Eastern Green Neurosurgery Case Report

egneuro,05(01):40-43,2024

Dolichoectasia of Basilar Artery in Hypertensive Putaminal Bleed

Sugam Yadav[1], Ram Chandra Sah[1], Karuna Tamrakar[1]

[1]Department Neurosurgery B and C Medical College and Teaching Hospital Birtamode, Jhapa, Nepal

Correspondence:
Dr. Karuna Tamrakar Karki M.Ch
HOD, Department of Neurosurgery
B and C Medical College and Teaching Hospital Birtamod, Jhapa, Nepal
Email: tamrakarkaruna@gmail.com

Background: Dolichoectasia is a fusiform dilation of vascular structure that can occur anywhere in circulatory system. It is mostly detected and confirmed in the intracranial circulation in angiography. The vertebrobasilar system is the most common location. Putamen bleed has not been reported in association with vertebrobasilar dolichoectasia so far. Here, we report a rare case of detecting dolichoectasia of basilar artery in digital subtraction angiography with left putamen bleed in a middle-age hypertensive gentleman on irregular antihypertensive medication.

Key words: Basilar artery; Dolichoectasia; Digital subtraction angiography; Hypertension; Putamen bleed

Dolichosis is elongation or abnormal curvature of the vessel and ectasia is an abnormal dilatation of the vessel more than 50% of the normal vessel diameter. Primary diagnosis criteria for basilar artery dolichoectasia are >29.5mm curvature length and bending length is >10mm in MR angiography.[1] Dolichoectasia is an abnormal elongated dilation of intracranial vessel with an incidence rate of 0.06-5.8 %. [2] The possibility of posterior circulation stroke is higher with vertebrobasilar dolichoectasia. The commonest type of dolichoectasia is atherosclerotic and the most common vessel involved is vertebrobasilar system. Fusiform appearance of vertebrobasilar tree is usually detected after 40 years of age with male predominance. [3] Due to fusiform dilatation of major trunk of posterior circulation, it may present with brain stem compressive features clinically or with cerebrovascular accidents. Cranial nerve palsies, cerebellar signs, motor deficits, central sleep apnea, trigeminal neuralgia, features of

hydrocephalus may sometimes be revealed clinically with dolichoectasia of vertebrobasilar trunk. [4,5]

Case description:

Right-handed hypertensive, non-diabetic 48-year-old gentleman from Illam, far-eastern part of Nepal, presented to emergency room with chief complain of sudden onset of headache and slurring of speech and right limb weakness along with facial deviation for 3 hours. Headache was associated with nausea and vomiting. He was a known case of hypertension for more than five years and was not under regular antihypertensive

Date submitted: 21/ 05/2024
Date accepted: 28/05/2024

medications. He was a chronic alcoholic and consumed around 80-100ml of alcohol daily. There was no history of loss of consciousness, seizure, and fever, recent head trauma, taking any blood thinning agents or any other chronic illnesses in the past. His initial blood pressure was 180/120 mmHg with regular pulse rate of 110/minutes. He was afebrile with Glasgow Coma Scale E3V4M6. His pupils were bilateral 2mm reactive. MRC grading in the right upper and lower limbs was 2/5 and was 5/5 in rest of the limbs.

CT head showed (Figure 1) acute left basal ganglia hemorrhage with minimal perilesional edema partially effacing the left lateral ventricle with no midline shift. After initial management in emergency room, patient was admitted in intensive care unit with cardiology, medicine and psychiatry consultation. Repeat CT head was done to rule out increase in size of hematoma and its mass effect, however, blood density or dilated elongated tortuous vessel like structure demonstrated in interpeduncular cistern was noted (Figure 2). He was planned for Digital Substraction Angiography (Figure 3) and revealed elongated, tortuous and fusiform dilatation of entire basilar artery beginning from the vertebral artery bifurcation to basilar top.

