ORIGINAL ARTICLE

TUBERCULOUS ABSCESS IN THE CEREBELLOUS HEMISPHERE NEUROSURGICAL RESOLUTION OF A RARE INJURY

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SUMMARY:

Typically the etiological agent of tuberculosis is Mycobacterioum Tuberculosis , contagion is inter-human and the primary lesion is pulmonary .
CNS involvement is a serious manifestation of the disease, being more frequent in HIV - positive patients , chronic alcoholism, malnutrition, DBT and other states of immunosuppression .
Dissemination is via the hematogenous route and to reach the CNS it must cross the blood - brain barrier through the mechanisms of cell translocation or non - lysis .
The most frequent clinical presentation is exudative , proliferative and necrotizing meningoencephalitis . Next in frequency are tuberculomas that express a relative preservation of the immune response. Finally , tuberculous brain abscesses are very rare, they come from a previous state of cerebritis , they are granulomatous encapsulated lesions that contain necrosis, bacilli and macrophages with perilesional edema inside. increasing thus the mass effect .
brain imaging studies of CT and MRI, the enhancement of the brain is characteristic . d ring-shaped contrast with neurotic center and perilesional edema .
- infection with HIV significantly increases this type of presentation by 20% . Likewise, the co - morbidities of the patient increase the clinical severity and mortality.
The Gold Standard in surgical treatment is exeresis of the abscess , although in certain locations that are not accessible to surgery it may be necessary . perform less invasive techniques such as puncture evacuation and sampling for cultures and pathological anatomy by stereotaxy or neuronavigation . In addition to systemic treatment for tuberculosis , which would correspond to systemic medical treatment.
We present an operated case of tuberculous abscess in the left cerebellar hemisphere , in a female patient , 46 years old, HIV positive .

KEY WORDS: Tuberculosis, Abscess, Mycobacterium

INTRODUCTION:

Most of the tuberculosis disease in humans is due to Mycobacterium Tuberculosis. Interhuman contagion is typical.
CNS involvement is a serious manifestation of the disease.
HIV -positive patients , child malnutrition, alcoholism, malignant neoplasms, states of immunosuppression , DBT, among others, are more likely to suffer from this presentation .
Mortality risk increases with older age, HIV- positive co -infection, intracranial hypertension, hydrocephalus , space-occupying lesion with significant mass effect, and brain herniation .
The invasion of the CNS is established by two possible routes. On the one hand by hematogenous dissemination using the mechanism of translocation or cell lysis. The other mechanism is that they are transported by phagocytes. Both from the progression of a primary pulmonary infection or reactivation of late tuberculosis lodged in other organs.
When there is a high load of bacilli in the blood, they form multiple granulomatous foci adjacent to the ependyma or pia mater, known as Rich 's foci that produce caseum and when they break, they release bacilli

