

## Cerebral Venous Thrombosis Due To Neurobrucellosis: A Case Report

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### Abstract

The involvement of the central peripheral nervous system (CNS) in brucellosis is rare. Cerebral venous thrombosis (CVT) is an exceptional complication. Only three cases were reported in literature.

We reported the case of 52 year old Tunisian women that had psychiatric disorders since 2 years without treatment. She had brucellosis diagnosis by positive standard agglutination test and she was treated by doxycycline. She was admitted with the history of fever, headache, vomiting neck stiffness and confusion. Neurological examination found disorientation and meningeal signs. Brain Magnetic resonance imaging revealed a right lateral transverse sinus thrombosis. Blood culture grew *Brucella melitensis* and the brucella antibody titre was positive. Cerebrospinal fluid (CSF) analysis revealed lymphocytic meningitis. She was treated by anticoagulant (LMWH) and association of 2 antibiotics (doxycycline and rifampicin). During follow-up, we remarked a significant and rapid clinical improvement.

**Keywords** Neurobrucellosis; Cerebral venous thrombosis; Lateral transverse sinus

### Introduction

Brucellosis is a rare multisystemic zoonotic infection caused by coccobacilli gram negative bacteria "brucella". It is specially observed in endemic countries particularly in rural areas. Myalgia, arthralgia, fever and asthenia are the main clinical manifestations [1]. Neurological complications are rare reported in 3-5% of cases and affected both central and peripheral nervous system [2,3]

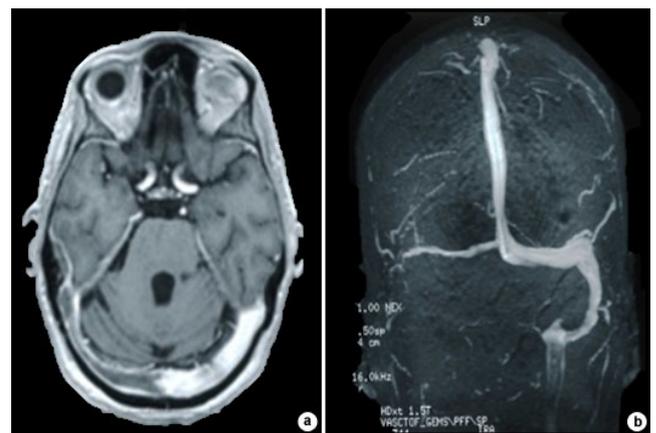
The most frequent neurological manifestations are meningitis and meningo-encephalitis [4]. The other major complications in neurobrucellosis are neuropsychiatric symptoms (agitation, depression, confusion...), sleep disorder, epilepsy, headache, intracranial hypertension, cranial nerve (CN) involvement, and polyradiculoneuritis [4-7]. However, thrombotic or hemorrhagic vascular complications are exceptional. Only few cases of cerebral venous thrombosis (CVT) due to neurobrucellosis were reported in literature [8-10].

### Case Report

A 52 year old woman is brought by her family for behavioral disorder. In fact, she was a farm hand and presented 2 years ago with the symptoms of mood fluctuation (episodes of agitation and depression), hallucination, memory loss and episode of confusion. She was not treated for these symptoms and did not take any medication. She has not been exposed to potentially toxic substances. She drinks raw goat's milk.

One month ago, she complained from headache, vomiting, attacks of fever and three day before admission to hospital she presented neck stiffness and attention deficit.

At physical examination, she was febrile (temperature: 39°C), meningeal signs were evident with neck stiffness and she was disoriented. Otolaryngological examination was normal; there was no sign of otitis, mastoiditis or buccal abscess. Pulmonary auscultation was unremarkable. Brain magnetic resonance imaging (MRI) confirmed right lateral transverse sinus thromboses as well as a thrombus in the right internal jugular vein without any change in brain parenchyma. There is no sign of subdural empyema or hydrocephalus (Figure 1).



**Figure 1:** T1 weighted brain MRI after gadolinium injection (a) and MR angiography (b) showing right lateral sinus thrombosis and enhancement of the meninges.

