

# Occipital Brain abscess with Manifestations of Stroke in a Patient with Chronic Lymphoblastic Leukemia

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## Abstract

Cerebral abscess in patients without a history of previous neurological disease rarely occurs with focal neurological symptoms similar to stroke. The aim of this study was to introduce a disease that has no history of ischemic brain disease but is referred to with focal neurological manifestations and finally treated with a diagnosis of brain abscess.

A 71-year-old man known case of CLL & Ischemic heart disease was admitted due to acute visual field disorder, headache specially in the left temporal region, fever and anorexia in the last past month. A brain lesion measuring 20×35 mm was seen with irregular ring enhancement and vasogenic edema and diffusion restriction at the center of the lesion suspected of having a brain abscess. Experimental treatment with cefipime, vancomycin and metronidazole as well as intravenous dexamethasone was started and chlorambucil was discontinued. During surgery, the mass was observed with necrosis and pus, and pus was drained and sent for smear and culture. Also, the tumor wall was sent for histological evaluation. The patient was discharged from hospital three weeks after surgery with good general condition and oral proper antibiotics without any neurological defect.

The importance of introducing this patient is to pay attention to the IRI findings in immunocompromised patients to be considered in the differential diagnosis of focal neurological disorder of brain abscess.

**Keywords:** brain abscess; focal neurologic symptom; visual field

## Introduction

Cerebral abscess disease has been reported in people with a history of trauma or cerebral ischemia. The predominant symptoms of a brain abscess include fever, headache, and dizziness, but atypical symptoms such as loss of consciousness and focal brain symptoms can be seen in the disease and misdiagnosed as stroke [1,2].

Brain abscess has been reported in patients at the site of previous stroke, while brain abscess with focal neurological symptoms has been very rare in a person without a history of stroke [3,4]

The present study introduces a disease that has no history of ischemic brain disease but is referred to with focal neurological symptoms and due to a history of ischemic heart disease was first examined with suspicion of stroke.

## Case presentation:

A 71-year-old man was admitted to emergency ward for an initial diagnosis of stroke due to acute visual field disorder from one week before admission. In addition, the patient had history of mild headache specially in the left temporal region, fever and anorexia in the last past month.

The patient had a history of hypertension and ischemic heart disease for the last 15 years. He also had chronic leukemia from 11 years ago which has been recommended for treatment with chlorambucil for recent last year due to recurrence of symptoms.

In initial physical examination, Fever (central temperature of 38 ° C) and tachy cardia were detected. Glasco coma scale, pupil reflex, fundoscopy and other neurologic examinations were all normal. Upper and lower extremities were good and symmetrical. Hemianopia was reported in visual field exam.

In Lab data, white blood cell counts of 8.2mg / dL, hemoglobin 10.4 mg / dL, erythrocyte sedimentation rate (ESR) was 15 mm / h, and CRP was 5 mg / L were detected.

A heterogeneous lesion in the area of the left occipital and parietal lobe with peripheral edema and a compressive effect on the posterior horn of left lateral ventricular was seen in Brain Computed tomography (CT scan) (fig.1-A)

Due to a brain lesion outside the blood flow range of posterior occipital artery (PCA) with suspicion of abscess or brain mass, magnetic resonance imaging (MRI) of the brain was performed with and without contrast. A brain lesion measuring 20×35 mm was seen with irregular ring enhancement and vasogenic edema and diffusion restriction at the center of the lesion suspected of having a brain abscess. (fig.1 B-F)

Experimental treatment with cefipime, vancomycin and metronidazole as well as intravenous dexamethasone was started and chlorambucil was discontinued. After cardiopulmonary examinations, the patient was prepared for surgery and biopsy of the lesion. (GCSF) was injected subcutaneously before surgery.

During surgery, the mass was observed with necrosis and pus, and pus was drained and sent for smear and culture. Also, the tumor wall was sent for histological evaluation.

On microscopic examination of the submitted sample, purulent foci including fibrin glands, acute inflammatory cell infiltration and cellular debris were seen along with sections of brain tissue were seen. Around it granulosa tissue (fresh blood vessels) and then the gliotic reaction was evident. (fig.2 A-B)

The patient was discharged from hospital three weeks after surgery with good general condition and oral proper antibiotics without any neurological defect.

fig.1 A: CT scan of the head before surgery showed an absorbent lesion and heterogeneity with the effect of compression and surrounding edema B-D: A space-occupying lesion with signal shadows weighing T1 and weighing T2 is found in the left occipital lobe and is surrounded by large patches of swelling.

