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Multifocal Intracerebral Hemorrhages: A Rare Presentation in a Patient of Cerebral Venous Sinus Thrombosis

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ABSTRACT

Cerebral venous sinus thrombosis (CVST) is a rare cerebrovascular disease, accounting for 1% of all strokes occurring when a blood clot forms in any of the venous sinuses of the brain. CVST commonly presents as severe headache, seizures, focal neurological deficit, nausea and vomiting. Presentation of CVST in the form of multifocal intracerebral hemorrhage (ICH) is an extremely rare occurrence. We report a case of a 29-year-old male presenting with multifocal ICH and seizures with underlying CVST. The finding of multifocal ICH was incidentally found on brain radio imaging and further workup revealed underlying CVST. This case report underscores the importance of brain radio imaging in an otherwise normal patient presenting with seizure disorder. CVST as an etiology for multifocal ICH is a very rare yet significant phenomenon.

Keywords: Multifocal intracerebral hemorrhage, cerebral venous sinus thrombosis, seizures, metabolic syndrome

Cerebral venous sinus thrombosis (CVST) is a rare cerebrovascular disease, accounting for 1% of all strokes, but with a mortality rate as high as 10%. There are many causes and risk factors of CVST, such as pregnancy, oral contraceptive use, infection, trauma, central nervous system (CNS) tumor, metabolic syndrome and coagulopathies. Initial presentation of CVST as intracerebral hemorrhage (ICH) is rare and further as multifocal ICH is rarest. Few common clinical features of CVST may be in the form of headache, giddiness, nausea, vomiting, seizure and focal neurological deficit, out of which, headache is the commonest presentation, found in up to 77% in some studies.

Despite the advances in the recognition of CVST in recent years, the diagnosis and treatment may be difficult because of the diversity of underlying risk factors.

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The reported incidence of spontaneous solitary ICH in CVST is around 33%; however, multifocal (at 2 or more sites within 48 hours) ICH is much more uncommon.

Hence, we are reporting a case of multifocal ICH in a patient with underlying CVST.

CASE REPORT

A 29-year-old male, taxi driver by occupation, was admitted to medical ward with history of first episode of abnormal body movements in the form of generalized tonic-clonic type with frothing from mouth and loss of consciousness, which remained for 20 minutes. There was a history of postictal confusion and headache, which persisted for 2 hours. He had no significant history of alcohol intake and head injury. Past history and family history were unremarkable.

General physical examination at the time of admission revealed that he was drowsy, not oriented to time, place and person, with Glasgow Coma Scale (GCS) $E_3V_2M_5$. His blood pressure was 160/104 mmHg and rest of the vitals were normal. After recovery from postictal confusion state, patient was examined thoroughly and found to have a height of 199 cm weighing 100 kg. His body mass index (BMI) was 25.25 kg/m^2. His waist circumference was 118 cm and hip circumference was 96 cm, with waist-hip ratio of 1.23. CNS examination revealed no focal neurological deficit.

So, a clinical diagnosis of seizure disorder with hypertension was suspected and an urgent noncontrast computed tomography (NCCT) head was ordered.

The NCCT head showed multiple hyperdense focal areas in right frontal and parietal lobes suggestive of multifocal ICH (Fig. 1). The patient was subjected to further extensive workup.

His hemogram showed hemoglobin level of 14.4 g% with erythrocyte sedimentation rate (ESR) of 25.

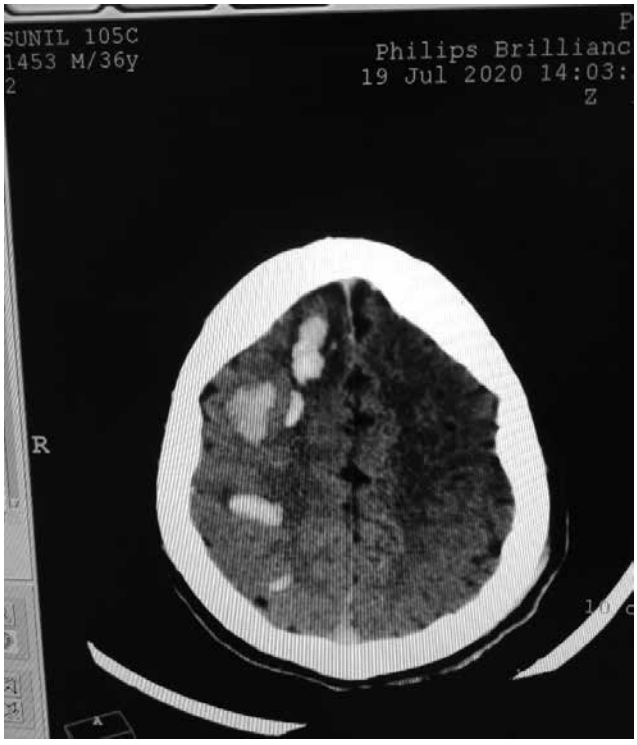

Figure 1. NCCT showing multifocal ICH in right cerebral hemisphere.

