CEREBRAL VENOUS THROMBOSIS DURING TUBERCULOUS MENINGOENCEPHALITIS: A RARE CASE IN THE ICU

Abstract

Cerebral venous thrombosis is an uncommon neurovascular complication, marked by significant clinical and etiological heterogeneity. Infectious causes account for fewer than 10% of cases, with tuberculous involvement of the central nervous system representing an exceptional etiology.

We report the case of a 25-year-old patient presenting with febrile impaired consciousness and anisocoria, in whom the medical history revealed close contact with a confirmed case of tuberculosis. Initial laboratory investigations and cerebrospinal fluid analysis were highly suggestive of tuberculous infection of the central nervous system, despite the absence of Mycobacterium tuberculosis isolation from CSF. Cerebral MR angiography demonstrated findings consistent with tuberculous meningoencephalitis complicated by cerebral venous thrombosis.

Management included initial stabilization, endotracheal intubation followed by tracheostomy, anti-tuberculosis therapy, and full-dose anticoagulation. Clinical evolution was favorable, with progressive neurological recovery.

This case highlights the rarity and diagnostic complexity of the coexistence of tuberculous meningoencephalitis and cerebral venous thrombosis, and underscores the need for prompt, comprehensive management combining anti-tuberculosis treatment, corticosteroid therapy, and anticoagulation.

Keywords : tuberculosis, altered consciousness, cerebral venous thrombosis, anticoagulation

Introduction

Tuberculosis remains a major public health issue in Morocco, with approximately 30,000 new cases reported annually across all forms, of which tuberculous meningitis (TBM) accounts for about 0.8%(1) .Despite its low prevalence, TBM remains one of the most severe forms of the disease, characterized by a frequently delayed diagnosis and high morbidity and mortality(2).

Cerebral venous thrombosis (CVT) is a rare vascular complication of the central nervous system, with an incidence estimated at 1.5 cases per 100,000 population. It may be favored by infectious, inflammatory, or immunological disorders(3). The association between TBM and CVT is exceptional and only rarely described in the literature. This coexistence presents a major diagnostic challenge due to the nonspecific nature of clinical manifestations, as well as therapeutic and prognostic complexities.

We report the case of a young patient with tuberculous meningoencephalitis complicated by cerebral venous thrombosis, illustrating the diagnostic and therapeutic challenges and underscoring the importance of appropriate management in a tuberculosis-endemic setting.

Observation :

A 25-year-old patient, an active smoker (18 pack-years) and cannabis user, with a history of tuberculosis exposure (mother treated for pulmonary and gastrointestinal tuberculosis), was admitted to the intensive care unit for febrile altered consciousness associated with anisocoria. The medical history revealed, over the preceding three weeks, signs suggestive of tuberculosis, including fever, night sweats, and unquantified weight loss, followed by headaches, vomiting, and progressive deterioration of consciousness.

On admission, the patient had a Glasgow Coma Scale (GCS) score of 6, necessitating orotracheal intubation and initial stabilization. Non-contrast brain CT demonstrated active quadriventricular hydrocephalus with several hypodense areas associated with cerebral edema.

A lumbar puncture was performed, revealing:

- CSF protein: 7.62 g/L
- CSF glucose: 0.29 g/L (with concomitant blood glucose of 1.34 g/L)
- White blood cells: 8 cells/mm³
- Red bloodcells: 9,600/mm³”
- Direct examination:negative
- GeneXpert PCR for Mycobacterium tuberculosis: negative.

Despite the absence of bacillus identification, the combination of clinical, radiological, and laboratory findings pointed towards tuberculous meningitis. Standard anti-tuberculosis therapy, combined with corticosteroid treatment, was initiated.

Further evaluation with cerebral MR angiography revealed abnormalities consistent with tuberculous meningoencephalitis complicated by cerebral venous thrombosis. Curative anticoagulation was subsequently started.

The clinical course was favorable, marked by:

- the performance of a tracheostomy on day 10.
- Neurologicalimprovement (GCS 9)
- Resolution of the febrile syndrome
- Improvement of hemodynamic parameters and transcranial Doppler finding

- Follow-up CT scan showed stable hydrocephalus without any new visible complications

Discussion

The coexistence of tuberculous meningitis (TBM) and cerebral venous thrombosis (CVT) is uncommon and remains only sparsely documented in the literature. This association poses diagnostic challenges, as both conditions may present with overlapping symptoms such as headache, vomiting, altered consciousness, and signs of intracranial hypertension. In regions where tuberculosis is endemic, maintaining a high index of suspicion is crucial to prevent diagnostic delays that could lead to serious clinical consequences.

In a recent series by Li et al. involving 28 patients with tuberculous meningitis complicated by cerebral venous thrombosis, the mortality rate reached 17.9%. Among the survivors, most achieved a satisfactory functional recovery following the initiation of antituberculous therapy combined with anticoagulation (4). Several isolated case reports have also described this association, emphasizing its rarity but also its potential severity (Table 1).

