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Pott's Puffy Tumor: It's not a Tumor but it Can be Lethal (2 Cases Report)

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Abstract | **Case Report**

The Pott's puffy tumor has become an infrequent entity since the advent of antibiotic therapy. It is defined as a subperiosteal abscess arising from frontal bone osteomyelitis. We report two cases of PPT due to intreated frontal sinusitis and confirmed by computed tomography scan. Early surgery associated with long-term intravenous antibiotics is required to obtain a good recovery and prevent life-threatening intracranial complications.

Keywords: Pott's puffy tumor, frontal sinusitis, frontal swelling, osteomyelitis, antibiotics, endoscopic sinus surgery.

INTRODUCTION

The Pott's puffy tumor has become an infrequent entity since the advent of antibiotic therapy. It is defined as an inflammatory pseudotumor due to osteomyelitis of the frontal sinus responsible for the erosion of its anterior table and a subperiosteal abscess [1]. Percival Pott was the first to describe it in the 18th century [2]. It often affects the adolescent and the immuno-deficient. The patient presents with inflammatory frontal swelling, fever, frontal headache and purulent rhinorrhea [3].

The PPT is a dangerous complication, because if misdiagnosed or inappropriately treated it can lead to life-threatening intracranial complications such as meningitis, epidural or subdural empyema, and brain abscess [4].

Computed tomography confirms the diagnosis and looks for intracranial complications [3,4]. Surgery associated with long-term intravenous antibiotics are required to obtain a good recovery [5].

We report 2 clinical cases of adults with Pott's puffy tumors secondary to untreated frontal sinusitis. The aim of this work was to discuss the diagnostic workup and the therapeutic features of this pathology.

CASES REPORT

Case 1:

We report the case of a 22-year-old man with a medical history of poorly managed chronic frontal sinusitis, who presented seven days previously with painful frontal swelling with headache and purulent rhinorrhea associated with bilateral nasal obstruction and fever. The physical examination on admission showed a renitent frontal mass painful on palpation measuring 4x5 cm associated with eyelid edema (figure 1). Anterior rhinoscopy found an inflamed nasal mucosa and purulent nasal discharge. The neurological examination was normal. Biological tests showed a white blood cell count of 17400/mm3 and a C-reactive protein of 143.5mg/l.

The computed tomography showed an aspect of frontal cellulitis with an abscess under the periosteum measuring 24x8mm secondary to bilateral frontal sinusitis with lysis of the external table of the frontal sinus (figure 2).

The same day the patient benefited from an evacuating puncture of his abscess under ultrasound guidance which removed 20cc of pus. Subsequently, intravenous dual antibiotic therapy (amoxicillin + clavulanic acid and ciprofloxacin) was included with nasal decongestion and analgesic treatment. A week later, the patient underwent endoscopic sinus surgery.

The culture grew Streptococcus constellatus. The antibiogram confirmed the sensitivity of this germ to the antibiotic therapy already maintained and which was continued for 6 weeks.

A follow-up two weeks later confirmed the completely improved condition of the patient, and there

has been no recurrence after 3 years of follow-up (figure3).

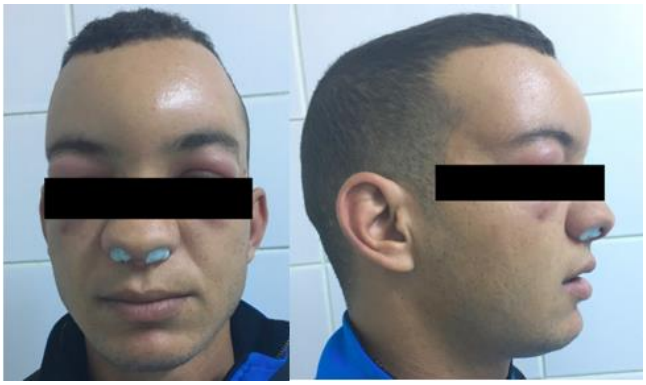

Figure 1: frontal and lateral view of fluctuant swelling over the left frontal area with eyelid edema