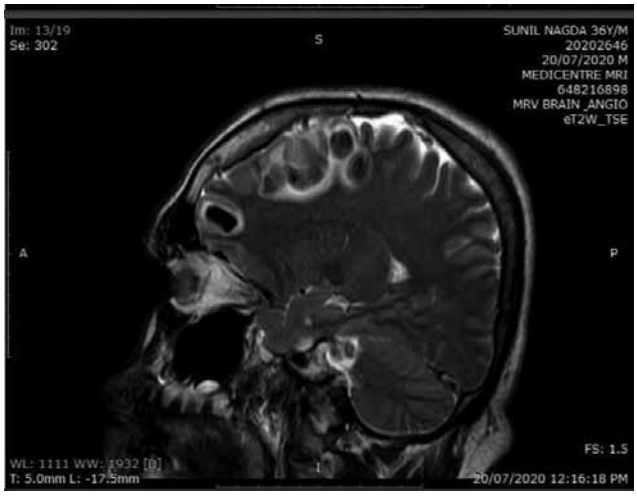

Figure 2 a. MR brain sagittal section showing multifocal ICH.

The total leukocyte count (TLC) and platelet counts were within normal limits. Other routine investigations like renal function test (RFT), liver function test (LFT), serum electrolytes and urine examination were within normal limits. His fever profile consisting of MP QBC, dengue and scrub typhus came out negative. His C-reactive protein (CRP) level was elevated to 14.74 mg/L. His coagulation profile, consisting of activated partial thromboplastin time (aPTT), prothrombin time-international normalized ratio (PT-INR), bleeding time (BT) and clotting time (CT), were normal. Fasting lipid profile revealed an elevated triglyceride level of 183 mg/dL and fasting blood sugar level was 114 mg/dL. His serum homocysteine level was 24.66 μmol/L (Normal reference range 5.46-16.2).

A diagnosis of metabolic syndrome or syndrome X was also established.

X-ray chest and electrocardiogram (ECG) were normal. Ultrasonography (USG) abdomen showed fatty liver.

Considering the atypical presentation and the nature of bleed, further radio imaging of the brain in the form of magnetic resonance (MR) brain, MR angiogram and MR venogram were ordered.

MR brain showed multiple acute intraparenchymal hemorrhages in cortical and subcortical aspect of right frontal and parietal lobes with mild perilesional edema. Largest measuring 2.8 × 1.5 cm. Figure 2 shows MR brain findings.

MR venography revealed acute cerebral venous thrombosis in superior sagittal sinus, right transverse sinus and right sigmoid sinus. On post contrast study, filling defect was noted.

MR angiography appeared normal.

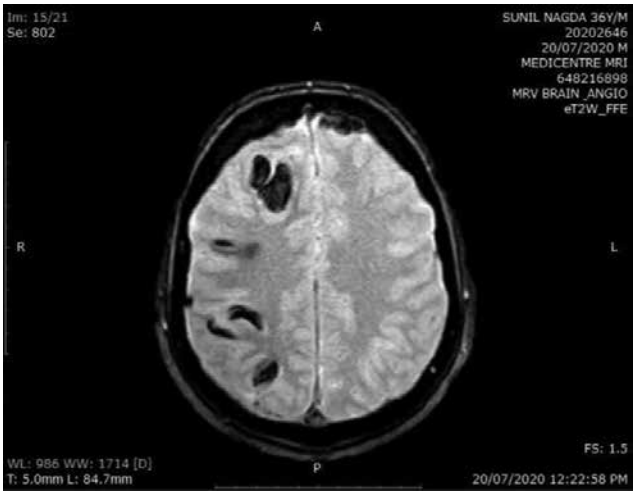

Figure 2b. MR brain transverse section showing multifocal ICH in right cerebral hemisphere.

