Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Radiology

Tuberculous Osteitis of the Cranial Vault: A Case Report

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DOI: https://doi.org/10.36347/sjmcr.2024.v12i09.029 | **Received:** 14.08.2024 | **Accepted:** 23.09.2024 | **Published:** 26.09.2024

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Abstract **Case Report**

Cranial tuberculosis is a rare condition, constituting 0.2 to 1.3% of bone tuberculosis cases, mainly affecting the frontal and parietal bones. It is often misdiagnosed. A case involved a two-year-old girl, F.R., who developed ulcerations on her scalp due to multifocal tuberculosis. Imaging revealed a hypoechoic collection and mixed lesions in the parietal area, leading to a confirmed diagnosis. Common symptoms in children include painless scalp swelling and sinus discharge. Imaging, particularly CT and MRI, is critical for diagnosis and treatment planning. Early detection is essential for effective management.

Keywords: Osteitis, Cranial Vault, CT, MRI, BK.

INTRODUCTION

Cranial vault tuberculosis is a rare form of tuberculosis affecting the bones of the skull, accounting for 0.2 to 1.3% of bone tuberculosis cases, so the diagnosis is often not initially suspected. It generally affects the frontal and parietal bones [1, 2].

Advanced medical imaging techniques, such as computed tomography (CT) and magnetic resonance imaging (MRI), play an essential role in the evaluation of cases of bony tuberculosis of the skull. These imaging modalities enable us to better characterize the extent and detail of affected bone lesions. They also enable us to identify any associated complications, such as meningeal involvement or the presence of intracranial abscesses. This detailed information provided by CT and MRI scans is crucial in guiding the diagnosis, disease extension and therapeutic management of these patients with cranial bone tuberculosis [2, 3].

Diagnosis is based on correlation of clinical, radiological and bacteriological (BK) [1].

PATIENT AND OBSERVATION

This is a two-year-old child, F.R., with no particular pathological history, followed for multifocal tuberculosis: pleuropulmonary and osteoarticular, who currently presents with multiple ulcerations of the scalp with pus discharge topped by a hemorrhagic crust and a visible swelling of the scalp on the poorly limited temporal area with infiltration opposite, evolving for 2 months. General condition preserved with apyrexia. Neurological examination was normal. An infectious biology workup was ordered, with hyperleukocytosis at 16700 and CRP at 123. An ultrasound scan of the scalp soft tissues was ordered and showed a heterogeneous oval hypoechoic collection of the right parietal soft tissues of the scalp, non-vascularized on color Doppler, fistulated to the skin and measuring 12x4.3 cm with an adjacent cortical murmur, and a craniocerebral CT scan, before and after injection of contrast medium, showed multiple mixed osteocondensing and osteolytic bone lesions with cortical rupture, some of which were visible throughout the skull, but more marked in the vault with the scalp collection already described on ultrasound, with no detectable intracerebral lesions. Anatomopathological study confirmed the tubercular nature of the lesion. The patient benefited from ant bacillary treatment and the evolution was favorable with recovery.

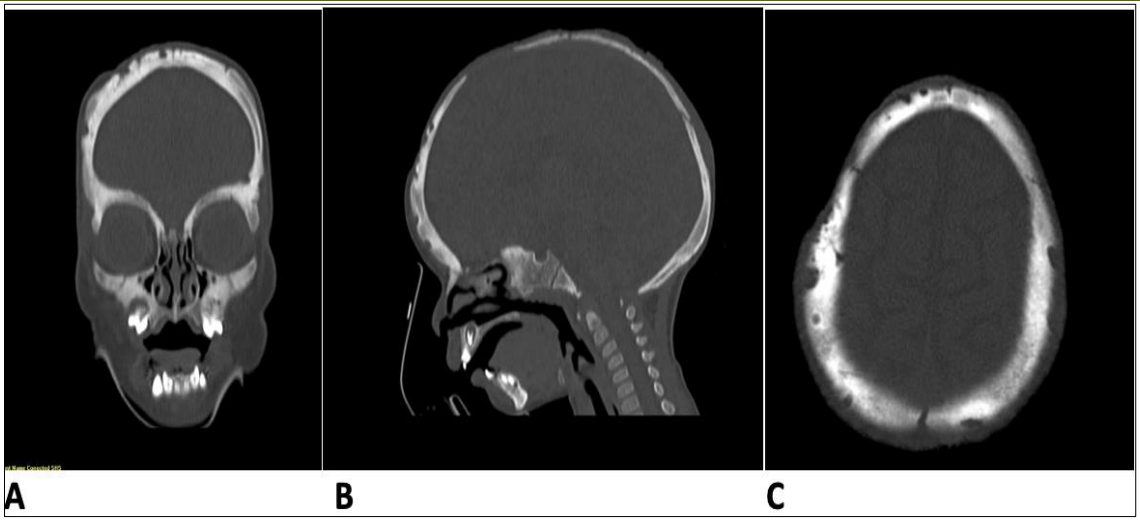

Figure 1: (A, B, C,): Spontaneous contrast brain CT, in coronal,sagittal and axial slices, showing: multiple mixed osteocondensing and osteolytic bone lesions with cortical rupture, some of which were visible throughout the skull, but more marked at the level of the arch with the scalp collection already described on ultrasound, with no detectable intracerebral lesions.

