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Case Report

Pott's puffy tumor on an exceptional clinical case: review of the literature

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ABSTRACT

Pott's tumor or Pott's puffy tumor or osteomyelitis of the frontal bone is a rare clinical presentation. It usually occurs as a complication of trauma to the frontal region, frontal sinusitis or by blood-borne spread, the infection can also spread inwards leading to an intracranial abscess. This is a 04-month-old, 7 kg infant with left frontal swelling with ipsilateral orbital extension. This swelling had been evolving for approximately 1 month. The computed tomography showed a hypodensity of liquid in the left fronto-orbital subcutaneous topography with an intense annular parietal enhancement in the arterial and late stages. Treatment consisted of surgical drainage under general anesthesia. We made the incision via the left pterional approach and undermining up to the frontal bone. From the pus about 40 cc then we proceeded to the debridement of necrotic tissues and curettage of the frontal bone which was lysed in places. The germ found was *Burkhoderia pseudomallei* gram-negative bacillus sensitive to C3G. Pott's tumor is a rare complication most often from untreated or poorly treated frontal sinusitis. This lack of knowledge raises fears of an evolution towards intracranial complications that could be life-threatening for patients.

Keywords: Pott tumor, Osteomyelitis, Infant, Rare infection

INTRODUCTION

Pott's tumor or Pott's puffy tumor or **o**steomyelitis of the frontal bone is a rare clinical presentation. It usually occurs as a complication of trauma to the frontal region, frontal sinusitis, or by blood-borne spread, the infection can also spread inward leading to an intracranial abscess.[1] Its complications can be life threatening as the early symptoms are subtle. Early diagnosis and appropriate management to prevent central nervous system complications significantly decrease morbidity and mortality.[2] The objective of this work is to review the literature through an exceptional clinical case due to the very young age of the patient and the therapeutic delay.

CASE REPORT

This is a 4-month-old infant, weighing 7 kg, with left frontal swelling with ipsilateral orbital extension. This swelling had been evolving for about 1 month, it was painful, of soft consistency, the skin opposite was shiny with an old incision, measuring 04cm in large diameter; in a febrile context of 38.5 °C, elsewhere there was a left chemosis without proptosis or ophthalmoplegia. We did

not find any notion of trauma; or neurological deficit. At the complete blood count (NFS), there was hyperleukocytosis 17,000 with neutrophilic predominance, anemia at 7 gm/dl microcytic, normochromic, and normocytic.

The computed tomography showed a hypodensity of liquid in the left fronto-orbital subcutaneous topography with an intense annular parietal enhancement in the arterial and late stages. It measures 49x42x29 mm or 32ml with the presence of underlying ipsilateral frontal irregular osteolysis. There is a thickening of the ipsilateral external right oculomotor muscle of 8 mm. No proptosis or intraocular infiltration. Absence of ischemic or haemorrhagic brain lesion or infectious or tumoral expansive process (Figure 1).

Treatment consisted of surgical drainage under general anesthesia. We performed the incision via the left pterional approach and undermining to the frontal bone. From the pus about 40 cc then we proceeded to the debridement of necrotic tissues and curettage of the frontal bone which was lysed in places (Figure 2). The procedure was well tolerated without incident. A double probabilistic antibiotic therapy was undertaken based on Ceftriaxone 1 G diluted in 10cc of solvent and 7.5 cc per day associated with Metronidazole 21cc IV every 12 hours for a week and readjusted after the result of the antibiogram. The germ found was *Burkhoderia pseudomallei* gram-negative bacillus sensitive to C3G. The relay was taken orally for 4 weeks. The evolution was favorable under treatment after two weeks with total remission of fever, chemosis and cessation of pus. With a follow-up of one year, we do not note any sign of ocular involvement.

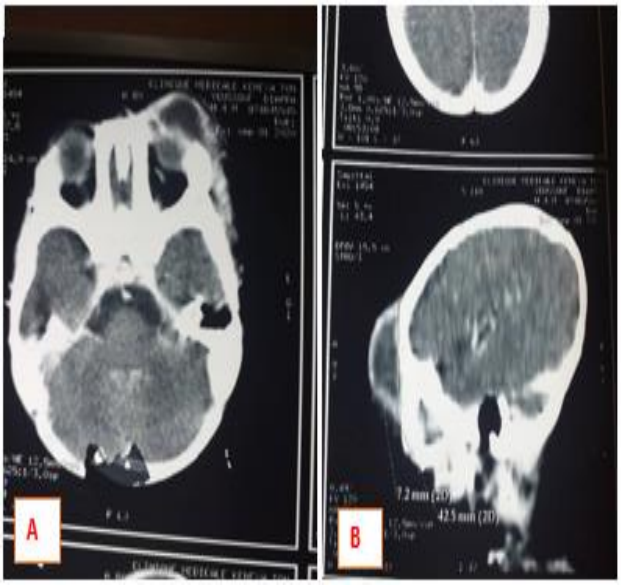

Figure 1 (A and B): CT of an abscessed collection left frontal subcutaneous estimated at 35 ml with osteolysis underlying and left oculomotor muscle infiltration external ipsilateral.

