



POSTERIOR CIRCULATION ISCHEMIC STROKE IN ASSOCIATION WITH BASILAR ARTERY FENESTRATION: A CASE REPORT

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ABSTRACT

Cerebrovascular fenestration malformation is a rare congenital vascular malformation. These malformation rarely directly leads to cerebral infarction. Cases of young patient with basilar artery fenestration and posterior circulation infarct without traditional stroke risk factors are rare and not widely reported.

KEYWORDS : Basilar artery fenestration, posterior circulation infarct.

INTRODUCTION

Basilar artery (BA) fenestration, defined as a segmental duplication, is a developmental abnormality due to aberrant fusion of primitive longitudinal neural arteries in the fifth week of fetal life. BA fenestration is the second most reported fenestration of the cerebral arteries. Duplication or fenestration of the basilar artery, a result of embryologic malformation, has an incidence of up to 5.3% in the general population. It has been associated with aneurysms and posterior circulation infarcts. Hemodynamic disturbances and turbulent flow at the site of fenestration may cause thrombosis and ischemic stroke.

Here we report a case of young posterior circulation stroke in association with this rare anatomical variant.

Case Report:

A previously healthy 36 year old male with no addiction presented with chief complains of vertigo, nausea and vomiting and imbalance while walking for three days. Onset of symptoms was sudden in onset and static for last three days. Pt complain of vertigo that was continuous and associated with nausea and vomiting. Patient has difficulty in walking in form imbalance and need slight support to walk. No past history of stroke and transient ischemic attack. Family history for stroke was absent.

On examination- patient was conscious, oriented to time/place/person. Cranial nerve examination, motor system examination (tone, bulk and power), deep tendon reflexes, sensory system examination was normal. On cerebellar system examination- left gaze evoked nystagmus and gait ataxia present.

On investigation-

Hemoglobin	16.0 gm/dl
Total WBC	4910/uL
Platelet count	1,12,000/uL
MCV	93.3 fl
HCT	48.8 %
HDL	47 mg/dl
VLDL	26.60 mg/dl
LDL	110.4 mg/dl
Cholesterol	184 mg/dl
Triglyceride	133 mg/dl
Serum TSH	3.21 uIU/ml
HBA1C	5.7%
Serum vitamin B12	175 pg/ml (low)
Serum bilirubin	1.2 mg/dl
SGOT/SGPT	36/76 IU/L

Serum creatinine	1.08 mg/dl
Serum urea	27 mg/dl
Na/K/Cl	140/3.8/106 mmol/L
PT/INR	13.9 sec/ 1.06
APTT	30.3 sec
Thrombin Time	21 sec
Serum fibrinogen	163 mg/dl
Anti thrombin 3	101 %
Lupus anticoagulant (by dilute Russell's viper venom method)	0.9
ANA (by IFA)	negative
ANCA (by IFA)	negative
Anti ds DNA	negative

ECG, 24hour Holter report, 2D echo was normal. Bilateral carotid and vertebral artery doppler were normal. MRI Brain showed acute infarcts in left cerebellar hemisphere. Carotid CT angiography was normal, Cerebral CT angiography showed basilar artery fenestration and hypoplastic right anterior cerebral artery.

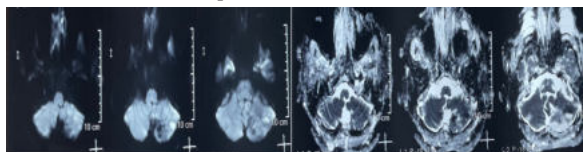


Fig 1: Mri Brain Showed Acute Infarcts In Left Cerebellar Hemisphere



Fig 2: Cerebral CT angiography showed basilar artery fenestration and hypoplastic right anterior cerebral artery.

The patient's neurological symptoms recovered over next seven days, and he was discharged on prophylaxis aspirin and clopidogrel therapy.

DISCUSSION:

Arterial fenestration is rare but well known vascular variation

that is a localized duplication of an artery, with a divided arterial lumen. Most frequent sites in cerebral circulation are anterior communicating region and basilar artery. Some cases of cerebral artery fenestration with cerebral ischemia are reported; most of these cases are adults, except two cases in children. Bernard et al reported eighteen year old male with recurrent stroke and vertebral artery fenestration. Some cases of basilar artery fenestration and ischemic stroke are reported. Fenestration can occur in any part of basilar artery, but it is most common in the proximal area.

The blood flow disturbance in BA fenestration may increase risk of thrombus formation, instability of plaque and subsequent ischemic stroke. Patient with BA fenestration had higher oscillatory shear index (OSI), time- averaged wall shear stress gradient (TAWSSG), surface area ratio (SAR) – TAWSSG at the flow confluence of the BA fenestration, especially in the middle sidewall. Thus fenestration can disturb the flow hemodynamic pattern and Oscillatory shear index values are associated with changes in endothelial gene expression, inflammatory cell activation, and lipid accumulation. The flow confluence segments of BA fenestration are high risk location for thrombus formation, plaque development, and rupture. In addition fenestration has been associated with aneurysm and hemorrhagic stroke.

Treatment of patient with cerebral infarction and fenestration is unclear. In most of the case reports conventional treatment approach was used and included antiplatelet and statins therapy. Vascular interventional therapy need to be explored. Basilar artery fenestration, in the absence of another risk factor that we can detect in our case and the compliance of infarct area with the blood supply from fenestrated basilar artery, may be the aetiology of ischemic stroke development. Further studies or increase of similar case reports may support this view.

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