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CASE REPORT

Pott's puffy tumor in pediatrics, a rare complication of rhinosinusitis: a case report and literature review

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Abstract

Potts Tumor is a clinical entity, characterized by osteomyelitis of the frontal bone and subperiosteal abscesses. This pathology is a potential complication of rhinosinusitis, but it can also be caused by head trauma, intranasal drug abuse, and dental diseases. In a public hospital in the extreme south of Brazil, a case of this rare condition was diagnosed in a 10-year-old child. Despite the complicated presentation, which included subdural empyema and pachymeningitis, the treatment chosen was based on antibiotic therapy, lasting 22 days, and a single puncture to reduce the frontal abscess. The conduct selected in this case can be used to analyze the necessity of surgical procedures, once it can indicate that antibiotic therapy may be sufficient, even in complex cases. This article is a case report which aims to describe the measures adopted, analyzing different treatments and its indications. A review of literature on the topic is also carried out, which can contribute to the existing information about the pathology.

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INTRODUCTION

Pott's puffy tumor (PPT) is a rare clinical entity characterized by osteomyelitis of the frontal bone, with one or more communicating subperiosteal abscesses. This pathology is a potential complication of frontal or ethmoidal rhinosinusitis, but can also be associated with head trauma, intranasal drug abuse, and dental diseases. When caused by bacterial colonization, it is usually due to more than one microorganism, including mainly *Streptococcus* (35.5%), *Staphylococcus* (21.2%), *Fusobacterium* (5.3%), *Pseudomonas* (3.4%), and *Prevotella* (2.2%)¹.

This comorbidity manifests with a localized swelling on the head, face, or periorbital region, with inflammatory signs. Associated symptoms include headache, photophobia, rhinorrhea, fever, nausea, vomiting, lethargy, seizures, and focal neurological deficits, if there is cerebral involvement². The infection can migrate from the sinuses to the periorbital space and result in orbital cellulitis or orbital abscess. Moreover, it can reach the intracranial space through the diploic veins and result in the formation of epidural abscesses, subdural abscesses, meningitis, and encephalitis³.

PPT is usually treated with antibiotics and associated with a surgical intervention. Endoscopic or open surgical intervention, with or without external drainage, are techniques commonly required after medical treatment². We are reporting a PPT case occurred in a hospital in the extreme South of Brazil, with a brief review of the literature.

CASE REPORT

A 10-year-old female patient, previously healthy and not taking any continuous medications, reported headache and facial edema, with a fever of 38°C, during five days. She

presented previously an upper respiratory tract infection, which was treated with amoxicillin and clavulanate, without improvement. After three days, she developed bilateral periorbital edema, photophobia, headache, and fever. Ceftriaxone, hydrocortisone and promethazine were prescribed, with partial improvement of the periorbital edema.

On physical examination, she presented bilateral periorbital edema and edema in the frontal region, with pain on palpation, without associated inflammatory signs. Laboratory tests on admission showed mild leukocytosis, predominantly segmented, and C-reactive protein of 170.3 (reference value: <10 mg/L). A contrast-enhanced computed tomography (CT) scan of the face and orbits was requested, showing acute inflammatory/infectious, pansinusopathy, with bilateral periorbital and frontotemporal cellulitis, frontal subgaleal abscess, and left frontal subdural edema (Figure 1).

Intravenous vancomycin and metronidazole were combined with ceftriaxone, in addition to nasal lavage with saline solution. A contrast-enhanced magnetic resonance imaging (MRI) of the brain was performed, demonstrating the presence of an abscess determined by continuity of the frontal sinus with the subcutaneous cellular tissue, subdural empyema in the left frontal convexity, and signs of pachymeningitis (Figure 2). Given the imaging findings and the patient's clinical condition, a diagnosis of PPT was made.

