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REVESIBLE PARKINSONISM SECONDARY TO DCVST.

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Introduction:

Cerebral venous thrombosis refers to local clot formqtion and occlusion of intracranial venous structures. Cerebral venous sinus thrombosis (CVST) is a serious condition that manifests with a broad range of symptoms and indications. Approximately 10% of CVST patients experience involvement of the deep venous system, often alongside other sinuses and cortical veins. Typically, headache and altered mental state are the most prevalent clinical manifestations in cases of deep CVST (DCVST). However, it is exceedingly uncommon for DCVST to present as a movement disorder. Akinetic mutism is a rare neurological condition characterized by a state of reduced or absent voluntary movement and speech. It is typically caused by damage to the frontal lobe of the brain, often resulting from vascular abnormalities or lesions. One such potential cause is a dural arteriovenous (AV) fistula following cerebral venous thrombosis.

In this article, we present the case of a patient with DCVST who exhibited acute bradykinesia and impaired consciousness, accompanied by CT findings. (1,2)

Case:

A 49 year old male patient, known case of cerebral venous thrombosis, came with the complaints of decreased speech and responsiveness since one day, along with difficulty in walking. Upon examination, he was found to be conscious, oriented and responding to commands in addition to moving his limb son painful stimuli. Rigidity and bradykinesia were noted in both limbs. However, he did not have any tremors or postural hypotension. His vitals were stable, and he had a GCS

score of E4V2M1 upon admission. He was empirically prescribed injection low molecular weight heparin 0.6 mg and injection mannitol, ¯ and CT brain was adviced, upon suspicion of dural AV fistula or parkinsons disease or akinetic mute state. CT brain revealed the presence of a chronic thrombus with partial recanalization of superior saggital sinus, left transverse and sigmoid sinuses. The impression of dural arteriovenous fistula for DSA correlastion was given. The patient was shifted to ICU, where LMWH, injection thiamine, furosemide and IV fluids were given. Since sudden tachycardia developed, a cardiology opinion was sought, but the patient was stable therafter. Following appropriate anticoagulation, the patient showed remarkable improvement and was discharged.