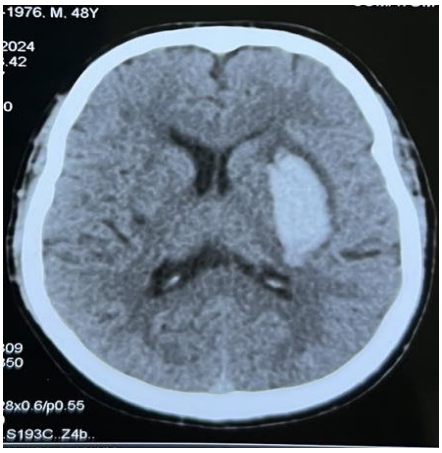

Figure 1: 20-25 ml of acute left putamen hemorrhage with minimal perilesional edema partially effacing the left lateral ventricle with minimal midline shift.

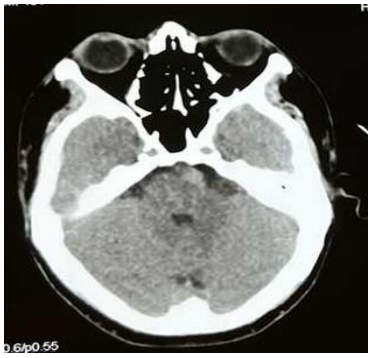

Figure 2: non contrast CT head axial view: Elongated and dilated basilar artery demonstrated in interpeduncular cistern.

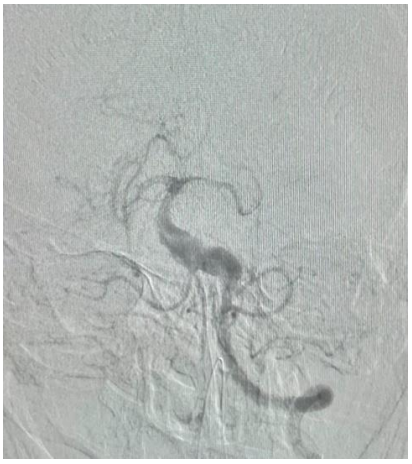

Figure 3: Digital subtraction angiography: left vertebral injection, anterior posterior view showing elongated, tortuous and fusiform dilatation of entire basilar artery beginning from the vertebral artery bifurcation to basilar top.

Discussion:

Basilar artery begins from junction of medullo-pontine and ends at junction of pons and mid brain. Dolichoectasia is term that refers to elongated, dilated, tortuous and partially displaced basilar artery with a diameter of >4.5 mm. [1] It lies at the margin of cavus or dorsum sellae or it bifurcates above plane of suprasellar cisternae and may be considered elongated. [6] Most common clinical presentation of dolichoectasia is acute brain ischemia with progressive course related to the compression of the cranial nerves, brainstem or the 3rd ventricle.[6] The pathophysiology of

intracranial arterial dolichoectasia is unclear; however multiple pathophysiological processes might contribute to the development of such arterial ectasia vessels have been reported, such as systemic arterial hypertension associated with atherosclerosis.[7] In histopathology, degeneration of the internal elastic lamina and thinning of the media secondary to smooth muscle atrophy is noted. [8] This supports the fact that atherosclerosis mainly involves the intima and endothelial layer of larger and medium size vessels, however in dilatative arteriopathy intimal layer of intracranial arteries is mainly involved.[7,8] There is an increased risk of intracerebral hemorrhage in a patient with vertebrobasilar dolichoectasia. Arteriopathies, hypertensive arteriopathy, amyloid angiopathy, Moyamoya disease, cerebral autosomal dominant arteriopathy with subcortical infracts and leukoencephalopathy are other risk factors of dolichosis and ectasia of vertebrobasilar system.[9] Ichikawa et al had reported that basilar ectasia had a strong association with cerebral microbleeds.[10] Cerebral microbleeds are age related, systemic hypertension, leukoarairosis, amyloid angiopathy, arterial fibrillation and genetic predisposition. [11] Although basilar ectasia is significantly associated with anterior circulation lobar microbleeds and posterior territory, however 70% posterior circulation involvement has been reported with ectasia. [12] Every so often it may result into catastrophic outcome caused by vessel rupture. Treatment of symptomatic cases is still controversial with options ranging from observation, regular clinical and radiological follow up, resection with re-anastomosis, transposition and wrapping. As surgery may be harmful in case of dolichoectasia as any attempt to interfere may carry high risk of ripping off brain stem perforators of basilar artery resulting into posterior circulation stroke.[13]

No appropriate studies evaluating the association between vertebrobasilar dolichoectasia and long-term clinical outcome been found. Multiple studies have mentioned posterior circulation stroke, cerebral microbleeds but no hypertensive deep nuclear bleed has been mentioned so far. This is a first case report of basilar dolichoectasia found in hypertensive putamen bleed reported in English literature.