After eight days of intravenous antibiotics, without reduction of the abscess, 25 mL of pyohematic content was drained by frontal puncture. Cultures were collected, which showed no bacterial growth. Six days later, a new CT scan of the brain with contrast was performed, indicating a significant reduction in the frontal subgaleal collection.

The patient was hospitalized for 25 days, under conservative treatment. Antibiotic therapy lasted 22 days. A MRI with contrast of the brain performed before hospital

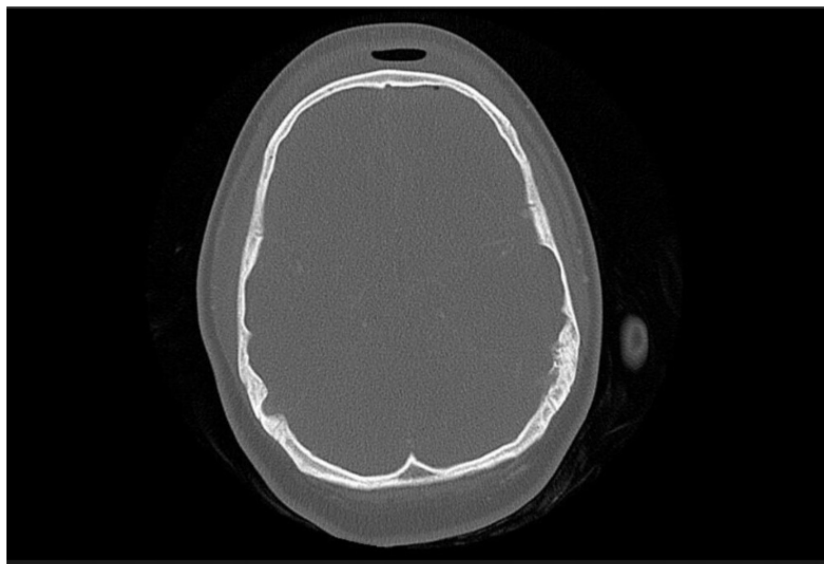


Figure 1. Tomographic image showing frontotemporal cellulitis.

