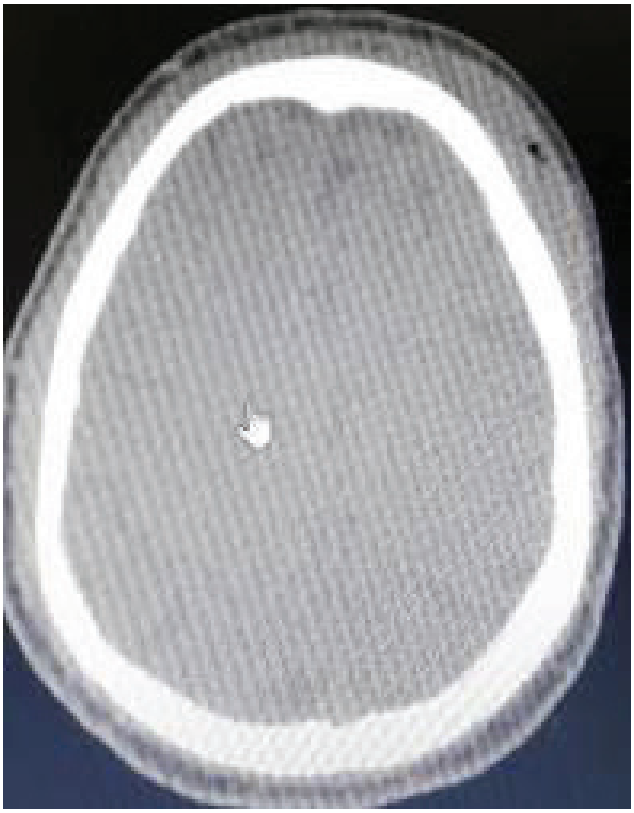

Figure 7: CT with swelling in the left frontoparietal area.

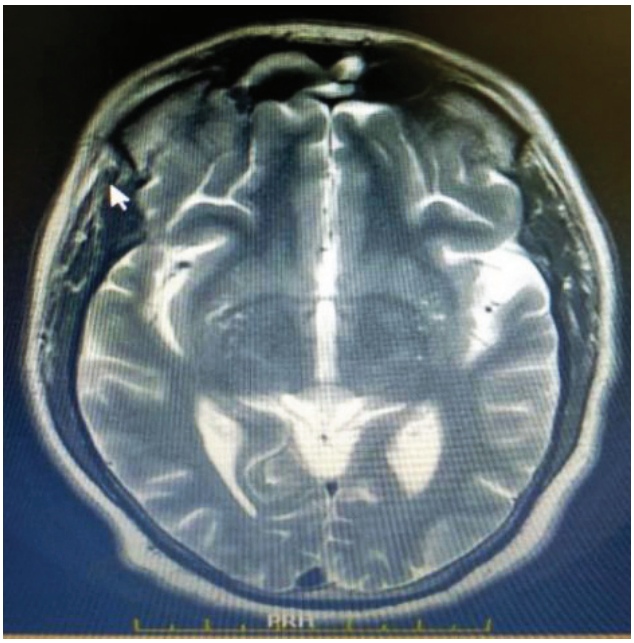

Figure 8: MRI with subperiosteal collection and an intracranial involvement.

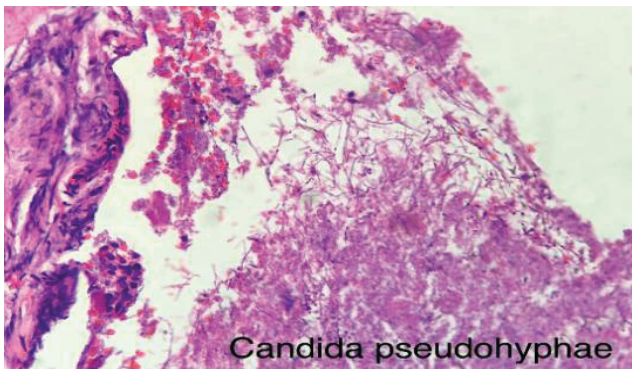

Figure 9: H&E stain showing pseudohyphae with few budding yeast, 10x.

