

# Cerebral venous sinus thrombosis presenting to the emergency department with recurrent epileptiform seizure; Case Report

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## Abstract

Cerebral venous sinus thrombosis (CVST) is a rare and potentially fatal condition. A 23-year-old man was admitted to the emergency department of Maresal Cakmak Military Hospital, Erzurum two times in one week for epileptiform seizures. As noncontrast head computed tomography (CT) scan was normal, he was first diagnosed with epilepsy. Magnetic resonance imaging (MRI) and magnetic resonance venography (MRV) showed the thrombus in the right transverse sinus, right straight sinus, and superior sagittal sinus. CVST should be considered for the differential diagnosis of patients who were admitted to the emergency department with epilepsy or epileptiform seizures and both MRI and MRV should be used for the diagnosis.

## INTRODUCTION

Cerebral venous sinus thrombosis (CVST) is a rare and potentially fatal condition (1). CVST presents with a wide spectrum of symptoms including headache, nausea, vomiting, papilla edema, focal neurological deficits, diplopia, seizures and even coma. CVST can have a highly variable presentation depending on the etiology. The presentation can be acute, subacute, or chronic state (2, 3). The most frequently affected locations are the superior sagittal sinus, transverse and sigmoid sinus, sinus cavernosus, and sinus rectus. In about one-third of cases the main cerebral venous sinuses affected by CVST are the superior sagittal sinus (4). It is easy to diagnose CVST when it is remembered but there is still delay in the diagnosis and treatment as CVST presents with a wide spectrum of symptoms. Although head computed tomography (CT) is performed if the patient presents epileptiform seizures, it is not a valuable method in the diagnosis of CVST. Magnetic resonance imaging (MRI) and magnetic resonance venography (MRV) should be used together to establish definitive diagnosis (5).

In this study, we aimed to present a case which was admitted to the emergency department with recurrent seizures and was diagnosed as CVST with MRI.

## CASE REPORT

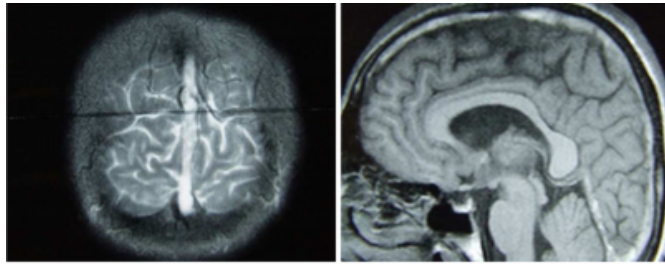
A 23-year-old man was admitted to the emergency

department of Maresal Cakmak Military Hospital, Erzurum two times in one week for seizures. It was reported that seizure episode occurred 15 minutes, the patient was unconscious during the episode and he had fatigue. It was reported that last time he was admitted to the hospital with similar symptoms. Urine tract infection and acute tonsillopharyngitis was diagnosed. On admission all vital signs were within normal limits. Pupils were equal and reactive and there was no papillary edema. The plantar reflex was bilaterally extensor and there was no more pathological finding.

The complete blood count, coagulation tests, and basic metabolic profile were performed and all values were within normal limits. A non-contrast CT showed no pathological findings. As the electroencephalography (EEG) showed generalized paroxysmal theta and delta activity, the patient was hospitalized with the diagnosis of epilepsy in the neurology clinic. MRI was performed on the same day. Axial TSE T2A and sagittal TSE T1A images demonstrated signal intensity in the right transverse sinus, right straight sinus, and superior sagittal sinus. It was correlated with sinus venous thrombosis (Fig.1).

**Figure 1**

Figure 1 (a, b). Axial TSE T2A and sagittal TSE T1A images demonstrated high signal intensity in superior and inferior sagittal sinus associated with CVST.



The patient with CVST was treated with unfractionated heparin (Fraxiparin®) and phenytoin sodium (Epanutin®). He was transferred to the department of neurology of Gulhane Military Medical Academy (GMMA), Ankara for further diagnosis and treatment. A brain MRV was performed in GMMA. It showed an area of restricted diffusion in the periventricular white matter compatible with acute infarction and a thrombosis of the superior sagittal sinus, right transverse sinus, and sinus rectus. A combination of warfarin (Coumadin®), sodium valproate/valproic acid (Depakine Chrono®), and acetazolamide (Diazoxide®) treatment was begun and he was discharged.

**DISCUSSION**

As cerebral venous sinus thrombosis presents with a wide spectrum of symptoms, it is hard to diagnose. Ferro et al reported that early seizure occurred in 40% of patients with CVST and 7% of them had a higher risk of recurrent seizures within 2 weeks (6). Our patient was admitted to the hospital with epileptiform seizure and he was discharged with a diagnosis of acute tonsillopharyngitis. Later he was admitted to the emergency department of our hospital with the same symptoms. An EEG was performed and it showed generalized paroxysmal theta and delta activity. Then the patient was hospitalized with the diagnosis of epilepsy in the neurology clinic. The etiology of CVST includes mastoiditis, sinusitis, otitis media, trauma, oral contraceptives, pregnancy, postpartum state, dehydration, malignancies, polychytemia, sickle cell anemia, and hematologic disorders including protein-C and protein-S deficiencies. It is seen idiopathically in 25-30% of cases (2, 7). As our patient had a medical history remarkable for acute tonsillopharyngitis, it was concluded that infectious disease was the predisposing factor.

Although computerized tomography could be helpful in the differential diagnosis of CVST, it is not useful for the diagnosis. CT scans were normal in 40% of cases (7, 8). In our case CT scan findings were normal.

MRI and MR venography are valuable methods in diagnosis of CVST. Conventional T1 and T2-weighted MR images can directly show the thrombus in the dural sinuses, as well as the secondary parenchymal changes that result from venous outflow obstruction. On MR venography, a thrombosed dural sinus does not show the normal flow signal of the sinus nor an irregular filling defect of the sinus, as in our case (4, 9). The treatment of CVST is still a controversial issue.

There is not enough evidence for the efficacy of anticoagulant therapy in patients with CVST but it was showed that heparin could be safely used in patients with hemorrhagic infarct (10). For this reason the anticoagulant therapy was used in our case.

**CONCLUSION**

Despite advanced imaging modalities, CVST is a difficult diagnosis when it is not clinically suspected. CVST should be considered for the differential diagnosis of patients who were admitted to the emergency department with epilepsy or epileptiform seizures and both MRI and MRV should be used for the diagnosis.

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