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Incidence of Dural Arterio Venous Fistula Following Cerebral Venous Sinus Thrombosis: An Exceptional Case Report

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Abstract

Cerebral venous sinus thrombosis (CVST) illustrates multifactorial aetiology with varied clinical characteristics and is frequently linked to challenging diagnosis and inconstant prognosis, which necessitates for suitable medical skills and great suspicious index. The existing case report depicted the growth of dural arteriovenous fistula (DAF) due to CVST in young female patient with changed biochemical as well as radiological indicators. Twenty-nine years old female patient was brought to hospital for dizziness and seizures. Glasgow Coma Scale was documented as E4 V5 M6 on first day of admission. Plain Computed Tomography outlined hypodensities in right basifrontal as well as periventricular areas close to frontal horn of right lateral ventricle. Cerebral Angio scan (DSA) showed elevated flow dural AV fistula of left transverse sigmoid junction. Serum urea (47 mg/dl) and serum creatinine (1.6 mg/dl) levels were found to be elevated. Patient was effectively operated through 'endovascular embolization with Onyx' as a part of emergency treatment protocol. She was supplemented with satisfactory postoperative care, followed up and discharged. Early clinical assessment, appropriate imaging technique and careful evaluation and treatment support can be key steps in managing patients of DAF following CVST. Onyx embolization may be practicable, active and lifesaving strategy in effective management of DAF accompanying with CVST in young patients.

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Key words: Cerebral Venous Sinus Thrombosis; Dural Arterio Venous Fistula; Onyx Embolization

Introduction

Cerebral venous sinus thrombosis (CVST) is an unusual form of venous thromboembolism (VTE). It attributes nearly 0.5-3% of all types of stroke, affecting predominantly young people. [1, 2] Nevertheless, the post CVST developed 'Dural Arteriovenous Fistula' (DAF) is infrequent occurrence and is documented among restricted number of patients. CVST shows multifactorial risk factors with different clinical features and is supplemented with hard diagnosis and inconstant prognosis, which requires sufficient medical/clinical skills and significant suspicious index. [1-3]

Till now, sparse studies have reported cases comprising DAF and CVST. The current case report revealed the development of DAF following CVST in young female patient with diverse biochemical parameters and evident radiological findings.

Case Report

Twenty nine years old female patient with pre-existing health problems was suffered with dizziness and seizures for four days. It was progressed by several episodes of nausea, vomiting and headache for two days. On admission, the clinical characteristics were abrupt in onset however successively became steadily progressive. On arrival, her Glasgow Coma Scale was noted to be E4 V5 M6. The neurological assessment detected hypertonia in both the limbs with bilateral down going planter response. Plain Computed Tomography (CT) defined hypo densities in right basifrontal as well as periventricular portions in vicinity of frontal horn of right lateral ventricle.

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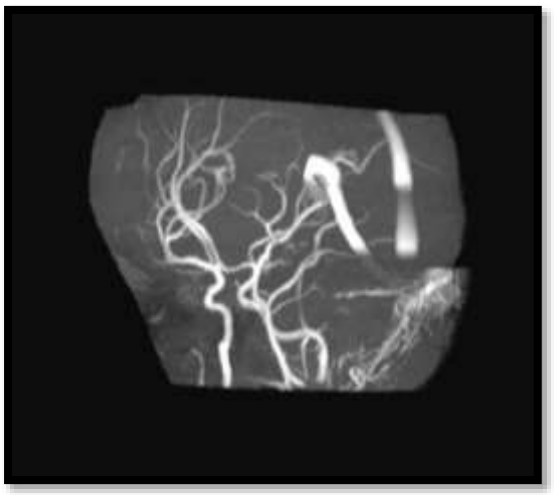

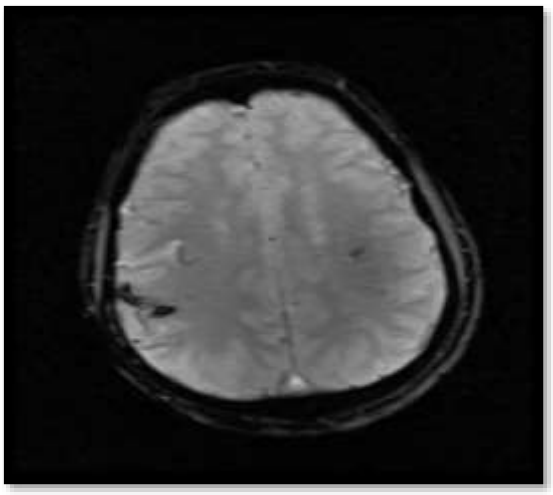

Figure 1 **Figure 2**

Figure 1: MRV (Magnetic Resonance Venography) image of Dural AV Fistula, **Figure 2:** Multiple Flow vide images in Left Parieto-temporal region.

