



CASE STUDY

TUBERCULOSIS RELATED ISCHEMIC STROKE: A CASE REPORT

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ABSTRACT

Tuberculosis (TB) is a widespread infectious disease caused by Mycobacterium Tubercle Bacilli. In 15-20 % of cases of active pulmonary TB, the infection spreads to extrapulmonary foci, including nervous system complications. Ischemic stroke-related tuberculosis without meningitis is rare. We report a 74-year-old female presented with rapid onset confusion, unconsciousness, and left hemiparesis. She had been recently diagnosed with active TB 3 months ago and treated with a combination anti-tuberculosis regimen. Her recent acute neurological manifestations began within 24 hours prior to admission to the hospital. The brain CT showed middle cerebral artery territory infarction. The risk factors tracing found no significant abnormality. The only abnormal finding was high CRP. This report describes a rare case of a patient with active TB who presented with acute ischemic stroke.

Keywords: Active TB; Ischemic stroke; Vasculitis

АБСТРАКТ

Туберкулез (ТБ) - широко распространенное инфекционное заболевание, вызываемое микобактериями туберкулезной палочки. В 15-20 % случаев активного легочного ТБ инфекция распространяется на внелегочные очаги, включая осложнения со стороны нервной системы. Туберкулез, связанный с ишемическим инсультом, без менингита встречается редко. Мы сообщаем о 74-летней женщине, у которой быстро развились спутанность сознания, потеря сознания и левый гемипарез. 3 месяца назад у нее был диагностирован активный туберкулез, и она получала комбинированную противотуберкулезную терапию. Последние острые неврологические проявления начались в течение 24 часов до поступления в больницу. КТ головного мозга показала инфаркт территории средней мозговой артерии. Обследование факторов риска не выявило значительных отклонений. Единственной аномальной находкой был высокий уровень CRP. В данном отчете описан редкий случай пациента с активной формой туберкулеза, у которого развился острый ишемический инсульт.

Ключевые слова: Активный туберкулез; ишемический инсульт; васкулит

INTRODUCTION

The common manifestation of central nervous system TB are meningitis, tuberculomas, and encephalopathy. Some uncommon manifestations include pachymeningitis, focal ischemia, and vasculitis.¹ Focal neurological signs that are caused by vasculitis with inflammation and thrombosis may be seen in minor cases.²

Previous studies showed that patients with pulmonary TB usually have thrombocytosis and hyperaggregation. This abnormality may be related to high levels of CRP.³ The combination of inflammation (vasculitis) and hemostatic changes may result in a hypercoagulable state and thrombotic event.⁴ Ischemic stroke is a rare complication in patients with primary tuberculosis.^{4,5} We report a case of a patient presented with left-sided hemiparesis without any significant traditional vascular risk factors, no previous history of stroke, and DVT. After careful investigation and ruling out any other common causes for stroke, TB could be a factor leading to thrombus formation via the vasculitis pathway.

CASE DESCRIPTION

We report a 74-year-old female that was brought to the emergency department with new onset disorientation, confusion, unconsciousness, and left hemiparesis. She was diagnosed three months earlier with lung tuberculosis and on anti-tuberculosis treatment. Before her prior hospital stay, a comprehensive diagnostic work-up established a diagnosis of tuberculosis.

The Glasgow Coma Scale on hospital admission was 9. The pupil was isochor, with left-side lateralization and positive pathological reflex on the left side. The blood pressure, respiratory rate, temperature, and pulse were normal. No nuchal rigidity and meningeal sign were found. The chest radiograph showed an active TB pattern (**Figure 1**). Three separate sputum smear examinations did not reveal Acid Fast Bacilli. The patient was immune-competent with no

obvious risk factors for immunosuppression. Past medical history did not reveal a history of high blood pressure, diabetes mellitus, cardiac problems, smoking, or HIV infection. The ECG and cardiology consultations were unremarkable. The laboratory examination was normal for blood routine, blood glucose, cholesterol, LDL, electrolyte, hepatic function, and renal function. The only abnormal result was high CRP (C Reactive Protein) (30,94 mg/L, normal value: < 5 mg/L).