From a pathophysiological standpoint, multiple mechanisms have been proposed to explain the development of cerebral venous thrombosis in the context of tuberculous meningitis. These include direct endothelial injury caused by granulomatous inflammation, a prothrombotic state driven by the systemic inflammatory response, and platelet activation that has been documented in severe forms of tuberculosis (5,6). These mechanisms collectively contribute to an increased risk of thrombus formation within the cerebral venous sinuses

he diagnosis may be challenging due to the non-specific nature of clinical signs and the overlap between the manifestations of cerebral venous thrombosis and those of tuberculous meningitis itself. Magnetic resonance venography remains the reference imaging modality, as it can detect CVT even when clinical findings or initial CT imaging do not suggest the diagnosis(7). In our case, tuberculous meningitis was strongly suspected based on clinical, biological, and radiological findings, despite the absence of Mycobacterium tuberculosis isolation in the cerebrospinal fluid—an occurrence that is common in this condition.

Management is based on a three- or four-drug antituberculous regimen combined with corticosteroid therapy, which helps reduce meningeal inflammation and the risk of neurological complications. Anticoagulation is recommended in cases of cerebral venous thrombosis, unless contraindicated, to prevent thrombus extension and improve overall prognosis. In our case, the early initiation of these treatments led to a favorable clinical outcome.

This case highlights the importance of early diagnosis and a multidisciplinary approach when managing this rare association, particularly in regions with a high prevalence of tuberculosis.

Tableau 1 review of the literature for cerebral venous thrombosis during tuberculosis

article	Number of cases	evolution
Aseptic cerebral venous thrombosis and cerebral tuberculomas complicating miliary tuberculosis.(8)	1 case	Good evolution
Tuberculosis, an uncommon cause of cerebral venous thrombosis(9)	1 case	Good evolution
Septic cavernous sinus thrombosis caused by tuberculosis infection(10)	1 case	Oculomotorparesis
Superior sagittal sinus thrombosis caused by calvarial tuberculosis (11)	1	Good evolution

Conclusion

the occurrence of cerebral venous thrombosis during tuberculous meningoencephalitis represents a rare but serious complication, often challenging to recognize due to overlapping clinical manifestations. This case emphasizes the need for heightened vigilance in regions with high tuberculosis prevalence and the early use of vascular imaging when atypical neurological progression is observed. Prompt management combining antituberculous therapy, corticosteroids, and anticoagulation can improve prognosis and minimize neurological sequelae.

Figure 1Non-contrast brain CT scan demonstrating quadriventricular hydrocephalus with hypodense regions

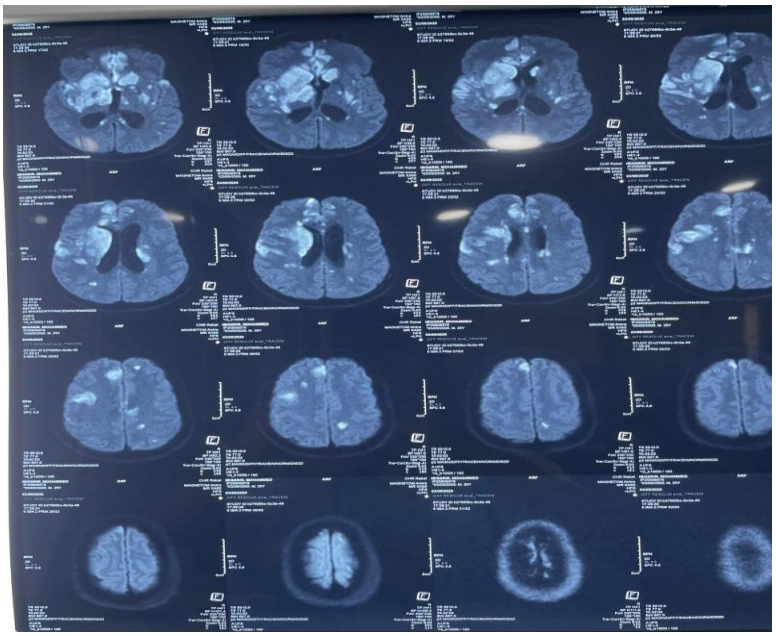

Figure 2Cerebral MR angiography demonstrating septic involvement of the telencephalon associated with cerebral venous thrombosis

Informed consent :

Written informed consent was obtained from the patients and their legal guardiansfor publication of this case report and the accompanying images. A copy of the consent is available for review by the Editor-in-Chief of this journal

Figure and table

Table 2 review of the literature for cerebral venous thrombosis during tuberculosis

Figure 1 Non-contrastbrain CT scan demonstratingquadriventricularhydrocephaluswith hypodense regions

Figure 2Cerebral MR angiography demonstrating septic involvement of the telencephalon associated with cerebral venous thrombosis

Conflict of interest:

The authors declare that they have no conflict of interest.

author contributions:

All authors contributed to the realization of this work

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