Conclusions:

Basilar dolichoectasia increases the risk of cerebral microbleed that indicates etiopathogenesis of degeneration in arterial media. However, Putamen bleed has not been reported associated with vertebrobasilar dolichoectasia so far. This is a first case in English literature reporting hypertensive putamen bleed with basilar dolichoectasia. Hence, we neurosurgeons should be aware of the uncommon presentation of vertebrobasilar dolichoectasia causing large basal ganglia hemorrhagic stroke.

References:

1. Ubogu EE, Zaidat OO. Vertebrobasilar dolichoectasia diagnosed by magnetic resonance angiography and risk of stroke and death: a cohort study. J Neurol Neurosurg Psychiatry. 2004;75(1):22-26.

2. Mishra VN, Chaurasia RN, Gupta S, Joshi D. Recurrent facial hemiparesis due to dolichoectatic vertebrobasilar artery: an unusual and ignored cause. BMJ Case Rep. 2013 Mar 15;2013:bcr2012008517. doi: 10.1136/bcr-2012-008517. PMID: 23505276; PMCID: PMC3618728.

3. Doran SE, Deveikis JP, Chandler WF. Dolichoectasia of the anterior cerebral arteries in an adolescent. AJNR Am J Neuroradiol. 1995 Aug;16(7):1548-50. PMID: 7484654; PMCID: PMC8338068.

4. Kansal R, Mahore A, Dange N, Kukreja S. Dolichoectasia of vertebrobasilar arteries as a cause of hydrocephalus. J Neurosci Rural Pract. 2011 Jan;2(1):62-4. doi: 10.4103/0976-3147.80106. PMID: 21716844; PMCID: PMC3123011.

5. Conradie JM, Bonnet EG. Dolichoectasia and Its Diagnostic Criteria: A Case Report and Literature Review. Cureus. 2021 Jan 6;13(1):e12516. doi: 10.7759/cureus.12516. PMID: 33425563; PMCID: PMC7788005.

6. Caplan LR. Dilatative arteriopathy (dolichoectasia): What is known and not known. Ann Neurol. 2005;57(4):469-471. doi:10.1002/ana.20447

7. Yuh SJ, Alkherayf F, Lesiuk H. Dolichoectasia of the vertebral basilar and internal carotid arteries: A case report and literature review. Surg Neurol Int. 2013;4:153. Published 2013 Nov 29. doi:10.4103/2152-7806.122397

8. Milutinović A, Šuput D, Zorc-Pleskovič R. Pathogenesis of atherosclerosis in the tunica intima, media, and adventitia of coronary arteries: An updated review. Bosn J Basic Med Sci. 2020;20(1):21-30. Published 2020 Feb 5.

9. Kleinig TJ. Associations and implications of cerebral microbleeds. J Clin Neurosci. 2013;20(7):919-927. doi:10.1016/j.jocn.2012.12.002

10. Ichikawa H, Mukai M, Katoh H, Hieda S, Murakami H, Kawamura M. Cerebral microbleeds and dilative remodeling of the basilar artery: a magnetic resonance imaging study. J Stroke Cerebrovasc Dis. 2011;20(5):429-435. doi:10.1016/j.jstrokecerebrovasdis.2010.02.015

11. Wu Y, Chen T. An Up-to-Date Review on Cerebral Microbleeds. J Stroke Cerebrovasc Dis. 2016;25(6):1301-1306. doi:10.1016/j.jstrokecerebrovasdis.2016.03.005

12. Osama, A., Negm, M., Mosallam, W. et al. Vertebrobasilar dolichoectasia in patients with cerebrovascular ischemic stroke: does it have a role in cerebral microbleeds?. Egypt J Neurol Psychiatry Neurosurg 58, 154 (2022). https://doi.org/10.1186/s41983-022-00588-1

13. Chao KH, Riina HA, Heier L, Steig PE, Gobin YP. Endovascular management of dolichoectasia of the posterior cerebral artery report. AJNR Am J Neuroradiol. 2004;25(10):1790-1791.