The laboratory work-up demonstrates leucopenia in blood cell count (3300/m<sup>3</sup>), ESR was accelerated (60 first hours) and C-reactive protein level was increased (117 mg/l) suggesting inflammatory

syndrome. Cerebrospinal tap demonstrated a marked increase in the cerebrospinal pressure with an opening pressure of 350 mm H<sub>2</sub>O. Cerebrospinal fluid (CSF) analysis revealed: 20 white blood cells/mm<sup>3</sup>, glucose 35 mg/dl, protein 1.05 g/l. PCR of CSF did not find viral genome including herpes Herpes Simplex Virus (HSV), Epstein-Barr virus (EBV), cytomegalovirus (CMV) and herpes (HSV). Immunological tests such as antinuclear, anticardiolipin and antiphospholipid antibodies were normal. Levels of C protein, S protein and antithrombin III were within normal range. There was no resistance to activated C protein.

Wright agglutination test for brucellosis in serum was positive at a very high titer (1/1280). Blood culture during a fever attack disclosed *Brucella*.

Based on these results, diagnosis of brucellosis was confirmed. The patient was started on an oral combination of 3 antibiotics; rifampin, doxycycline and Sulfamethoxazole/trimethoprim; and anticoagulation. During follow-up, we remarked a significant and rapid clinical improvement. Fever, headache and meningeal signs disappeared within few days; however psychiatric disorders dissipate more slowly. Treatment combining anticoagulant and 2 antibiotics was extended for 6 months.

## Discussion

Brucellosis remains a major public health problem in many countries such as in Tunisia. This bacterium can involve both central and peripheral nervous system. Neurological complications are rare but polymorph making the diagnosis difficult particularly when the infection is unknown. Diagnosis of neurobrucellosis required compatible clinical history with CSF showing pleocytosis (>20/mm<sup>3</sup>), elevated protein content (>45 mg/dL), low CSF/plasma glucose rate (<0.50); and isolation of brucella from blood or CSF, or serology of brucellosis positive in CSF [11]. Our patient had evident clinical meningeal syndrome with a clinical history of brucellosis, isolation of brucella from blood associated with lymphocytic meningitis in the CSF.

Psychiatric disorders such as cognitive impairment, depression, amnesia, psychosis agitation, nightmares, personality disorders, are fairly common complications of neurobrucellosis with or without neurological involvement and could be indicative of the disease especially when it appears at a late age [5].

Vascular complications of brucellosis are rare and it affected preferentially arteries than veins [12,13]. Certain vascular complications have been reported in Tunisia such as deep vein thrombosis (DVT), however, cerebral venous thrombosis (CVT) has not been yet described in this endemic countries [12]. CVT as a manifestation of neurobrucellosis is extremely rare. In 1999, Zaidan et al. [8] reported the first case of brucellosis complicated with cerebral venous thrombosis in Arabia Saudi. In 2013, Faraji et al. described uncontrolled seizures resulting from CVT complicating neurobrucellosis [9].

Septic lateral sinus thrombosis is usually caused by local or regional infections (otitis, mastoiditis...). Many bacteria were described such as *Staphylococcus*, *Enterobacteriaceae*, *Proteus*, *Pseudomonas* and others species. *Brucella melitensis* has not been reported in septic lateral sinus thrombosis [14]. Three mechanisms may explain the vein thrombosis: compressive, inflammatory process or hypercoagulable state secondary to the release of toxin or antigen by brucella [12]. In our case, levels of

physiological coagulation inhibitors were normal and there was no compressive factor at MRI. CVT seems to be related to the inflammation of the dura constituting the wall of the lateral sinus.

There is no clear guideline for the treatment of brucellosis; however all the authors agree that combination of 2 or 3 antibiotics is mandatory. Some authors recommend the following antibiotics: doxycycline, rifampicin, trimethoprim-sulfamethoxazole, streptomycin, and/or ceftriaxone for a period of 4 to 9 months [4]. Usefulness of anticoagulation therapy remains controversial, some authors think that it prevents the extension of thrombosis and recommend its use in all cases of CVT regardless to its origin septic or aseptic [14].

## Conclusion

Neurological complications of brucellosis are rare but polymorph and nonspecific, they could be severe and life threatening. Psychiatric symptoms and CVT are rarely observed. It is important to think about brucellosis in endemic areas. Blood tests should be performed rapidly. Early diagnosis and specific treatment are the unique guarantee to have good prognosis and better outcomes.

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