into the subarachnoid space , which are then largely internalized in the microglia.
The clinical presentation is 95% meningoencephalitis, 2 to 5% tuberculomas and 0.5 to 2% abscesses. In TBC and HIV co-infection, the abscessed form rises to 20%.
Tuberculous meningitis consists of an exudative, proliferative and necrotizing inflammatory reaction in the subarachnoid cisterns . It can debut as isolated pachymeningitis with focal or diffuse thickening of the dura mater and arachnoid.
Tuberculomas are located in the periventricular white matter , they are focal lesions with or without central caseating necrosis , representing a relative preservation of the immune response.
The abscesses are located at the interface of gray matter and white matter, located in the cerebral hemispheres, brainstem or cerebellum. They come from a previous cerebral stage with a large inflammatory component and vasogenic edema . They are encapsulated lesions consisting of thick-walled granulation tissue, may be polylobulated , generally exceed 3 cm in diameter, and are usually single. Its content is acid-alcohol-fast bacilli, necrosis and macrophages . Associated with vasogenic edema perilesional that increases even plus the effect of intracranial mass.
Clinical suspicion of tuberculous abscess is made before the beginning of neurological deterioration , or of some neurological focus in a patient with treatment for tuberculosis, where the request for an imaging study is imperative. brain ly always prior to performing a lumbar puncture. It is rarely evidenced as a finding in imaging studies .
Non-contrast brain CT shows an expansive lesion with displacement and compression of nerve structures with surrounding edema. The contrast enhances the ring-shaped lesion with hypodensity inside due to necrosis and outside due to edema.
MRI shows an expansive lesion with displacement and compression of nerve structures with hyperintense surrounding edema on T2 and FLAIR sequences . R restricts diffusion. In T1 with contrast, there is evidence of ring enhancement with central and peripheral hypointensity.
The use of antiedematous drugs has its benefits in the early stages after diagnosis , prioritizing the administration of hypertonic solutions and mannitol before corticosteroids. Medical - surgical treatment It depends on multiple factors , fundamentally on the response of the bacillus-host relationship.
In case of deep lesions or those located in eloquent areas, stereotaxic biopsy is indicated. or by neuronavigation , with aspiration evacuation of the lesion, sending the samples to pathological anatomy and cultures, as well as direct examinations of the same . On the other hand, in accessible lesions of considerable size , with a mass effect, excision is recommended, which is the GOLD STANDARD in neurosurgical treatment . In small injuries without clinical and imaging repercussions, expectant management of evolution can be advised as long as the diagnosis it is already objectified .
Undoubtedly, the follow-up of these patients is multidisciplinary , both from non- medical personnel such as nurses, kinesiologists instrumentalists quir ; urgencies , etc. and doctor , infectologists , pulmonologists , intensivists , imaging specialists , clinicians and pathologists.
Many of these patients already come with a diagnosis of tuberculosis and are receiving treatment. If this is not the case, it is recommended to first start with an empirical treatment, contemplating the range of infectious possibilities . Although it is always preferable to take samples and even perform surgery before starting medical treatment , to increase the possibility of rescuing germs. The multiplicity of systematic opportunistic co - infections in HIV-positive patients must be taken into account, where an exhaustive clinical and imaging analysis is required .

OBJECTIVES:

Analyze the different types of lesions that Mycobarterium Tuberculosis can cause in the CNS, how it crosses the blood-brain barrier reaching the brain parenchyma and causing the abscess.
Suggest determining factors for diagnostic suspicion and the complementary studies necessary for its confirmation and possible treatments in different instances .
To present an operated case of an abscess located in the left cerebellar hemisphere caused by Mycobarterium Tuberculosis in an HIV - positive patient.

METHODOLOGY:

A bibliographic search was carried out in the publications of the Journal Neurosurgery , PubMed , SciELO and ScienceDirect using the keywords Mycobacterium , tuberculosis, abscess. Taking into account the possible injuries caused by Mycobacteria in the CNS, determining factors to make the diagnosis, necessary complementary studies and indicated treatments.
Data from the clinical history were obtained for the presentation of the operated case.

NEUROSURGICAL CASE:

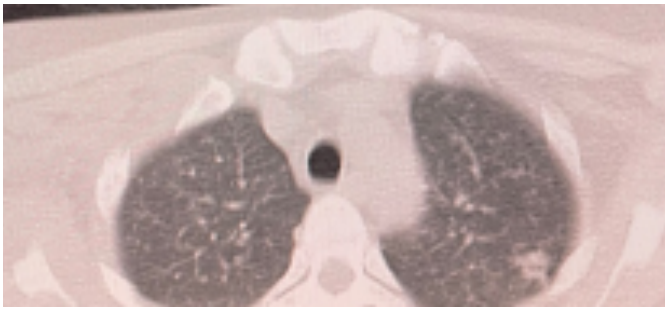
Female patient, 46 years old, chronic alcoholic , consumes drugs of abuse.
She was diagnosed HIV positive in 2015 , where she begins antiretroviral treatment. In 2019 , he abandoned antiretroviral treatment.
Consultation in the guard for pain in the right armpit

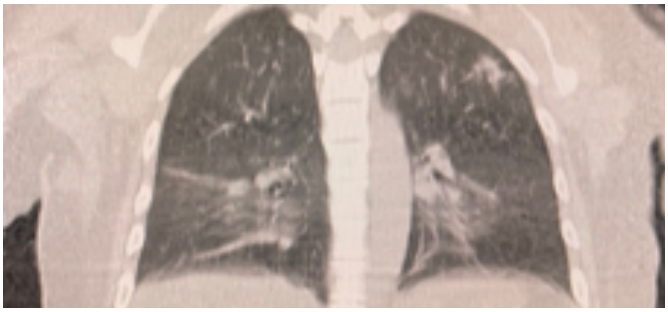
where a lesion highly suspicious of being a boil is evident. Antibiotic therapy and follow-up by outpatient clinics are indicated .