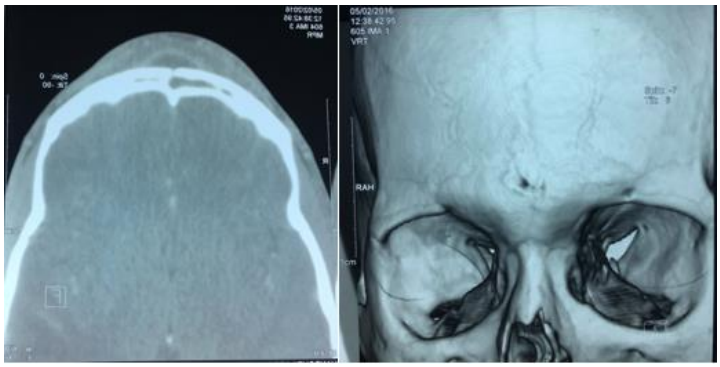

Figure 2: CT scan of brain showing frontal sinusitis and periosteal abscess of the frontal bone with lysis of the external table of the frontal sinus

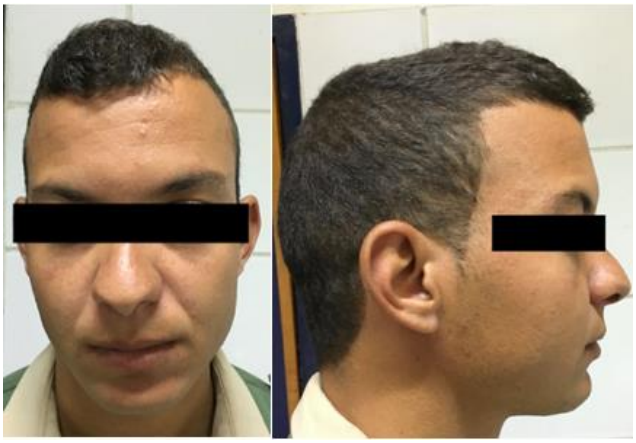

Figure 3: frontal and lateral view of the face after recovery

Case 2:

The fifty-year-old patient was followed for chronic pan-sinusitis, who presented for 10 days a painful frontal swelling associated with purulent rhinorrhea, physical asthenia, and fever at 38.5ºC. The admission examination found a painful renitent left frontal mass measuring approximately 2cm in the long axis (figure 4). Anterior rhinoscopy showed inflamed mucosa and purulent secretions in the middle meatus. The rest of the clinical examination was normal. The biological assessment showed a white blood cell count of 16500/mm3 and a C-reactive protein of 150mg/l. the CT scan of the sinuses showed an infiltrated appearance of the soft tissues next to the frontal sinus as well as a lysis of its external table associated with left frontal sinusitis (figure 5).

A puncture of the abscess under ultrasound guidance was carried out for bacteriological study and the culture of which revealed a proliferation of Staphylococcus Aureus. Two intravenous antibiotics were administered (amoxicillin + clavulanic acid and ciprofloxacin) with nasal decongestion and analgesic treatment. The antibiotic therapy was continued for 6 weeks.

A follow-up two weeks later confirmed the completely improved condition of the patient, and there has been no recurrence after 3 years of follow-up.

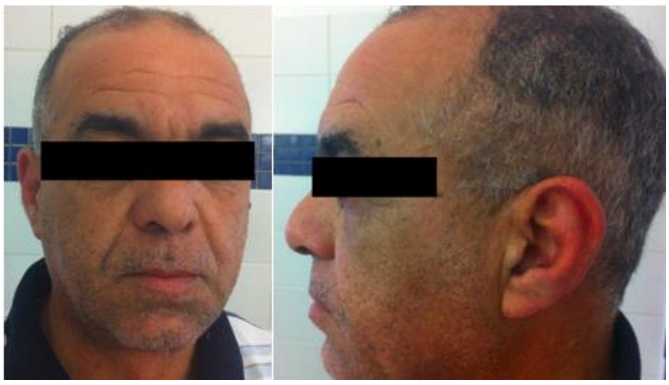

Figure 4: frontal and lateral view of fluctuant swelling over the left frontal area

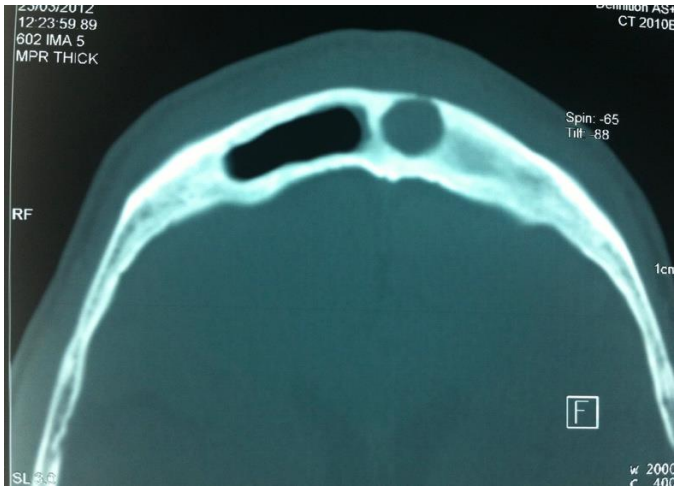

Figure 5: CT scan of brain showing left frontal sinusitis with lysis of the external table of the left frontal sinus