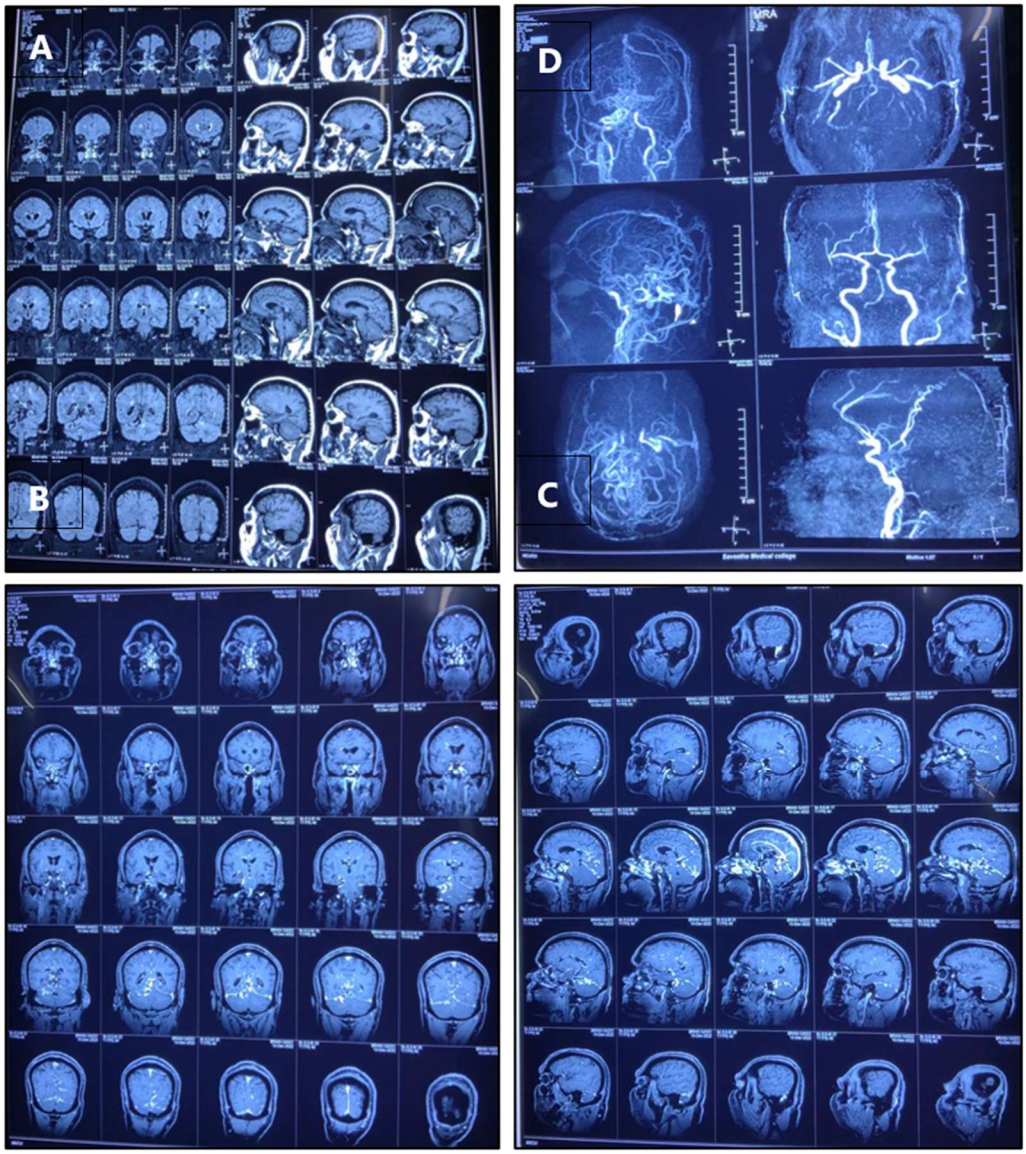

Fig.1. Brain CT/MRA findings: CT (A,B,C) confirmed presence of a chronic thrombus with partial recanalization of superior saggital sinus, left transverse and sigmoid sinuses. MRA (D) also shows the presence of a dural AV fistula

Discussion:

Cerebral venous sinus thrombosis (CVST) is a relatively rare but serious condition characterized by the formation of blood clots in the cerebral venous sinuses, which are the large veins that drain blood from the brain. Unlike arterial strokes that involve blockages in the arteries supplying oxygen-rich blood to the brain, CVST affects the veins responsible for draining deoxygenated blood and waste products from the brain.(1,3)

The exact cause of CVST is often multifactorial and can include factors such as genetic predisposition, hormonal changes, infections, head injuries, certain medications, and underlying health conditions like autoimmune disorders or blood clotting disorders. The formation of blood clots in the cerebral veins disrupts the normal blood flow and can lead to a variety of symptoms.

Dural arteriovenous (AV) fistula on the other hand, is an abnormal connection between arteries and veins in the dura mater, the outermost layer of the brain covering. It is a relatively rare condition that can occur spontaneously or as a result of trauma, infection, or previous surgery.

In some cases, a dural AV fistula may develop following cerebral venous thrombosis. This can happen when the clot formation within the cerebral veins leads to a disruption in normal blood flow and pressure dynamics. The altered blood flow patterns can cause the formation of abnormal connections between arteries and veins within the dura mater, resulting in a dural AV fistula.(4)

The presence of a dural AV fistula following cerebral venous thrombosis can lead to various clinical manifestations. Patients may experience symptoms such as headache, pulsatile tinnitus (a ringing sound in the ears synchronized with the heartbeat), visual disturbances, neurological deficits, or even intracranial hemorrhage in severe cases. Rarely, as in our case, it may also lead to reversible parkinsonism-like features presenting as rigidity and bradykinesia, as presented by Algahtani et al.(5)

The diagnosis of a dural AV fistula following cerebral venous thrombosis typically involves a combination of imaging techniques. Magnetic resonance imaging (MRI) plays a crucial role in visualizing the venous system and identifying the presence of a clot. Magnetic resonance venography (MRV) can provide detailed images of the cerebral veins, aiding in the detection of abnormal blood flow patterns. However, the gold standard for diagnosing dural AV fistulas is digital subtraction angiography (DSA). DSA is an invasive procedure where a contrast dye is injected into the blood vessels, allowing for precise visualization and identification of the abnormal connections between arteries and veins. DSA can also help determine the location, severity, and specific characteristics of the dural AV fistula, guiding treatment decisions. A comprehensive evaluation utilizing these imaging modalities is essential for an accurate diagnosis of dural AV fistula following cerebral venous thrombosis.(6,7)

The treatment of a dural AV fistula following cerebral venous thrombosis typically involves a multidisciplinary approach. The specific treatment strategy depends on various factors such as the location, severity, and characteristics of the fistula.

Endovascular procedures are commonly employed as the first-line treatment option. Embolization techniques involve the insertion of a catheter into the blood vessels to deliver embolic agents, such as coils or glue, to block the abnormal connections and restore normal blood flow. In more complex cases, surgical intervention may be necessary to remove or repair the fistula. Prosperini et al., have described a case of reversible parkinsonism following DAVF, successfully treated with an endovascular procedure. (8)

Additionally, anticoagulant therapy may be used to manage the underlying cerebral venous thrombosis and prevent further clot formation. Close monitoring of symptoms, imaging studies, and follow-up evaluations are important to assess treatment response and ensure optimal outcomes.

The choice of treatment modality is determined on a case-by-case basis, taking into consideration the patient's overall health, the characteristics of the dural AV fistula, and the expertise of the medical team. Collaborative decision-making between neurosurgeons, interventional radiologists, and other specialists is essential to tailor an individualized treatment plan for each patient.(9,10)

Conclusion:

The occurrence of Parkinsonism-like features in the context of deep cerebral venous sinus thrombosis (DCVST) is quite uncommon. The reversibility of the CT-detected venous infarction changes observed in our patient is attributed to elevated transcapillary and interstitial pressure resulting from the venous thrombosis. Our case is intriguing not only due to its rarity but also due to the remarkable response to treatment, with complete clinical and radiological recovery following use of low molecular weight heparin. Despite its infrequency, DCVST should be considered as a potential structural cause of Parkinsonism, particularly considering the positive outcomes observed with anticoagulation therapy.

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