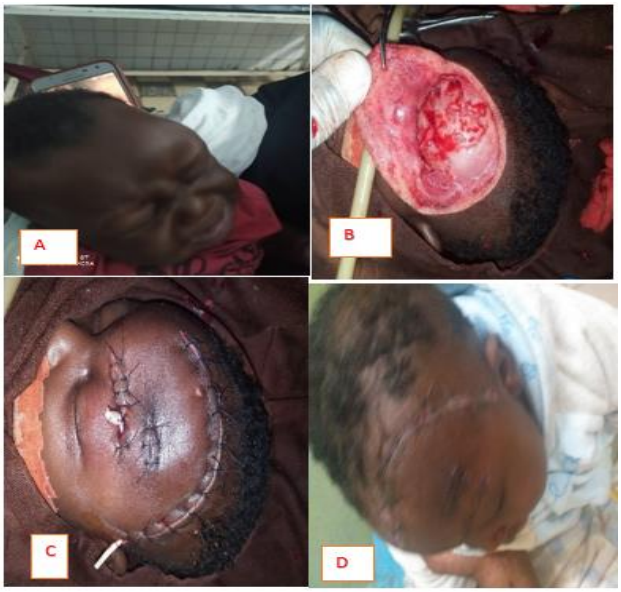

Figure 2 (A-C): Patient preoperatively, surgical drainage brought back about 40 cc of pus with lots of tissue necrosis and curettage of the frontal bone which was lysed in places, postoperative image, evolution after 3 weeks of post-surgery treatment.

DISCUSSION

Since the era of antibiotics, cranial and intracranial complications of sinusitis have become rare. These complications concern about 3 to 11% of patients with sinusitis.[3] In the literature, Pott's tumor most often occurs as a complication of frontal sinusitis or head trauma.[4] The prevalence of these conditions is found in adolescents. In newborns and infants, these cranial and intracranial suppurative collections are exceptional.[3,5,6]

Pott's tumor was first described by Sir Percivall Pott in the year 1768 and is defined as one or more subperiosteal abscesses of the frontal bone resulting in osteomyelitis.[4,7,8]

Although the initial presentation of this disease by Pott was in the context of trauma, more recently the cases described come mainly from frontal sinusitis.[4,7] Infectious spread can occur by many different mechanisms, but most often by direct extension through the frontal bone or as thrombophlebitis through the diploic veins, communicating directly with the dural venous plexus and allowing intracranial spread of the infection. At the same time, the anatomical features of the frontal sinus (that is, diploic valveless veins drain blood from the mucosa of the frontal sinus, spreading into the haversian system of the frontal bone) may be contributing factors to the development of Pott's tumor and its complications.[4]

After reviewing the literature, our clinical case seems to be a very early presentation of Pott tumor in a 4-month-old infant.[4-8] At birth, the growth of the frontal sinus is highly variable. It is only found in 1.5% of children under

one year of age in cadaveric and radiological studies. During this period, it is often small in size, and can even be considered an ethmoidal cell, hence its common anatomical and embryological relationship with the anterior ethmoidal cells.[9] The first pneumatization of the frontal sinus is rather a slow process, which begins in the first year of the child's life. The frontal sinuses are still small, smooth and blind cavities. The second process of pneumatization occurs between 1 and 4 years. From the age of 8, it continues to grow and pneumatize, thus being able to be noticed on most computed tomography (CT) scans. This pneumatization is accentuated in adolescence and continues until the age of 18.[10] This explains the high frequency in this age group.

As in our case, the classic presentation is that of a circumscribed, painless swelling of the scalp. The infection violates the anterior part of the table of the frontal bone which leads to an abscess between the bone and the periosteum leading to its circumscribed appearance due to adhesion between the periosteum and bone. [11]In addition to the etiology secondary to frontal or traumatic sinusitis, authors have also reported mastoiditis, insect bites, and acupuncture.[11-13]

The positive diagnosis is made by emergency imaging. Cerebral CT with injection of contrast product is the examination of choice to confirm the diagnosis. It shows frontal sinusitis, osteomyelitis in the form of bone erosion, abscess under periosteum and particularly intracranial extensions.[8,14,15] Cerebral magnetic resonance imaging (MRI) with contrast may represent the ideal examination if it is available and possible in an emergency because it better studies soft tissues and intracranial complications.[14,16] Bone scintigraphy can help in diagnosis especially in the early stage of osteomyelitis.[16]

In our case, we performed a CT scan with injection of contrast product which objectified liquid hypodensity in the left fronto-orbital subcutaneous topography with intense annular parietal contrast uptake in the arterial and late stages. It measures 49×42×29 mm or 32 ml. Presence of underlying ipsilateral frontal irregular osteolysis. There is a thickening of the ipsilateral external right oculomotor muscle of 8 mm, no proptosis or intraocular infiltration. Absence of ischemic or hemorrhagic encephalic lesion or infectious or tumoral expansive process.

Surgical management is variable and may require a multidisciplinary approach between neurosurgeons, ophthalmologists and otolaryngologists.[16] In accordance with the literature, we proceeded to surgical drainage by external route under general anesthesia with debridement of necrotic tissues and curettage of the frontal bone which presented erosions of the anterior wall of the frontal bone then a double probabilistic antibiotic therapy based on ceftriaxone 1 G diluted in 10cc of solvent and do 7.5 cc per day associated with metronidazole 21cc IV every 12 hours for a week readjusted after the result of the antibiogram. The germ found was *Burkhoderia pseudomallei* gram-negative bacillus sensitive to C3G. The relay was taken orally for 4 weeks.[16,17]

Bacteriology is most often polymicrobial, the most frequently incriminated germs are *Staphylococcus*, *Streptococcus* and anaerobes. More rarely, *Hemophilus*, *Aspergillus* and *Mycoplasma* can be observed.[14,15] In our case, it was monomicrobial. The germ found was *Burkhoderia pseudomallei*, a gram-negative bacillus sensitive to 3rd generation cephalosporin. We got the cure after 4 weeks of antibiotic therapy. With a follow-up of one year, we do not note any sign of ocular involvement or any other type of complication.

CONCLUSION

Pott's tumor is a rare complication most often from untreated or poorly treated frontal sinusitis. This lack of knowledge raises fears of an evolution towards intracranial complications that could be life-threatening for patients. Any frontal swelling, especially in a young patient, must receive special attention so as not to ignore this condition.

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