D-E Enhanced T1-weight showed an irregular ring lesion measuring 35×20 mm<sup>2</sup> in the left occipital lobe with vasogenic swelling around it. The lesion shows a central diffusion limit.

## Discussion:

Brain abscess is a focal infection in the brain parenchyma that is mostly caused by pulmonary or cardiovascular infections but studies have indicated that attic infections, sinusitis, dental infections or any other infection sites in the body could attribute to brain abscess. Studies have also claimed that almost 10% of brain abscess occur in cases with disrupted brain barriers mostly due to neurological interventions and trauma [1].

Most importantly, clinical manifestations of brain abscess are almost specific to central nervous system (CNS) masses [2]. These manifestations include nausea, vomiting, seizure and headache. The clinical presentations of brain abscess could also be non-specific at the beginning of the disease. Fever, headache and focal neurologic deficits are most common presentations of brain abscess but are of course not specific and reliable [3].

Stroke could be divided into hemorrhagic and ischemic patterns that are mostly the results of Arterial Ischemic Stroke (AIS), venous infarction, or

Cerebral Sinovenous Thrombosis (CSVT). The most common manifestations of stroke are hemiparesis and hemi facial, speech or visual disturbance, ataxia, headache and also seizure [4]. It has been reported that the mechanisms of stroke-like presentations of brain abscess are unknown but researchers have suggested paroxysmal septic emboli as a common cause of abscess formation within or near areas of embolic infarction [5].

In the present study, we reported a 71-year-old man with initial diagnosis of stroke due to the clinical manifestations. The presented case was declared a significant reduction in his right visual field, mild headache and previous history of CLL. The findings of Brain MRI were suggestive of brain abscess.

Previously, rare cases of brain abscess with manifestations of stroke have been reported. Shintani et al. presented a healthy 40-year-old man that was admitted due to sudden 'stroke-like' symptoms that was later diagnosed with cerebral abscess. The main manifestation of their case included decreased visual acuity [6]. In 2019, Tsifi et al. reported a 62-year-old female who suddenly developed right hemiparesis mimicking a stroke. Brain imaging studies showed a brain abscess in the right hemisphere [7]. In the current report, we also presented a rare case of brain abscess mimicking a stroke in a patients with past medical history of ischemic heart disease, hypertension and CLL.

Recently, Prayon et al. reported a 12-year old boy with sudden onset of right-sided weakness. The patient also reported low grade intermittent fever almost 4 days prior to his admission. Bain imaging showed focal brain atrophy at the right frontal lobe area without any sign of hemorrhage or infarction that was later diagnosed with interval enlargement of the rim-enhancing fluid density in the left frontal lobe almost 37 days after his admission (8). Some other cases have been reported about abscess development on the site of previous strokes [9]. Kaplan et al. reported three cases of brain abscess at the same location of previous stroke [10]. Furthermore, Boukobza presented a rare case of brain abscess complicating venous ischemic stroke and suggested that the associations of brain abscess and stroke should be well studied [11]. In our case, the patient did not have any history of previous stroke and What misled us at the beginning of the study was the history of ischemic heart disease and visual impairment as a focal neurological symptom.

These data indicate the importance of brain abscess manifested as stroke and also secondary to stroke. Regardless of the mechanisms of these pathologies, we believe that neurologists should consider other brain masses such as brain abscess as possible causes of stroke symptoms. The present study emphasizes the emergent use of proper imaging tools in patients suspicious to stroke. Early diagnosis and treatments of brain abscess could therefore, reduce the morbidity and mortality rates of patients.

A key point in this patient is that the cause of cerebral abscess in this patient without a history of previous cerebrovascular accidents is CLL disease and receiving chlorambucil and the resulting immunodeficiency.

## Conclusion:

In conclusion, it can be pointed out that in patients with nonspecific abscess symptoms such as focal neurological symptoms, careful attention to MRI findings can be beneficial. The history of CLL disease and immunodeficiency should be mentioned as the risk factors of brain abscess in a patient without any previous history of cerebral ischemic event.

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