CT scan also delineated diffuse cerebral vessels and venous sinus hyper densities containing all main intracranial arteries, straight and sigmoid sinuses. Cerebral D time-of-flight (TOF) venography indicated lack of flow signals in right transverse sinus, representing hyperintense signal in T1/ Flair and blooming in GRE. Dilated left transverse sinus and limited arterial feeders were also noticed at left temporo-occipital and left retro cerebellar portion.

Cerebral Angio scan (DSA) showed elevated flow dural AV fistula of left transverse sigmoid junction. The back flow was also noted into dural venous sinuses from both superficial as well as deep cortical veins. Venous out flow of brain was sluggish with substantial venous congestion. Haematological parameters were within normal limits. Cerebrospinal fluid (CSF) analysis revealed signs of elevated intracranial pressure with altered levels of glucose, protein, and polymorphonuclear leucocytes. Serum glutamic-pyruvic transaminase and Serum glutamic-oxaloacetic transaminase levels were 42 IU/L and 28 IU/L respectively. Serum urea (47 mg/dl) and serum creatinine (1.6 mg/dl) levels were raised. There was upsurge in levels of serum electrolytes (Na – 139 mEq/L, K – 4.4 mEq/L). There was no any history or evidence of polycythaemia, malignancy or injury. The case was treated for seizures with deep

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CVST. She was given subcutaneous enoxaparin 1mg/kg twice daily, tablet Brivasure 50 mg twice daily, intravenous infusion 100 cc thrice daily for two days and tablet Frisium 10 mg once daily. The case was effectively treated with 'endovascular embolization with Onyx' on emergency protocol. She was provided suitable postoperative care, followed up and she was discharged from the hospital.

The present case was chosen from our regular clinical practice and discussed for internal learning. It was not submitted to the Institutional Ethics Committee. However, an informed consent was attained from the patient and relatives of patient regarding publication of this case report and the confidentiality about patient and her illness was ensured in whole study.

Discussion

One of the major features of DAF secondary to CVST is its development adjacent to a thrombosed sinus. [4-6] Several theories have been generally postulated for the pathogenesis of DAF. The primary theory is related to re-generating of pre-existing channels through venous hypertension and the other major theory is based on hypoxia persuaded angiogenesis. [5-7] Though, in present case, thrombosis was detected in straight, sigmoid, transverse sinus as well as in all main intracranial arteries. The reverse flow from cortical veins into dural venous sinuses was observed with considerable venous congestion. The generation of retrograde flow through cortical veins seems to be significant risk factor and patient is likely to suffer lethal complication like intracerebral haemorrhage. It requires proactive assessment and speedy management. Nevertheless, in current case, patient was stabilized with prompt suitable treatment. Parallel conclusions were also stated in the study of Min Kyoung Kang et al. [8] It is vital to understand that, in this case, maximum locations of CVST were either the sinuses contiguous to DAF or the sinuses in the downstream pathways of the venous flow from the DAF. Nearly 40% of patients with CVST would have seizures as the presenting clinical sign

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or symptom. [8-10] The existing case report supports with this fact, as it was identified as one of the key complaints experienced by patient on admission.

In numerous DAF cases, there is always probability of missing pre-existing CVST. This could be ascribed to intrinsic challenges in identifying CVST due to poorly defined aetiology, inadequate availability of highly sensitive imaging procedures etc. It is difficult to assess that all DAF cases are interrelated with CVST and it is vital to note that CVST does not often cause DAF. Though, high index of suspicion need to be predicted in gauging the causal association between CVST and DAF. Prompt diagnosis and rapid treatment of CVST might be beneficial in avoidance of DAF among several patients.

Conclusions

Even if the dural arteriovenous fistula is a uncommon clinical encounter, high index of clinical suspicion, suitable imaging technique and assessment helps in choosing appropriate treatment preference. Onyx embolization may be practicable, effective and lifesaving measure in management of DAF related with CVST especially among young patients.

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