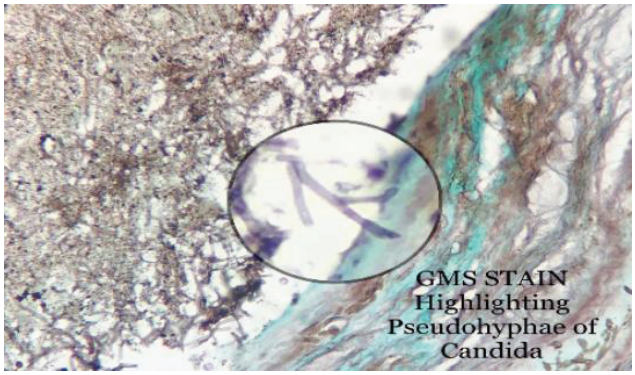

Figure 10: GMS stain highlighting pseudohyphae of candida, 100x.

Case 3

A 46-years-old male patient came with complains of forehead and jaw swelling with facial pain from 3-4months. The swelling was diffuse, with severe pain in the cheek and forehead. Patient had COVID-19 in 2021 pandemic for which he was investigated and operated by performing functional endoscopic sinus surgery recently and was advised post op antifungal medications like liposomal amphotericin B after the biopsy report confirmed mucomycosis. The nasal endoscopy this time showed necrotic tissue in the nose involving the septum and turbinates (Figure 11). The recent CT PNS showed frontal osteomyelitis with an intracranial and intraorbital extension of the infection (Figure 12). He was taken up for endoscopic sinus surgery with right orbital exenteration as it was involving the orbital contents which showed change in the colour & consistency of the orbital fat & orbital muscles along with bilateral maxillectomy which was also found necrotic & blackish discoloration along with the debridement & clearance of frontal bone which was done as a combined surgical approach by the ENT surgeon, neurosurgeon and maxillofacial surgeon. The tissue was sent for histopathological examination (Figure 13). It revealed mucormycosis. Postoperatively patient was put on liposomal amphotericin B 5mg/kg IV once daily for 2 weeks or maximum up to few weeks

to a month depending on the clinical improvement on regular follow up as per the infectious disease protocol. Poor prognosis was explained as infection was progressing rapidly.

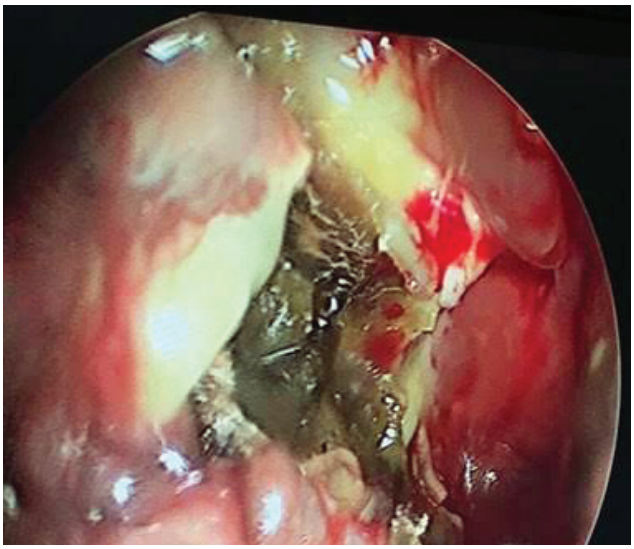

Figure 11: Nasal endoscopy showing necrotic tissue in the septum & turbinates.

