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Case Series

Clinical Spectrum of Anterior Choroidal Artery Infarction: A Case Series

Dr. Sandhya Manorenj*

Department of Neurology, Kerala Institute of Medical Sciences (Kimshealth), Aster DM quality Care limited, Trivandrum, Kerala, India.

***Corresponding Author:** Dr. Sandhya Manorenj, Department of Neurology, Kerala Institute of Medical Sciences (Kimshealth), Aster DM quality Care limited, Trivandrum, Kerala, India.

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Abstract

Background: Anterior choroidal artery (AChA) infarction is uncommon, with limited published data on its clinical spectrum and outcomes.

Objective: To evaluate the risk factors, etiological subtypes, clinical characteristics, radiological findings, and three-month outcomes of AChA infarction.

Methods: A case series included patients with AChA infarction. Demographic, vascular risk, clinical, and radiological data were collected. All patients underwent brain MRI and angiography. Etiology was classified using the TOAST criteria, and functional outcomes were assessed at three months using the modified Rankin Scale (mRS).

Results: Twelve patients were included, eight of whom were male, with a mean age of 45.6 ± 12.65 years. Hypertension was the predominant risk factor (77.7%). Incomplete AChA syndrome occurred in 66.6% of patients. Non-lacunar infarction accounted for 66.6% of cases. Both superficial and deep branches were involved in 58.3%, and the posterior limb of the internal capsule was affected in all patients. Most patients (88.8%) achieved a favourable three-month outcome (mRS ≤2).

Conclusion: AChA infarction commonly presents with incomplete clinical features. Posterior limb of the internal capsule involvement is an important radiological clue. Despite frequent non-lacunar infarction, functional outcomes were generally favourable.

Keywords: *Anterior choroidal artery, stroke, hemiplegia, hemianesthesia, hemianopia.*

Introduction

The anterior choroidal artery (AChA) is a small but functionally important branch of the internal carotid artery (ICA), usually arising 2–5 mm distal to the origin of the posterior communicating artery. [1] Despite its small calibre, it supplies several strategically important structures, including the posterior limb of the internal capsule (PLIC), optic tract, lateral geniculate body, lateral thalamus, medial temporal structures, and parts of the globus pallidus and cerebral peduncle. [2] Consequently, infarction in its territory may produce significant neurological deficits.

The classical AChA syndrome comprises the triad of contralateral hemiplegia, hemisensory loss, and homonymous hemianopia. [3] However, the complete syndrome is relatively uncommon, and patients may present with incomplete syndromes or lacunar manifestations.

This clinical variability is partly explained by the extensive anatomical variations and collateral connections between the AChA and branches of the posterior cerebral artery, posterior choroidal artery, and posterior communicating artery. The perforating branches supplying the PLIC, however, have limited collateral support, making this region particularly vulnerable to ischemia. [3]

AChA infarction may be confused with middle cerebral artery (MCA), posterior cerebral artery (PCA), or watershed infarction because of the overlapping vascular territories. Previous literature has described both small-vessel and large-vessel mechanisms, with hypertension, diabetes mellitus, dyslipidaemia, large-artery atherosclerosis, and cardioembolism implicated in different clinical settings. [3, 4]

Despite its clinical importance, detailed clinical and radiological descriptions of AChA infarction remain relatively limited. Understanding its presenting features, vascular risk factors, etiological patterns, lesion distribution, and functional outcomes may improve diagnostic recognition and facilitate appropriate secondary prevention. This study aimed to describe the clinical spectrum, vascular risk factors, etiological subtypes, radiological characteristics, and three-month functional outcomes of patients with AChA infarction in an Asian population.

Methods

This was a cross-sectional case-series study conducted over 12 months, with functional outcomes assessed at three months. Twelve patients diagnosed with AChA territory infarction were included in the analysis. A structured proforma was used to collect demographic information, vascular risk factors, presenting clinical manifestations, neuroimaging findings, etiological classification, and functional outcomes. All patients underwent brain magnetic resonance imaging (MRI) and angiographic evaluation.

Imaging findings were reviewed to identify the distribution of infarction within the AChA territory, including involvement of superficial and deep branches and the PLIC.

Clinical manifestations were assessed to determine whether patients presented with the complete classical AChA syndrome or an incomplete clinical presentation. Stroke etiology was classified according to the Trial of ORG 10172 in Acute Stroke Treatment (TOAST) classification. Functional outcome was assessed at three months using the modified Rankin Scale (mRS). A mRS score of ≤2 was considered a good functional outcome. The study was descriptive in nature. Given the small sample size, findings are presented primarily as frequencies, percentages, and descriptive statistics.

Results

Demographic characteristics and vascular risk factors:

Twelve patients with AChA infarction were identified during the study period. Eight patients (66.7%) were male. The mean age was 45.6±12.65 years. Hypertension was the most frequently identified vascular risk factor, present in nine patients (75%). The demographic profile and predominance of hypertension highlight the importance of conventional vascular risk factors in this patient population.

Clinical spectrum

The complete classical AChA syndrome, characterised by hemiplegia, hemisensory loss, and homonymous hemianopia, was not the predominant presentation. Eight patients (66.7%) presented with incomplete clinical forms of AChA syndrome. These findings demonstrate the variability of clinical presentation and indicate that the absence of the complete classical triad does not exclude AChA territory infarction. Figure 1 shows schematic representation of risk factors, clinical and radiological patterns observed in these case series.

Stroke classification and radiological findings

Three patients (33.3%) were classified as having lacunar stroke, whereas eight patients (66.6%) had non-lacunar stroke. MRI demonstrated involvement of both superficial and deep branches of the AChA in seven patients (55.5%). The posterior limb of the internal capsule (PLIC) was involved in all twelve patients, making it the most consistent radiological finding in this series.