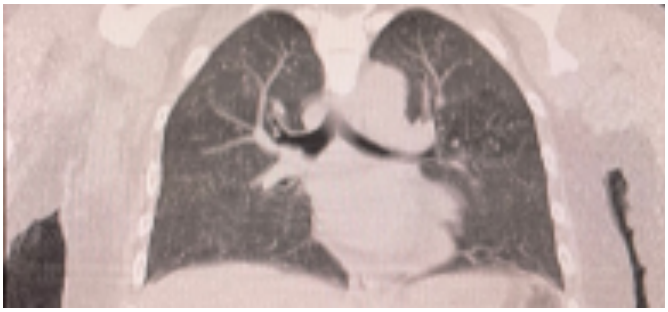
Due to the intensification of the pain, the patient consults again, where there is evidence of progression of the axillary lesion with spontaneous secretion. Samples are taken for direct examination and the diagnosis of tuberculosis (Scrofula) is obtained.

He was hospitalized for laboratory and imaging studies, initially a chest CT, and treatment for TB with 4 drugs was started. It presents hepatotoxicity to rifampicin , therefore the regimen of isoniazid , ethambutol , streptomycin and levofloxacin is administered .

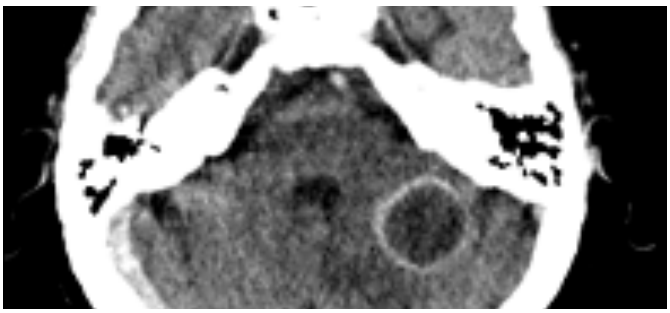
neurological examination , she was vigilant , oriented, mobilizes 4 limbs, with mild instability in gait. Brain CT is requested for eventual lumbar puncture and due to the visualization of a space-occupying lesion in the posterior fossa, it is contraindicated and a CT with and without contrast is urgently ordered to evaluate neurosurgical conduct .

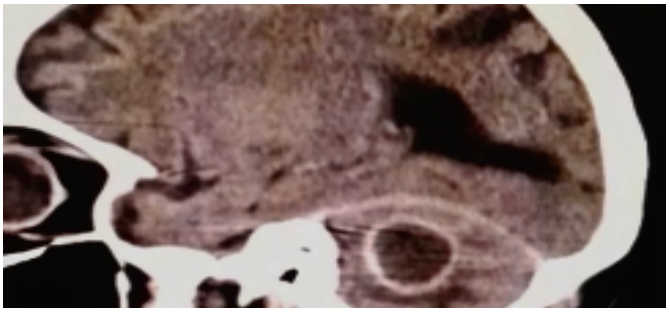






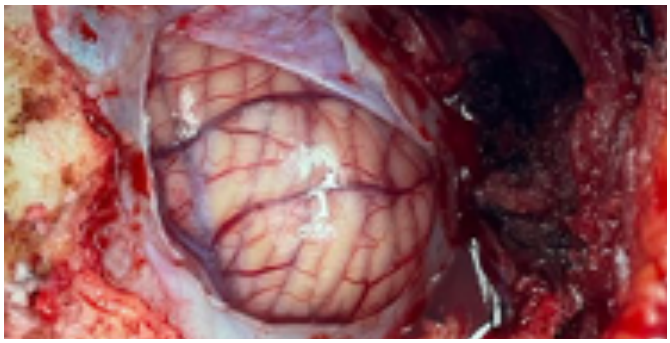
CHEST CT: Multiple nodular opacities with miliary pattern are visualized. Focus of consolidation of 11 mm in the posterior region of the left upper lobe.