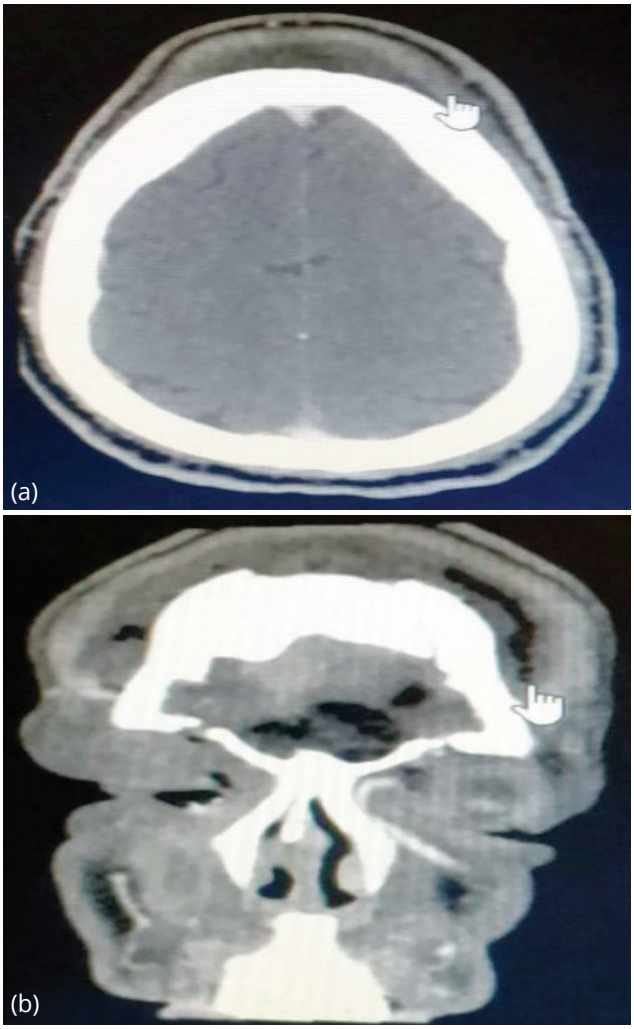

Figure 12a,b: CT PNS showing frontal osteomyelitis with an intracranial and intraorbital extension of the infection.

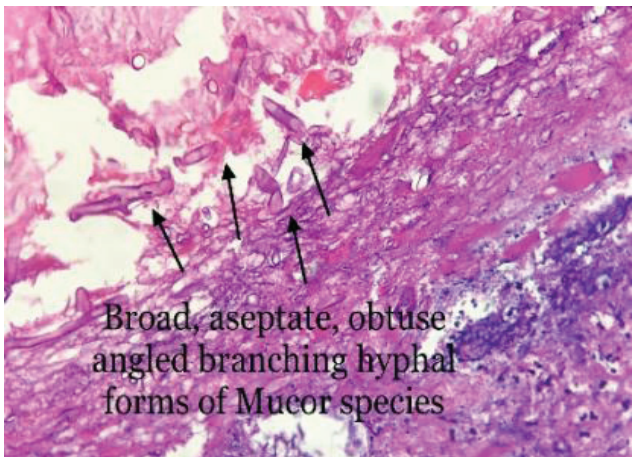

Figure 13: In HPE, H & E stain showing broad, aseptate obtuse angled branching hyphae of mucor, 40X.

Discussion

Pott's Puffy Tumor (PPT) first described in 1760 by Sir Percival Pott is a lesser known clinical entity. It is described as a forehead swelling resulting from osteomyelitis of the frontal bone with associated subperiosteal abscess [1].