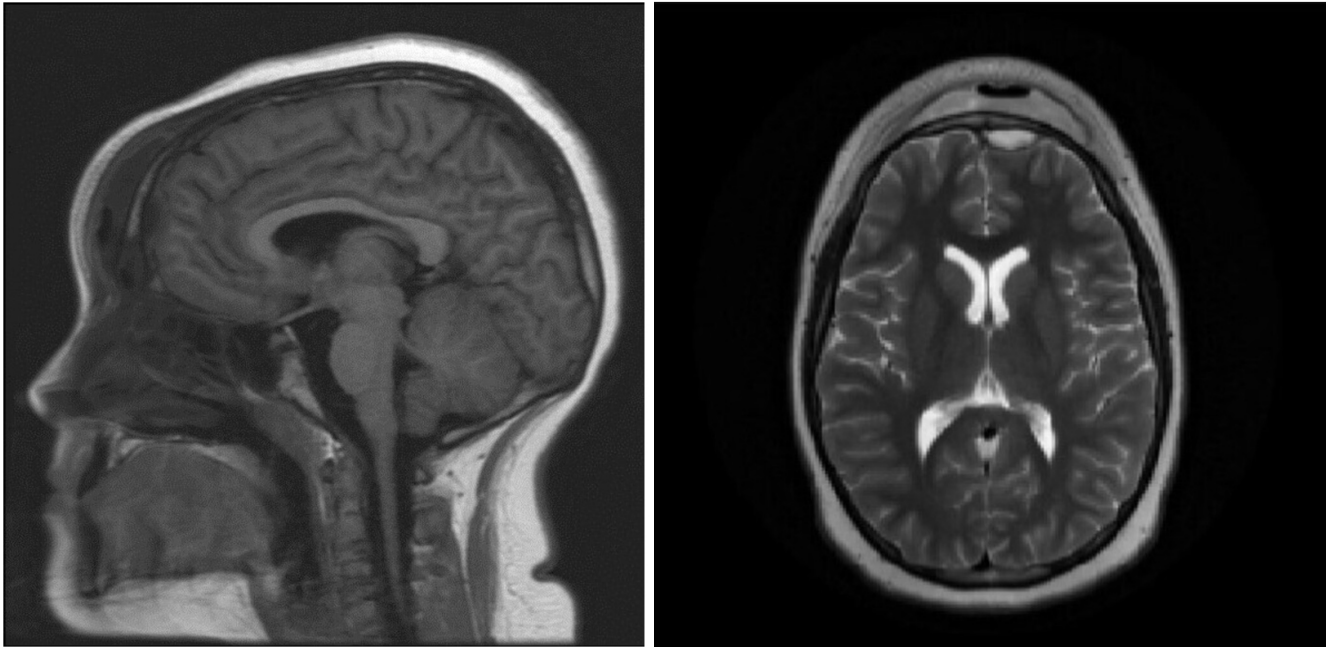


Figure 2. Contrast-enhanced MRI showing a frontal abscess, a subdural empyema in the left frontal convexity and signs of pachymeningitis.

discharge showed only inflammatory sinusitis. The patient was discharged with a prescription for amoxicillin with clavulanic acid for two weeks. One week after discharge, she was asymptomatic.

DISCUSSION

PPT is a rare complication of chronic rhinosinusitis, in which the infection invades the tissues and frontal bone with the formation of a subperiosteal abscess and frontal osteomyelitis.⁴ The disease is more common among adolescents due to the increased blood flow of the diploic veins that drain the frontal sinus in this period of life, the less compact connection between the bone marrow and the frontal sinuses and the incomplete pneumatization of the nasal sinuses until the age of 15.⁵ Its clinical presentations are varied, but progressive swelling of the frontal tissues is characteristic of the disease and may be accompanied by headache, fever, fatigue and inappetence.^{5,6} In complicated cases with intracranial involvement, patients may present symptoms characteristic of meningitis, encephalitis, brain abscess and Increased Intracranial Pressure (ICP). In addition to sinusitis, other facilitating factors can lead to the development of PPT, such as a history of neurosurgery, trauma, dental infections, drug abuse and immunosuppression.⁵ The most common natural history of the disease is the evolution of an unresolved sinusitis infection caused by bacteria from the streptococcus and staphylococcus families and most diagnoses are late, after the appearance of swelling in the frontal region and/or intracranial involvement with neurological symptoms.^{6,7}

Imaging tests are commonly used to confirm the diagnosis, with computed tomography and magnetic resonance imaging being the most commonly used to assess the extent of disease and intracranial involvement.⁵

There is a wide range of treatments available for PPT, although there are no established guidelines. Endoscopic or open surgical treatment aims to drain the secretion, repair the affected bone, and sometimes perform sinus surgeries. Despite this, broad-spectrum intravenous antibiotics are frequently used.⁸ In this case, treatment with antibiotics, ceftriaxone, vancomycin, and metronidazole, and frontal puncture was performed, and no surgical intervention was carried out. The indication for surgical procedure is not clear, and we can observe in a case report with characteristics similar to our patient that the resolution of the case, after surgical procedure, was similar 9, although, in this case, there was no associated surgical risk. It is worth noting that the minority of cases, about 5% according to a recent systematic review, were treated with antibiotics alone 8, highlighting the exceptional nature of this report.

CONCLUSION

In the present case, conservative management was chosen, even with involvement of the meninges, under a regimen of intravenous antibiotic therapy and a puncture to reduce the volume of the abscess. This case can be considered as an example of conduct, demanding a careful evaluation of the need for surgical intervention in complicated cases.

We conclude that PPT is still a complication little known to doctors due to its late diagnosis rate and that more studies are needed to establish conformity in its treatment, especially as regards the use of a conservative or surgical approach.

ADDITIONAL INFORMATION

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