DISCUSSION

The Pott's puffy tumor was first described by an English surgeon, Sir Percival Pott, in the late 18th century, as a complication of a frontal trauma [6]. He explained it in his own words as "a puffy, circumscribed, indolent tumor of the scalp, and a spontaneous separation of the pericranium from the skull under such a tumor" [1]. Subsequently, he described it as a complication of frontal sinusitis in 1775 [7].

Pott's puffy tumor is a, circumscribed, indolent tumor of the scalp, and more precisely it is a frontal osteomyelitis with a periosteal abscess of the frontal bone [8]. This abscess is due to the erosion of the anterior table of the frontal bone, it has a circumscribed aspect due to the adhesion between the periosteum and the bone.

This entity affects all ages with a high incidence in adolescence and a clear male predominance, with a sex ratio of 9:1 [9].

The most common etiologic factor of PPT is frontal sinusitis and head trauma [6, 7]. Other rare etiologies are methamphetamine use, cocaine abuse, insect bite, or fibrous dysplasia [4].

The diagnosis of the Pott tumor is suspected of fluctuating painful frontal swelling with fever and associated with purulent rhinorrhea and orbital edema or even orbital cellulitis in a patient with a history of frontal sinusitis or trauma of this region [2, 3, 6, 7].

Since the era of antibiotics, PPT has become a very rare entity. Due to this rarity, the diagnosis is often delayed which favors the development of very serious or even fatal intracranial complications. These complications are found in 60% of cases and they include intracranial abscess, subdural empyema, cavernous sinus thrombosis, or meningitis [10]. These complications are often associated with the following clinical signs: fever, convulsions, headache, vomiting, and Focal neurological deficits.

Brain computed tomography remains the gold standard exam to confirm the diagnosis of PPT. It reveals the presence of osteomyelitis of the external wall of the frontal sinus and it looks for intracranial complications [7]. CT scan can show frontal sinusitis,

bone erosion, subperiosteal collection, and intracranial or intraorbital extension. The MRI is the exam of choice to delineate the intracranial extension, it provides a superior soft tissue resolution and more detail in the description of the subdural space and brain [11].

These subperiosteal abscesses are often polymicrobial. The culture allows a microbiological diagnosis of the Pott's puffy tumor in 50% of the cases and it can isolate the responsible germs that are often the same organisms causing chronic sinusitis: the streptococci, the staphylococci, and the anaerobes. Other germs such as proteus, fusobacteriums, and Pseudomonas are rarely involved [4, 6-9]. The culture can be sterile in 50% of cases especially if a probabilistic antibiotic therapy has been started before [6].

The treatment of PPT is based on a broad-spectrum intravenous antibiotic with good bone and blood-brain barrier penetration. This documented antibiotic therapy is maintained for at least 6 to 8 weeks and is associated with functional endoscopic sinus surgery. ESS involves opening the frontal sinus drainage pathway with a Draf frontal sinusotomy procedure [7, 9, 11].

For intracranial complications, surgical treatment options may combine an external approach, including craniotomy, with ESS. in order to be able to eradicate the infectious focus, eliminate necrotic tissues, and restore the permeability of the frontal canal [11].

Currently, given the development of endoscopic techniques, this approach has become a safe and effective alternative to the external route, and it gives similar results without leaving an external scar on the face skin.

CONCLUSION

PPT is a rare entity due to a subperiosteal abscess of the frontal bone, often secondary to a complication of frontal sinusitis.

Once the diagnosis of PPT is suspected, it must be immediately confirmed by craniofacial imaging (CT or MRI).

Early surgery associated with long-term intravenous antibiotics is required to obtain a good recovery and prevent life-threatening intracranial complications.

Endoscopic sinus surgery is a safe and less invasive surgical procedure that gives good results without leaving a facial scar.

Abbreviations:
PPT: Pott's Puffy Tumor.
CT: computed tomography.
MRI: magnetic resonance imaging.
ESS: endoscopic sinus surgery.

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