Tumour in this case refers to an observable swelling of the forehead rather than any neoplasia [1]. It is characterized by a circumscribed, tender swelling on the forehead presenting with other signs and symptoms like fever, headache, nasal discharge, visible swelling over the forehead, hypoaesthesia of the involved region (in case of mucormycosis) or an increased intracranial pressure along with signs of apecific intracranial region involvement depending on the extent of spread [2, 3]. Sinonasal infection is the most common cause of this rare complication of acute or chronic frontal sinusitis. Pott's puffy tumour is mostly caused by bacteria like streptococcus, staphylococcus, enterococcus and anaerobic bacteria. Only 0.5-2% patients develop bacterial sinusitis and of these 80% patients resolve with antibiotics. In rare cases this sinusitis leads to serious complications like PPT [4-7]. Immunocompromised individuals have a higher risk for development of PPT [4, 6]. Sir Pott initially thought that trauma was the only cause for this condition but later discovered that frontal sinus infection is the leading cause of PPT. Due to use of broad spectrum antibiotics, its incidence has dramatically decreased [7]. The infection of PPT is most commonly from frontal sinus infection either via direct extension or through septic emboli [2]. The male to female ratio is 9:1. Adolescents are affected more frequently due to high vascularity of the diploic venous system at this particular age [5, 6]. PPT is a serious condition as it is associated with a high rate of intracranial complications such as meningitis, subdural and epidural empyema, cerebral abscess,

cavernous sinus thrombosis and superior sagittal sinus thrombosis [8, 9]. Clinical presentation in case of fungal osteomyelitis can vary from nasal discharge, swelling in the premaxilla in case of rhino orbital mucormycosis or as maxillary hypoaesthesia. There was a strong association between COVID-19 infection and mucormycosis along with presence of diabetes mellitus and other comorbid conditions and a history of hospitalization during COVID-19. Current guidelines also suggest the use of steroids in admitted patients requiring O_2 support [10-14]. In case of aspergillosis, the associated finding during surgery was presence of a fungal ball without tissue invasion [12].

In candidiasis, caseous cheesy material is seen in the sinuses [15, 16]. In mucormycosis, the fatality rate is 46% [10]. CECT, MRI brain & PMS fungal/ Tzanck stain are diagnostic modalities of choice. Diagnosis of fungal infection is based on direct microscopy with KOH mounted slides when urgent treatment is warranted and confirmatory diagnosis is based on definitive histological evidence of tissue invasion and culture. The fungal culture is costly and may take up to 6 weeks [17]. Treatment ranges from removal of fungal ball in case of aspergillus to early aggressive surgical treatment in mucormycosis along with specific single or combination of systemic antifungals like voriconazole, itraconazole, isovuconazole, posaconazole for Aspergillus, fluconazole, echinocandinds, voriconazole for candida and lamb, isovuconazole, posaconazole for Mucormycosis are mandatory [17-20]. A multidisciplinary approach to the appropriate diagnosis and treatment of the clinical disease is needed to render the patient a normal life. PPT is considered to be an emergency and treatment is initiated as soon as possible along with urgent surgical intervention which may include endoscopic sinus surgery or craniotomy if needed [11]. Fess is a safe and less invasive surgical procedure [21, 22]. The decision of whether or not to do a craniotomy depends on the size of the intracranial extension [9, 22]. In cases described here, a combined surgical approach was coordinated by the otorhinolaryngologist and the neurosurgeon. Fess with craniotomy and aspiration of the subperiosteal collection, sequestrectomy and frontal bone debridement were all done as and when needed depending on the disease. Appropriate antifungals in the postoperative period is the best regimen for fungus causing PPT [10].

Conclusion

Pott's puffy tumour is a lesser known disease, mostly caused by bacteria like streptococcus, staphylococcus, enterococcus and anaerobic bacteria. Fungi causing this presentation is very rare and mostly by aspergillus fumigatus. There are very few cases reported so far on fungi causing Pott's tumour. The key to appropriate diagnosis is adequate sampling taken for culture, combined with CT and MRI to know the extent of the spread. It needs a multidisciplinary approach involving an otorhinolaryngologist, neurosurgeon and maxillofacial surgeon for adequate removal of the disease. A possible fungal etiology for Pott's disease especially in post COVID-19 patients and immunosuppressed individuals should be considered.

Conflicts of interest

Authors declare no conflicts of interest.

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