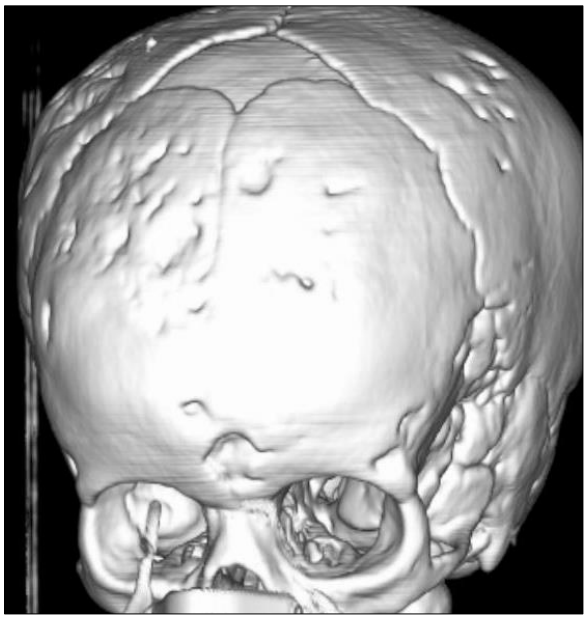

Figure 2: 3D image of CT showing multiple bone lesions visible throughout the skull, varying in size and shape.

DISCUSSION

Tuberculosis is a major public health problem in developing countries, and cranial tuberculosis is extremely rare, accounting for 0.2 to 1.3% of bone tuberculosis cases [1-4].

This is due to the absence of lymphatic propagation from a primary site, the skull being devoid of lymphatics, after colonization in the spongy and diploid spaces of the skull, further development depends on the virulence of the organism and the resistance of the host. Infection causes obliteration of capillaries and replacement of bone trabeculae by proliferating fibroblast granulation tissue. The outer table is destroyed first, although both tables are eventually affected. The parietal and frontal bones are most often affected, which has been attributed to the relatively greater presence of cancellous bone elements in these bones than in the other bones of the skull vault.

The occipital and sphenoid bones are rarely affected. Although the dura constitutes a solid barrier against intracranial spread, such spread is rarely observed. Meningoencephalic extension is exceptional, occurring in less than 5% of cases [1-4].

It generally affects children, 50% of whom are under the age of 10, and 75-90% under the age of 20 5 Painless swelling of the scalp and sinus discharge are common manifestations, but seizures and motor deficit

may rarely occur our patient presented with multiple scalp ulcerations [1-5].

Imaging plays an important role in the diagnosis of cranial tuberculosis, cranial tuberculosis can present in different radiological forms. The first is the perforating form of the skull, characterized by circumscribed osteolytic lesions with granulation tissue covering the internal and external bony tables. These lesions tend to remain limited in their extension, with no marked periosteal reaction.

Diffuse tuberculosis of the skull, on the other hand, manifests itself as extensive destruction of the internal bony table of the skull, associated with the presence of extradural granulation tissue, forming "disseminated" type lesions.

Finally, the circumscribed sclerotic type corresponds to reactive bone sclerosis, often accompanied by cold abscesses. This form is the least common of the three.

Differential diagnosis includes metastases, multiple myeloma, Paget's disease, histiocytosis, hyperparathyroidism and osteomyelitis. Diagnosis can be aided by CT and NMR imaging.

Computed tomography (CT) can reveal characteristic signs of cranial tuberculosis. These include soft tissue swelling accompanied by bony destruction of one or both tables of the skull, sometimes with bone sequestration. CT scans also show spread of the disease to the extradural space, meninges and brain parenchyma. Epidural granulation tissue or abscess appears as a crescent- or lens-shaped collection of low attenuation. The surrounding meninges become intensely enhanced after administration of a contrast medium. CT can also reveal signs of meningitis and parenchymal disease [5-7].

Magnetic resonance imaging (MRI) is particularly effective for assessing marrow involvement and the extent of soft-tissue lesions. Proton density and T2-weighted images show a signal-intensive soft tissue mass within the bony defect. This mass may project into the subgaleal and/or epidural spaces, and show peripheral capsular enhancement on the contrast-enhanced image. MRI is highly sensitive for demonstrating changes in the meninges and ventricular walls, and for detecting areas of parenchymal involvement. In addition, largely liquefied soft tissues appear minimally hyperintense on T1-weighted images, which can be a clue to the diagnosis of tuberculosis. The edges of abscesses may also be hyperintense on T1-weighted images, while bone fragments and calcified foci may produce hypointense areas [8-10].

CONCLUSION

Cranial tuberculosis is a rare but serious disease requiring early diagnosis and management. Imaging, particularly CT and MRI, plays a key role in characterizing bony lesions, assessing extension to soft tissues and meningeal spaces, and guiding differential diagnosis.

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