The predominance of non-lacunar presentations and the frequent involvement of multiple AChA branches indicate that infarction in this vascular territory may extend beyond the pattern traditionally associated with isolated small-vessel disease. Various pattern of involvement of AChA territory infarct observed in our case series are represented in the Figure 2.

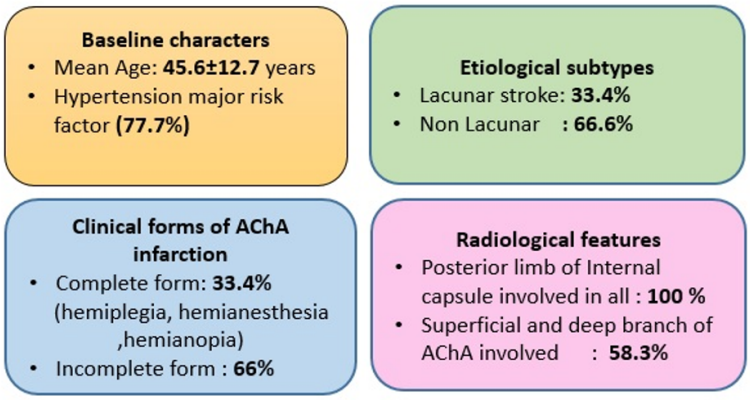


Figure 1. Schematic representation of risk factors, clinical and radiological patterns noted in the case series.

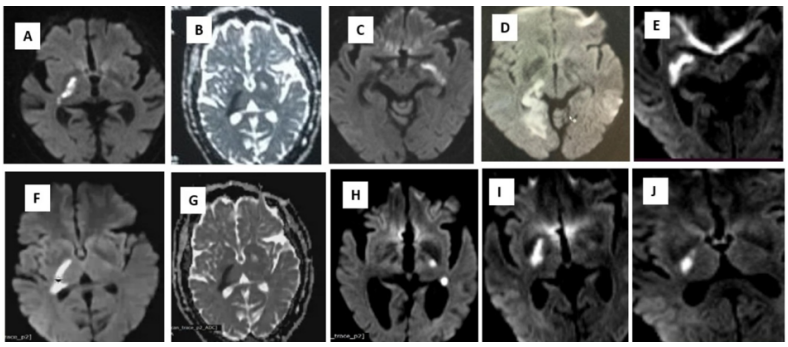


Figure 2. Figure showing patterns of acute infarct in anterior choroidal artery territory, involvement of right posterior limb of internal capsule (PLIC) diffusion restriction (A) and hypointensity in ADC (B); left hippocampal involvement (C); right medial occipital lobe and optic radiation (D);right hippocampal horn (E);Right PLIC and optic radiation DW restriction (F) and hypointensity on ADC (G);left partial PLIC and posterior horn (H);right lateral thalamus and PLIC (I) and lateral thalamus (J) respectively.

90 days functional outcome

At three months, ten patients (83.3%) had a good functional outcome, defined as mRS score of ≤2. Death occurred in one case.

Discussion

AChA stroke account for 2.9 % to 11 % of Ischemic stroke. [3] Present case series describes the clinical, vascular, and radiological characteristics of twelve patients with AChA infarction. Three findings are particularly noteworthy: the predominance of incomplete clinical syndromes, the higher proportion of non-lacunar strokes, and the consistent involvement of the PLIC.

The classical AChA syndrome is characterised by contralateral motor weakness, hemisensory loss, and homonymous hemianopia. Nevertheless, the complete triad is relatively uncommon in clinical practice. Collateral circulation and anatomical variability may preserve some portions of the AChA territory despite vascular occlusion.

Furthermore, the extent and location of infarction determine the clinical manifestations. The finding that two-thirds of patients in our series had incomplete syndromes supports the importance of maintaining clinical suspicion even when the classical triad is absent.

Hypertension was the most common vascular risk factor, which is similar to previous studies. [5, 6] . However, the identification of non-lacunar stroke in 66.6% of patients suggests that AChA infarction should not automatically be attributed to small-vessel occlusion. Large-artery disease and embolic mechanisms are recognised causes of AChA territory infarction, particularly when larger or more extensive areas are involved. Literature showed 83.3% of patients had lacunar stroke while 38.1% cases had large vessel disease. [7]

The PLIC was affected in every patient in this series. This finding has important anatomical and clinical implications. The PLIC contains densely packed corticospinal fibres, and infarction in this region may produce substantial contralateral weakness even in the absence of extensive cortical involvement. Its consistent involvement in our cohort suggests that careful assessment of the PLIC on diffusion-weighted MRI can provide a useful clue to AChA territory infarction. Similar findings are reported in literature. [8]

Majority of the patient did not have classical triad of AChA infarction. Incomplete forms were reported in our case series that is similar to existing literature. [7, 9]

The principal limitations are the small sample size, short recruitment period, and descriptive design. The results cannot establish causal relationships or be generalised to all patients with AChA infarction. Larger prospective studies with standardised neurological severity scores, detailed vascular imaging, and longitudinal follow-up are warranted.

Conclusion

AChA infarction presents with a variable clinical spectrum, and the complete classical triad of hemiplegia, hemisensory loss, and homonymous hemianopia is not consistently observed. Hypertension was the predominant vascular risk factor, non-lacunar strokes were more frequent than lacunar strokes, and the PLIC was involved in every patient in these case series. Isolated PLIC involvement is a radiological clue for AChA stroke.

Conflict of Interest

The author declares no competing interests.

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