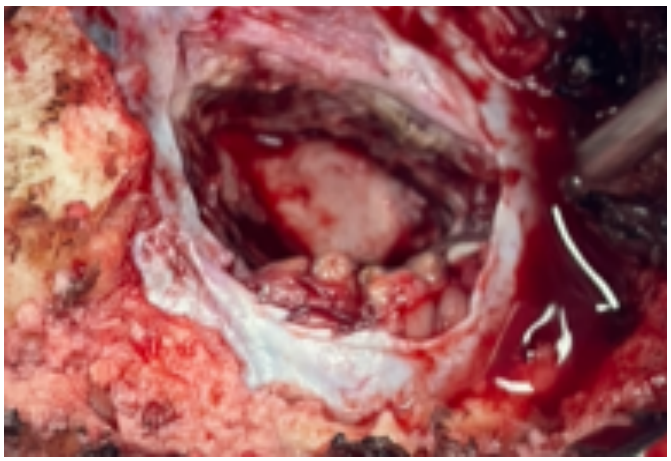


CT with contrast, axial, coronal and sagittal slices: There is evidence of a space-occupying lesion of more than 4 cm in diameter in the left cerebellar hemisphere that enhances with contrast in the form of a ring, internal hypodensity, with perilesional edema, with a mass effect that displaces and deforms the fourth ventricle.

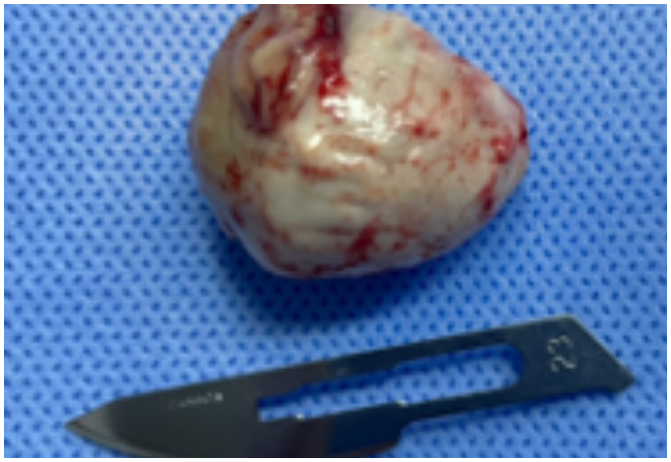
Surgery is indicated to perform exeresis of the posterior fossa abscess. The surgical approach is planned, opting for a retrosigmoid approach left parasagittal .



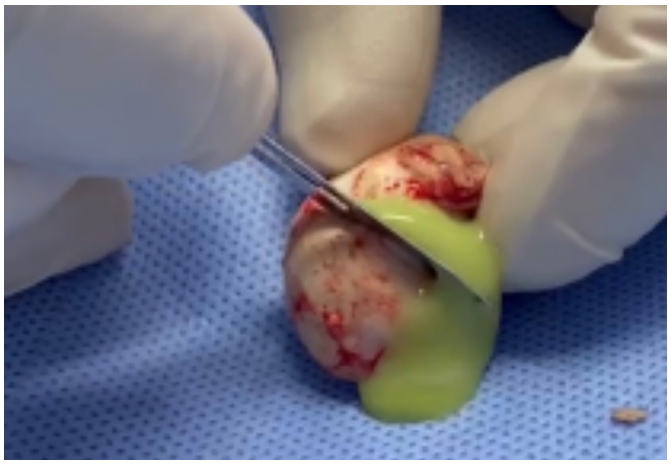
LEFT PARASAGITAL RETROSIGMOID APPROACH. Left suboccipital craniectomy was performed, opening of the dura mater, with transcalvarial herniation due to mass effect of the abscess and perilesional edema.



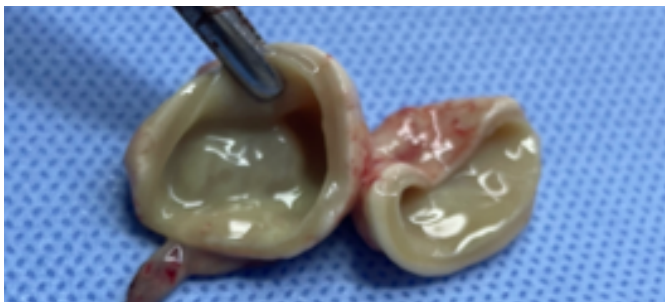
CEREBELLOUS ABSCESS EXPOSURE: Once the corticotomy is performed, the abscess is located and exposed, beginning the extracapsular dissection, respecting the swollen parenchyma.



