

Not Your Typical Preseptal Cellulitis: A Case Report Of Pott's Puffy Tumor

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Abstract

Pott's puffy tumor (PPT) is defined as a subperiosteal abscess and osteomyelitis of the frontal bone that occurs as a rare complication of trauma or acute sinusitis. Most common presenting symptoms include headache, fever, rhinitis, local tenderness and nasal obstruction. While initially thought to be a rare entity, PPT appears to be occurring with increasing frequency with most complications managed surgically. We present a 14 year-old girl who presented with an initial diagnosis of preseptal cellulitis that failed both oral and intravenous antibiotics. Repeat imaging revealed a frontal bone subperiosteal abscess and osteomyelitis, without intracranial extension and was successfully managed medically without surgical intervention.

KeyWords: Precis Pott's Puffy Tumor: a potentially life threatening condition presenting as preseptal cellulitis, successfully treated with medical management.

Case Report

A 13-year-old girl presented to an emergency room with a 2 day history of right upper lid edema, and a 3 day history of localized induration on her forehead. She endorsed an incidental history of trauma, hitting the right side of her face from a ground level fall and being hit by a football in the same area, four or five days prior to presentation, respectively. She was diagnosed with acute on chronic sinusitis and preseptal cellulitis and treated with outpatient oral antibiotics. She was admitted for intravenous antibiotics after worsening on outpatient therapy and developing left upper lid edema. At this point, she was transferred to our institution for further care. She denied vision loss, eye pain, diplopia, fever, headache, congestion or chills. On exam, her vision was 20/20 right eye and 20/25 left eye, with normal intraocular pressures, pupils, confrontational visual fields, red saturation and color vision. Extraocular movements were full, anterior and fundus exam were normal in both eyes. She had erythema of bilateral upper and lower eyelids with swelling of the right eyelids more than left, minimal mucous collection on lashes, and no proptosis or chemosis (**Fig-1A**). On laboratory evaluation, she had a WBC of 17.48, segmented neutrophils of 10.9, ESR 81 and CRP of 8.6. Her initial CT scan of the face without contrast revealed extensive mucosal thickening of paranasal sinuses (**Fig-2**), near complete opacification of right sphenoid and ethmoid sinuses and periorbital soft tissue thickening. A repeat CT scan with contrast was obtained upon admission to our institution, which revealed inflammatory changes along the medial wall of the right orbit with concern for phlegmon formation without a definite abscess. The patient was continued on intravenous broad spectrum antibiotic coverage with piperacillin/tazobactam and clindamycin. She had minimal

clinical improvement after five days with persistent bilateral eyelid erythema and swelling. MRI of the face and orbits with gadolinium revealed a small frontal subperiosteal abscess with osteomyelitis consistent with the diagnosis of Pott's puffy tumor (**Fig-3**). There was no evidence of intracranial extension. Intravenous antibiotics was changed to piperacillin/tazobactam and vancomycin with clinical improvement. After she was discharged with 4-6 weeks of outpatient intravenous antibiotics, the patient had clinical resolution along with resolution of the frontal abscess on repeat MRI (**Fig1B**).



Figure 1A



Figure 1B



Figure 2

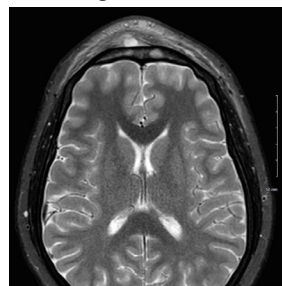


Figure 3

Discussion

Percivall Potts, surgeon at St. Bartholomew's Hospital in London, first described Pott's puffy tumor (PPT) in 1760 as "a puffy circumscribed, indolent tumor of the scalp and a spontaneous separation of the pericranium, from the skull under such tumor" which he observed after head trauma [1,2]. Additional causes include acute sinusitis and rarely after an insect bite, cocaine abuse, dental infection or fibrous dysplasia [3]. Today, it is considered a complication of frontal sinusitis with associated osteomyelitis and subperiosteal abscess. It is frequently seen in adolescents, typically with a male predominance [3].

Classic symptoms are fever, rhinitis, headache, vomiting, lethargy, localized tenderness of the forehead but as in our case, the presentation can be subtle and atypical [1,4]. While our patient did have mild forehead tenderness with induration, the other characteristics (fever, headache, rhinitis, drainage) were not present and her predominant exam finding was preseptal edema, leading to the initial diagnosis of preseptal cellulitis.

Early diagnosis is key to prevent intracranial extension – the most feared complication. Persistent fever, periorbital swelling, symptoms of raised intracranial pressure (headache, lethargy, vomiting, papilledema) or clinical worsening despite antibiotic therapy necessitates further investigation for intracranial extension such as brain abscess, subdural or epidural empyema, meningitis, or thrombosis of cortical veins [1,3,4].

The organisms found in acute and chronic bacterial sinusitis are often implicated in PPT such as *Staphylococcus aureus*, *Streptococcus* species, nontypeable *Haemophilus influenzae*, *Moraxella catarrhalis*, anaerobes and it is often polymicrobial [1,5]. Contrast-enhanced CT scan is the diagnostic modality for PPT. However in our case, the MRI was more sensitive in diagnosing the subperiosteal abscess and is considered the gold standard for diagnosing intracranial complications [3].

In conclusion, Pott's puffy tumor is a serious condition that can develop secondary to acute, chronic sinusitis or trauma and can lead to life threatening complications of intracranial extension of the infection. Early diagnosis is important, as surgical intervention may be required. PPT can range in severity, and may only present with minimal eyelid swelling and mild forehead tenderness. Clinicians should have a high index of suspicion and low threshold to re-image in any case of preseptal cellulitis unresponsive to IV antibiotics.

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