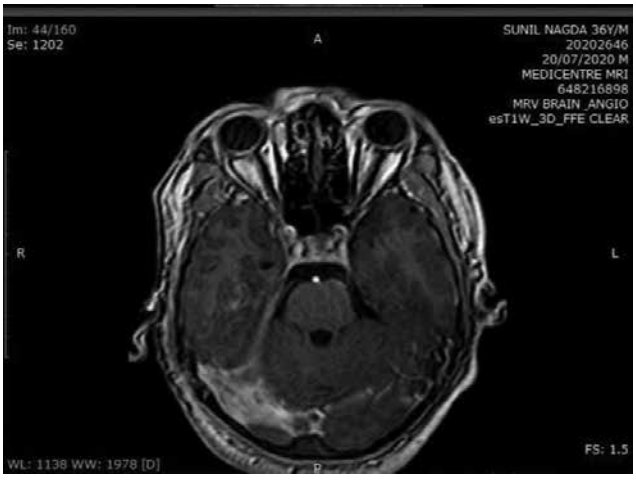

Figure 2c. MR brain showing right side cerebral venous sinus thrombosis.

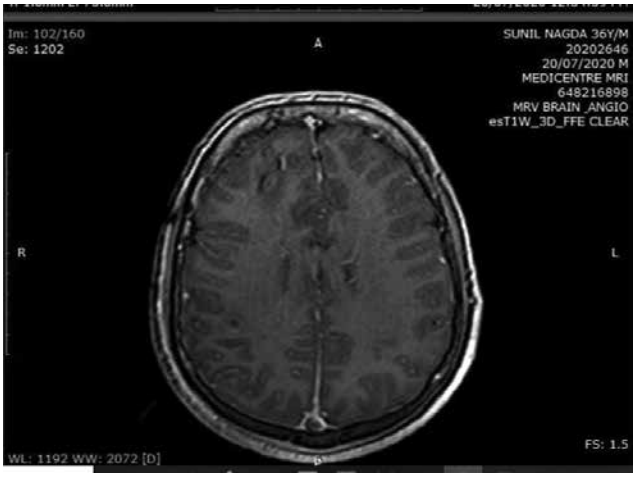

Figure 2d. MR brain showing filling defect in venous sinuses.

Patient was treated with antiepileptic medications for seizure control. Parenteral anticoagulant enoxaparin was given for 5 days with oral warfarin overlap. Patient was discharged after satisfactory management and asked to follow-up at Medical OPD with INR report.

DISCUSSION

Cerebral venous sinus thrombosis occurs when a blood clot forms in any of the venous sinuses of the brain. Approximately 5 people per million are affected by CVST and it accounts for approximately 1% of all stroke events. There may be a lot of risk factors of CVST, such as female gender, pregnancy, oral contraceptive use, infection, trauma, CNS tumor, metabolic syndrome and coagulopathies. CVST is extremely rare in young adult males. The probable risk factor in our patient may be metabolic syndrome. Although CVST is observed with increasing frequency in daily practice and has a variety of non-specific clinical symptoms, its presentation with an associated ICH *via* CT and magnetic resonance imaging (MRI) is infrequent. In patients with CVST, spontaneous intracranial hemorrhage accounts for 30-40% of ICH. ICH induced by CVST encompasses simple cerebral hemorrhage and venous infarction hemorrhage. The distribution of venous infarction hemorrhages does not agree with the normal distribution of simple cerebral hemorrhage. The hematoma is usually seen closer to the surface of the brain, with a large area of low-density around the focal point. The earliest presentation of CVST with ICH is intramedullary or subcortical meniscus hemorrhage; zebra striated hemorrhage is also a common feature of this combination. Increased venous and capillary pressure lead to diapedesis of red blood cells, followed by rupture of small vessels. ICH might therefore represent an extension of this sequence of events. Among patients with lobar ICH of otherwise unclear origin or with cerebral infarction that crosses typical arterial boundaries, imaging of the cerebral venous system should be carried out.

Multiple simultaneous ICH is an uncommon event and has been observed in only 2% of hemorrhagic strokes. Yen et al reported an incidence of 0.8% for simultaneous multiple ICH among intracranial hemorrhages. In simultaneous multiple ICHs, it is most commonly seen in the bilateral thalami followed by the putamen. Due to the limited number of reported cases, the underlying pathology is still unclear. The causative factors include hypertension, multiple micro-bleeding, cerebral amyloid angiopathy, vasculitis, administration of intravenous tissue plasminogen activator, asphyxiation, deep cerebral vein thrombosis and neoplasm. These causative factors appear to be similar to those for single spontaneous ICH

CONCLUSION

Cerebral venous sinus thrombosis is an uncommon disorder in young adult males. A CVST presenting with multifocal hemorrhages on radio imaging and seizure episode is very rare. Like other risk factors, metabolic syndrome is a significant cause for CVST. This case report underlines the importance of an urgent radio imaging in an otherwise normal patient presenting with seizure disorder. CVST as an etiology for multifocal ICH is a very rare, yet significant phenomenon.