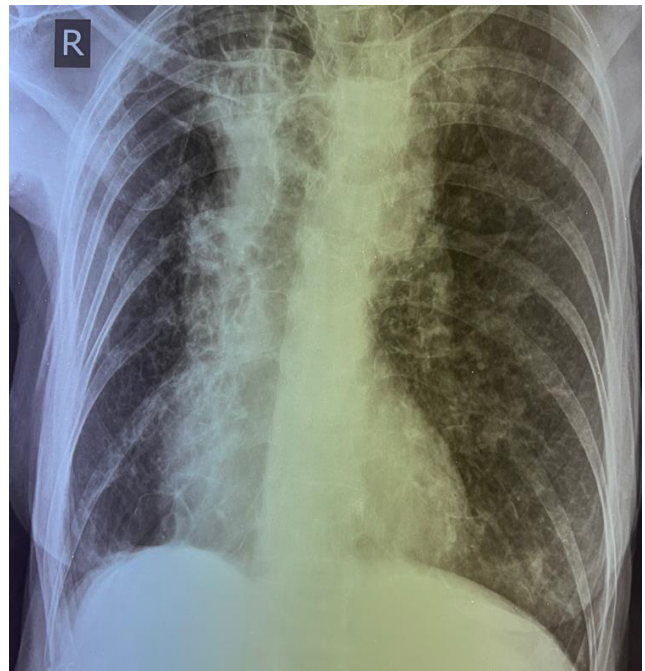


Figure 1. The chest x ray showed active TB

The brain CT Scan showed large hypodensity area in the territory of middle cerebral artery (**Figure 2**). This patient was treated with dual anti platelet medication (clopidogrel and aspirin), high intensity statin (atorvastatin 40 mg), steroid (methylprednisolone), mannitol, and anti-TB therapy (ATT), with levofloxacin infusion. Her condition slowly improved and the patient was fully conscious in the third day. The dual anti platelet therapy and physical therapy was continued. On the fifth day the condition suddenly worsened, with impending respiratory failure. Acute respiratory distress complication resulted the patient deceasing in five days.

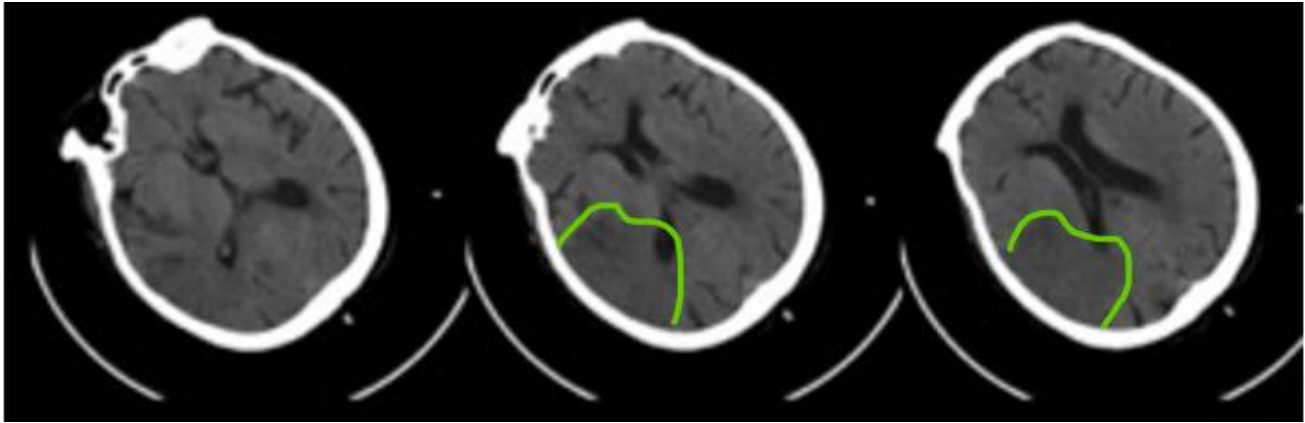


Figure 2. The brain CT showed a large middle cerebral artery territory infarction

DISCUSSION

We report a case of TB related ischemic stroke without meningitis. An extensive review of literature review shows that only a few cases have been reported where an adult patient with active and miliary TB presented with acute ischemic middle cerebral artery stroke, and the patient passed away from the disease complications.^{6,7}

The unusual presentation and undetectable risk factor of ischemic stroke, in this case, highlights the importance of considering primary pulmonary TB infections and vasculitis connection. The diagnosis of the present case was confirmed by different analyses, including chest X-ray and GeneXpert MTB/RIF analysis.⁸ The vasculitis-related event was shown by very high C reactive protein (CRP).⁹ A previous study also reports cerebral stroke as an initial manifestation of the spread of tuberculosis infection.⁶ Previous studies also found that cerebral infarction is closely related to tuberculosis meningitis.⁹

The role of acute and chronic infections in stroke is well established. Infection can lead to inflammation, leading to fatty plaques in blood vessels, atherogenic reactions, and changes in host metabolism.^{8,9} Some studies have suggested a chronic inflammatory state that increases the risk of various systemic diseases, including cardiovascular disease, in patients with tuberculosis even after adequate antimicrobial treatment. Patients with tuberculosis were found to have an increased incidence of ischemic stroke.^{10,11,12}

The actual mechanisms contributing to the association between tuberculosis and stroke are not fully understood. Infections by *Mycobacterium tuberculosis* lead to the activation of a persistent inflammatory response that starts a cascade of cytokines and chemokines.⁹ The inflammatory response was established to be of pathogenic relevance in the link between infection and atherosclerosis, and it may relate to endothelial dysfunction.^{10,11} Increased C-reactive protein, a marker of systemic inflammation accompanying active tuberculosis, may also be associated with atherosclerosis and could lead to cardiovascular events.^{4,5,10} Another mechanism that links infection with atherosclerosis may be the induction of autoimmunity through antibodies.^{10,12}

CONCLUSION

We report a rare case of ischemic stroke related to tuberculosis without meningitis. The unusual presentation and undetectable risk factor of ischemic stroke, in this case, highlights the importance of considering primary pulmonary TB infections and vasculitis connection.

ACKNOWLEDGMENT

No identity of patients was revealed. Verbal informed consent has been obtained.

DECLARATIONS

The Authors has no conflict of interest

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