



POTT'S PUFFY TUMOR: A CASE REPORT

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ABSTRACT

Pott's puffy tumor (PPT) is a rare complication of sinusitis characterized by osteomyelitis of the frontal bone with subperiosteal abscess presenting as frontal swelling. It was first described by Sir Percival Pott in 1768 in relation to frontal head trauma. Later, it was established that this entity is more common in relation to frontal sinusitis (1). In this article we report a case of PPT in a 17-year-old boy. CT scan confirmed subperiosteal abscess. At surgery, the subperiosteal abscess was drained and sequestrectomy of the affected frontal bone was done. Broad-spectrum antibiotics were given for 4 weeks. The patient recovered without residual problems and has remained well. PPT is now relatively uncommon and early diagnosis and prompt treatment is necessary to avoid further intracranial complications, which can be life-threatening.

Key words: Complication of sinusitis; Frontal osteomyelitis; Subperiosteal abscess

CASE REPORT

A 17-year-old boy was referred to our unit with a history of painful right periorbital swelling (**Figure 2**) that was associated with a fever over 39°C and headache, started two days ago. He was treated with antibiotics prescribed by a pediatrician. On physical examination, he had a small, fluctuant swelling (4cm x 3cm) with diffuse oedema and erythema. White cell count was 14×10^9 /L and C-reactive protein of 104 mg/L. An ECG and a chest X-ray were unremarkable. Cranial computed tomography scan showed a right-sided subperiosteal forehead collection and a right-sided collection with underlying frontal lobe oedema (**Figure 1**). Erosion of the anterior and posterior wall of the right-sided frontal sinus was not confirmed on the CT image.

The goal of treatment in Pott's puffy tumor is to remove the infective focus by debridement, antibiotic therapy to prevent intra-cranial or

orbital complications and to maintain the patency of the sinus outflow tract. In our case we used parenteral, broad-spectrum antibiotics (ceftriaxone 50mg/kg body weight daily, and metronidazole 7.5mg/kg body weight 8 hourly).

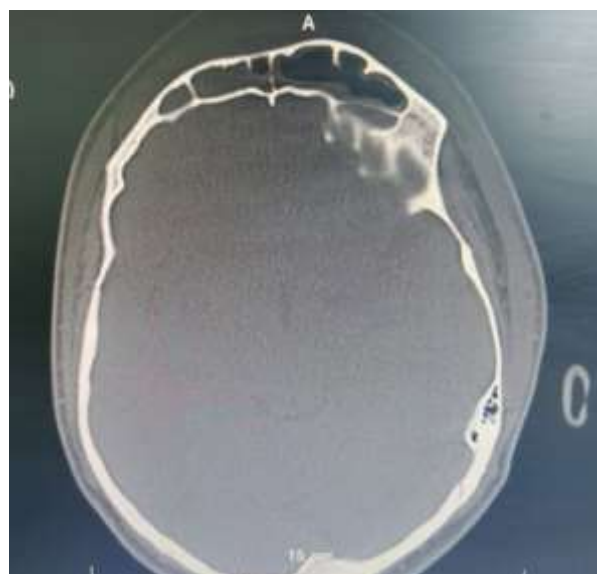


Figure 1. Cranial computed tomography scan of the patient presenting right-sided subperiosteal abscess.

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A close collaboration between otorhinolaryngologists, neurosurgeons and ophthalmologists is necessary for appropriate and life-saving management of patients with this pathology. Traditionally, surgical treatment of Pott's puffy tumor requires an external approach that provides good direct visualization of lesions on the frontal sinus. After parental consent, the patient was submitted to surgery with a bicoronal skin incision (**Figure 3**), exposing the infiltrated subcutaneous tissue. The periosteum of the frontal sinus was incised with drainage of the pus from the subperiosteal abscess and removal of the non-vital bone (**Figure 4**). A

lesion on the anterior and posterior wall of the frontal sinus with disruption of septum sinuum frontalis was visualized. The anterior wall of the frontal sinus was reconstructed with a titanium implant (**Figure 5**). To avoid late complications, such as mucocele formation, and after extensive removal of debris and specimen sampling, we didn't obliterate frontal sinuses with fat tissue, and the pathway to the nasal cavity was secured (**Figure 6**). The culture of abscess fluid revealed grew *Staphylococcus aureus*. The post-operative course was uneventful. He was discharged after 5 days; the antibiotics were continued orally for 4 weeks.



Figure 2. Right periorbital swelling.



Figure 3. Bicoronal skin incision



Figure 4. Drainage of the pus from the subperiosteal abscess.



Figure 5. Reconstruction of the anterior sinus wall with titanium implant.



Figure 6. Poviding pathway to the nasal cavity

DISCUSSION

Pott's Puffy Tumor is a rare pathology due to advances in antibiotic treatment (2). It can occur in all ages but shows a predilection for adolescents due to increased vascularization in the diploic circulation of the frontal sinus in this age, which allows a faster spread of infection. Globally, males are affected more frequently (3,5:1) but there's no evidence for racial predication. The etiological agents most frequently associated with this infection are *Streptococcus*, *Staphylococcus*, *Enterococcus*, *Bacteroides* sp and anaerobic bacteria. Nevertheless, these infections are often polymicrobial and antibiotic coverage should include gram-positive and anaerobes (3). The imaging modality of choice to confirm the diagnosis is a computed tomography (CT) scan that can evidence frontal sinusitis, bone erosion, subperiosteal collection, and extradural abscess. Magnetic resonance imaging (MRI) is the gold standard to detect the presence of intracranial complications. Since MRI is a method with absence of

radiation, it is useful in follow-up after medical or surgical management. The treatment goal of Pott's Puffy Tumor is to prevent its progression to life-threatening intracranial complications.

A close collaboration between otorhinolaryngologists, neurosurgeons and ophthalmologists is necessary for appropriate and life-saving management of patients with this pathology (4). The standard of care is intravenous broad-spectrum antibiotics with good penetration in CNS and anaerobic coverage for 4 to 6 weeks (clindamycin, ceftriaxone, metronidazole, vancomycin), along with surgical treatment as drainage of subperiosteal abscess, eradication of potential infection in sinuses, and treatment of possible intracranial complications. Imaging follow-up should be performed with MRI. The mortality rate of around 12% is usually due to increased intracranial pressure, thrombosis, ischemia and sepsis.

CONCLUSIONS

Pott's puffy tumor is an uncommon disease that most often presents in adolescents as headache, fever, vomiting, and forehead swelling with tenderness, periorbital swelling, purulent nasal drainage and mental status changes. Early diagnosis, prompt surgical intervention and management of PPT permit a better prognosis and avoid potential long-term consequences in these patients.

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