SUGGESTED READING

1. Saposnik G, Barinagarrementeria F, Brown RD Jr, Bushnell CD, Cucchiara B, Cushman M, et al; American

Heart Association Stroke Council and the Council on Epidemiology and Prevention. Diagnosis and management of cerebral venous thrombosis: a statement for healthcare professionals from the American Heart Association/ American Stroke Association. Stroke. 2011;42(4):1158-92.

2. Iurlaro S, Beghi E, Massetto N, Guccione A, Autunno M, Colombo B, et al. Does headache represent a clinical marker in early diagnosis of cerebral venous thrombosis? A prospective multicentric study. Neurol Sci. 2004;25 Suppl 3:S298-9.
3. Stam J. Thrombosis of the cerebral veins and sinuses. N Engl J Med. 2005;352(17):1791-8.
4. van Asch CJ, Luitse MJ, Rinkel GJ, van der Tweel I, Algra A, Klijn CJ. Incidence, case fatality, and functional outcome of intracerebral haemorrhage over time, according to age, sex, and ethnic origin: a systematic review and meta-analysis. Lancet Neurol. 2010;9(2):167-76.
5. Jin-Suk Seo, Taek-Kyun Nam, Jeong-Taik Kwon, Yong-Sook Park. Multiple spontaneous simultaneous intracerebral hemorrhages. J Cerebrovasc Endovasc Neurosurg. 2014;16(2):104-11.
6. Sun J, He Z, Nan G. Cerebral venous sinus thrombosis presenting with multifocal intracerebral hemorrhage and subarachnoid hemorrhage: A case report. Medicine (Baltimore). 2018;97(50):e13476.
7. Minami K, Iida M, Iida H. Case report: central venous catheterization via internal jugular vein with associated formation of perioperative venous thrombosis during surgery in the prone position. J Anesth. 2012;26(3): 464-6.
8. Tanno H, Ono J, Suda S, Karasudani H, Yamakami I, Isobe K, et al. Simultaneous, multiple hypertensive intracerebral hematomas: report of 5 cases and review of literature. No Shinkei Geka. 1989;17(3):223-8.
9. Chanda A, Nanda A. Multiple cavernomas of brain presenting with simultaneous hemorrhage in two lesions: a case report. Surg Neurol. 2002;57(5):340-4; discussion 344-5.
10. Kase CS, Pessin MS, Zivin JA, del Zoppo GJ, Furlan AJ, Buckley JW, et al. Intracranial hemorrhage after coronary thrombolysis with tissue plasminogen activator. Am J Med. 1992;92(4):384-90.
11. Ooneda G, Yoshida Y, Suzuki K, Sekiguchi T. Morphogenesis of plasmatic arterionecrosis as the cause of hypertensive intracerebral hemorrhage. Virchows Arch A Pathol Pathol Anat. 1973;361(1):31-8.

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85% of a Seattle Fishing Boat Crew Got Infected on Board with COVID-19 in May

The crew had tested negative for infection and had blood drawn before departure.

On return, the three people who had neutralizing antibodies prior to departure were not infected on the ship.

- How long are COVID-19 antibodies protective? It is based on the titers, or the concentration of antibodies, in a person's blood.
- Individuals with more severe COVID-19 infection probably have more antibodies, which could possibly protect them from reinfection for a year or beyond. Milder infections lead to fewer antibodies and could possibly protect for up to 6 months.
- Nearly 10% of people don't exhibit a very strong immune response in mild infection. Those people would have a much higher risk for reinfection. Those reinfections are usually milder and the people are asymptomatic.
- Virus is always mutating. It undergoes two mutations a month. COVID-19 has been around for 10 months in people. Influenza, respiratory syncytial virus (RSV), other respiratory viruses and have been circulating in people for hundreds of years or in different animal hosts that can infect people.
- Across the whole antibody and clinical lab spectrum, there are two different antigens - the nucleocapsid, which wraps the genome, and the spike protein, which binds the cells.
- Most of the tests done in the United States are done against the nucleocapsid, as it is the most sensitive assay.
- We need antibody tests that show that spike, the outside glycoprotein from the virus that is associated with attachment and entry.
- But this is not what current labs are doing. The market is 75-80% nucleocapsid, and only 20% spike.
- For the receptor-binding domain, we look at the outside of the spike, the part that binds the receptor.

(*Source: Medscape*)