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Case Report

Cerebral actinomycosis following a facio-cranial trauma: A case report[☆]Khaoula Oukrid, MD^{a,b,*}, Hamid Ziani, MD^{a,b}, Chaymae Ziani, MD^{a,b}, Siham Bhallil, MD^{a,b}, Siham Nasri, MD^{a,b}, Imane Kamaoui, MD^{a,b}, Imane Skiker, MD^{a,b}^a Radiology Department, Mohammed VI University Hospital, Oujda, Morocco^b Mohammed First University Oujda, Faculty of Medicine and Pharmacy, Oujda, Oujda Morocco

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ABSTRACT

Cerebral actinomycosis is a rare, chronic, but curable bacterial brain infection. We report the case of an 18-year-old male patient with a history of facio-cranial trauma, admitted in our institution with severe headaches and behavioral disorders. Magnetic resonance imaging (MRI) was performed showing the presence of contiguous multiple small round and ovoid lesions in the right frontal lobe with “the dot in circle” appearance. The diagnosis of cerebral actinomycosis was confirmed by histological study of the biopsy sample. Despite it being a rare condition, it is important to consider this diagnosis in patients with atypical post-traumatic neurological symptoms.

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Introduction

Actinomycosis is an uncommon chronic suppurative infection rarely affecting the central nervous system caused by filamentous Gram positive anaerobic bacteria that is a normal commensal but causes suppurative and granulomatous inflammation following disruption of anatomical barriers [8]. Through this case, we would like to illustrate the MRI patterns of cerebral actinomycosis and to review the existing literature describing similar cases.

Case report

An 18-year-old male was admitted to our institution with a 5 months history of severe headaches, and behavioral disorders. The patient had experienced a facio-cranial trauma 6 months prior to his presentation resulting in the loss of the right eye and multiple orbital fractures. The patient had received multiple courses of analgesic treatment from various healthcare providers without improvement.

On examination, the patient was not febrile, he presented a slight left-sided weakness and manifested cognitive impairment. Laboratory investigations, including complete blood count, and C-reactive protein, showed no significant abnor-

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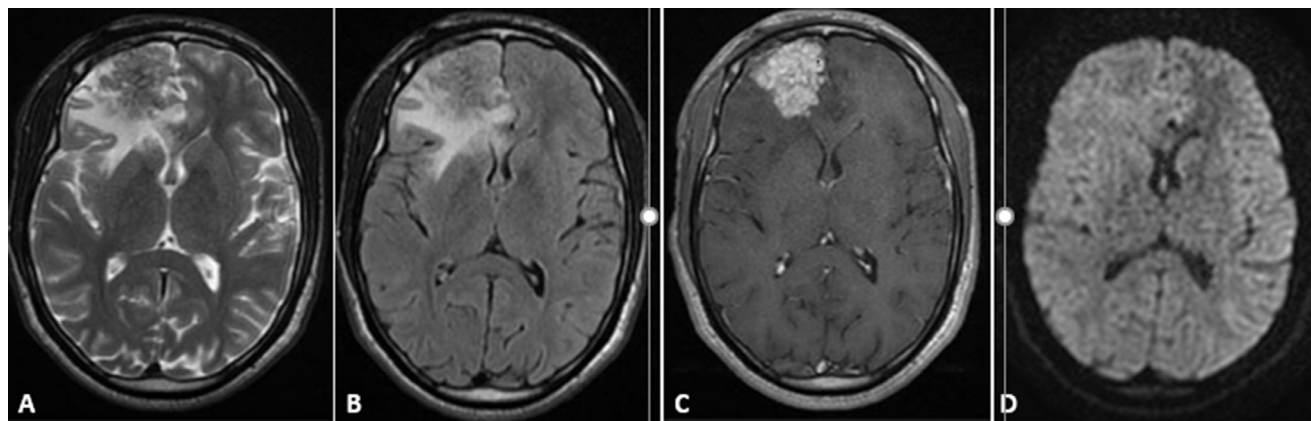


Fig. 1 – T2 weighted sequence, the lesions are hyperintense with a hypointense peripheral border describing the “dot in the circle” sign surrounded by perilesional oedema (A), FLAIR sequence, the lesions are hyperintense with a hypointense peripheral border (B) Contrast enhanced T1-weighted sequence, ring and nodular enhancement of the lesions (C), there is no diffusion restriction (D).

mal. Lumbar puncture was not performed. A brain MRI was performed showing the presence of contiguous multiple small round and ovoid lesions in the right frontal lobe. These lesions were heterogeneously hyperintense on T2-weighted images with a hypointense peripheral border describing the “dot in the circle” sign, without diffusion restriction. The lesions were surrounded by an important perilesional oedema. On contrast enhanced T1-weighted images, the lesions showed ring and nodular enhancement (Fig. 1).

To establish a definitive diagnosis, a biopsy was performed. Histopathological examination revealed the presence of characteristic sulfur granules and filamentous bacteria. The diagnosis of cerebral actinomycosis was made, then decision the patient underwent intravenous antibiotics before a surgical debridement.

Discussion

Actinomycosis is a rare subacute or chronic, endogenous infection mainly by *Actinomyces* species, showing low virulence through fimbriae and biofilms [1]. Cervico-facial, thoracic, abdominal, pelvic and sometimes cerebral, laryngeal, urinary, and other regions can be affected. It rarely involves the central nervous system, with infection of this site occurring in 2–3% of actinomycotic infections [2]. It may produce brain abscess, meningitis, subdural empyema, as well as spinal and cranial epidural abscess [3]. Development of actinomycosis needs disruption of the mucosal barrier or another bacterial infection [4]. Cerebral infections are reported following direct trauma, hematogenous or contiguous spread from infection or a local spread from ENT (ears, nose, and throat) infection [5]. The most notable risk factors having been described are chronic sinusitis, mastoiditis, gingivitis, and dental procedures, congenital heart diseases, infected intrauterine devices, and alcoholism [6]. Clinical presentation may vary from mild headache to focal neurological deficit depending upon the intracranial location of the lesion. There are no specific imaging finding for this disease. It may present as ring enhancing lesion, pachy-

meningitis or mass lesion with or without bone involvement [7]. Histopathological examination forms the cornerstone of the diagnosis as culture turns out to be negative in majority of the cases. The bacterial filaments are typically gram positive and nonacid-fast. Few colonies are usually surrounded by an eosinophilic rim [1]. There is lack of established standards for antimicrobial treatment in actinomycosis, especially with the central nervous system involvement. Long regimens are often necessary [8].

Conclusion

Cerebral actinomycosis is a rare but potentially serious infection that should be considered in patients with atypical neurological symptoms, accompanied by risk factors. Imaging plays an important role in topographical and differential diagnosis and guides the surgical approach for anatomopathological examination. Early recognition, appropriate diagnostic imaging, surgical intervention when necessary, and prolonged antibiotic therapy are crucial for successful management.

Patient consent

Informed consent was obtained from the patient included in this case report for the publication of their clinical details, images, and any potentially identifying information. A copy of the written informed consent is available for review by the editorial team of this journal.

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