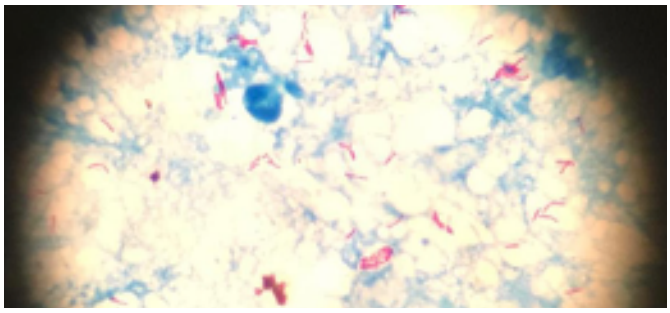
EXERESIS OF THE ABSCESS: The exeresis of the entire abscessed lesion is demonstrated.



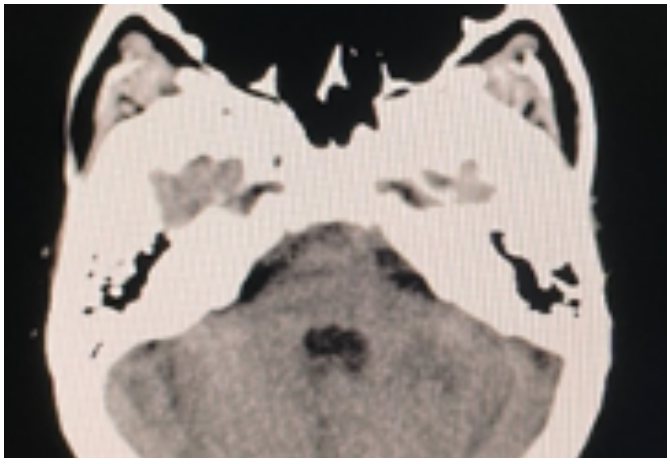
INCISION OF THE ABSCESS TO ASSESS ITS CONTENT: Material for pathological anatomy is sent, fundamentally the capsule and its contents for cultures, with the performance of direct diagnostic methods.



Once the abscess has been evacuated of its internal content and sectioned, the capsule of significant thickness is observed.



ZIEHL NEELSEN POSITIVE: With the direct method, the presence of ACID ALCOHOL RESISTANT BACILI (BAAR) is confirmed immediately after surgery.



BRAIN CT WITHOUT CONTRAST: Evidence of the surgical footprint, and confirms the removal of the lesion, without edema, with recovery of the midline and the usual architecture of the fourth ventricle.

The patient presented a good postoperative evolution, without neurological deficits , continuing her treatment for Tuberculosis. Under evaluation for the ideal start of antiretrovirals.

CONCLUSIONS:

Mycobacteium Tuberculosis affectation of the CNS is a serious pathology that must be diagnosed and treated quickly. To reach the CNS, the bacillus must cross the blood - brain barrier .

Meningoencephalitis is the most frequent presentation, followed by tuberculomas and, less frequently, brain abscesses. In patients with co-infection HIV and Tuberculosis the probability of presenting a brain abscess increases significantly (20%).

The deterioration and /or the neurological focus it is determined by the size , location and edema that as a whole increases the mass effect within a rigid structure such as the skull .

Due to the fact that a large number of bacilli are present inside the abscess, it is essential to carry out its exeresis, failing which, evacuation , both to decompress the CNS, and to extract the pathogen and confirm the diagnosis, carrying out the corresponding procedures. antibiograms . It should be noted that the lack of vascularization in the necrotic center prevents the antimicrobial from reaching it.

It must be considered that co-infection with multiple opportunistic pathogens is frequent in HIV-positive patients , therefore the clinical and imaging characteristics of an empirically established treatment must be strictly evaluated.

The Gold Stardard is the exeresis of the lesion , although in the presence of an unsafe access, an evacuation guided by puncture by stereotaxy or neuronavigation can be performed .

With respect to the clinical case presented, the patient, in addition to being HIV positive with treatment abandonment for 3 years , had other comorbidities such as chronic alcoholism. It was studied in its entirety , obtaining the diagnoses of the target organs, and the exeresis surgery of the cerebellar abscess was performed early. He presented a good postoperative evolution, without neurological sequelae and continued with the appropriate treatment for tuberculosis.

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