Case Report

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Cardioembolic Stroke as an Initial Presentation of Carney's Complex: A Case Report

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Abstract

Carney Complex (CNC) is a hereditary lentiginosis syndrome caused by mutations in the PRKAR1A gene, leading to abnormalities in the cyclic AMP-dependent protein kinase (PKA) signalling pathway. This condition predisposes individuals to pigmented lesions, myxomas, and endocrine tumors. We present a case of a 28-year-old male diagnosed with CNC after experiencing a cardioembolic stroke due to a left ventricular myxoma. The diagnosis was suspected following a clinical examination that revealed small, well-demarcated, light brown skin lesions around the eyes and over the back. These characteristic skin findings, combined with the presence of cardiac myxomas, raised the suspicion of CNC. Although CNC typically presents with endocrine abnormalities, this case exemplifies a less common presentation. Our report emphasizes the importance of recognizing the diverse phenotypic spectrum of CNC and the need for awareness of this rare, often under diagnosed syndrome.

Keywords: Carney's Complex; CNC typically; Cardioembolic stroke; Ventricular myxoma; Cneoplasia syndrome.

INTRODUCTION

Carney Complex (CNC) is a rare multiple neoplasia syndrome primarily caused by mutations in the PRKAR1A gene, which encodes the regulatory subunit type I alpha of protein kinase A.[1] The PRKAR1A gene functions as a tumor suppressor, and over 120 different mutations have been identified throughout its coding region.[2] It is characterized by distinctive pigmented lesions on the skin and mucosal surfaces, as well as by cardiac and noncardiac myxomatous tumors and multiple endocrine tumors.[1] This syndrome is inherited in an autosomal dominant manner, though approximately 25 percent of cases arise sporadically due to de novo mutations.[2]

Cardioembolic stroke as the presentation of CNC is rarely described in the literature.[3] Here, we present a case where CNC was initially identified following the diagnosis of an embolic stroke secondary to left ventricle cardiac myxoma.

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CASE DESCRIPTION

A 28-year-old male presented with sudden onset right-sided weakness and aphasia upon waking, despite being asymptomatic the previous day. His medical history was unremarkable, but physical examination revealed small, light brown macules around the eyes and on the back (Fig. 1). Neurological evaluation confirmed right-sided hemiparesis and motor aphasia. A CT brain scan revealed a left middle cerebral artery (MCA) territory infarct (Fig. 2). Further investigation with a 2D echocardiogram showed a 3.7 x 2.5cm mass attached to the apex of the left ventricle (LV), identified on cardiac MRI as a probable intraluminal thrombus on the antero-septal wall (Fig. 3, 4). The coronary angiogram revealed a significant ostio-proximal lesion involving the left anterior descending artery (LAD) and its first diagonal branch, exhibiting an 80-90% stenosis with diffuse disease throughout the LAD (Fig. 5). Treatment included single-vessel coronary artery bypass grafting (LIMA to LAD) and excision of the LV myxoma (Fig. 6), with an uneventful post-operative course leading to discharge on day 6 and subsequent neurological rehabilitation. Histopathological examination confirmed cardiac myxoma characterized by spindle cells with eosinophilic cytoplasm and myxoid stroma (Fig. 7). Genetic testing identified Carney complex type I with a PRKAR1A gene deletion mutation. Follow-up echocardiograms at 6 months and 1 year showed no tumor recurrence.

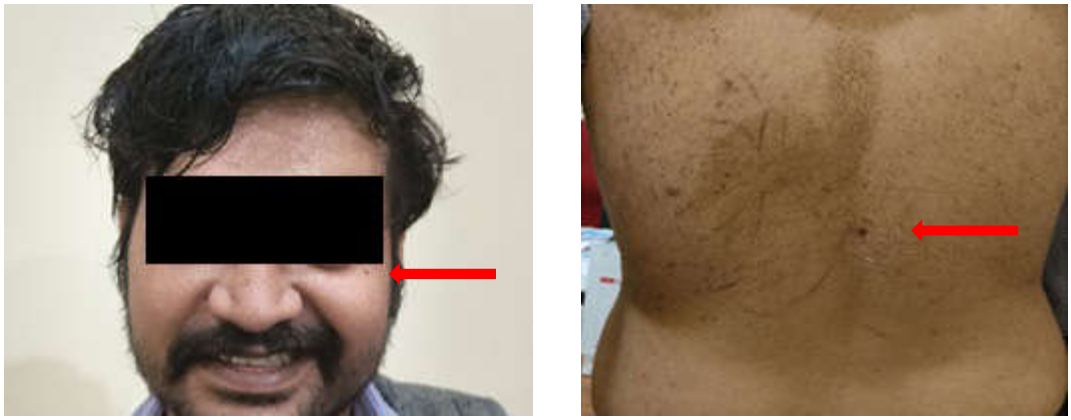

Fig. 1: Clinical photo – small well demarcated macules light brown in color over the back and around the eyes (red arrow)

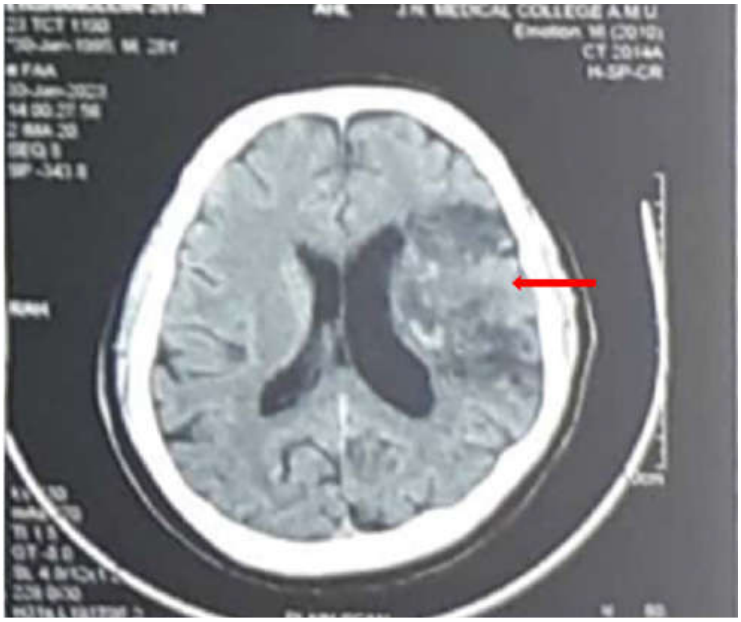

Fig. 2: CT Brain – Image suggestive of sub-acute infarct (red arrow) involving left fronto-parietal-temporal lobe with gyriform hyperdensities with CT value of blood noted within the infarct (hemorrhagic transformation)

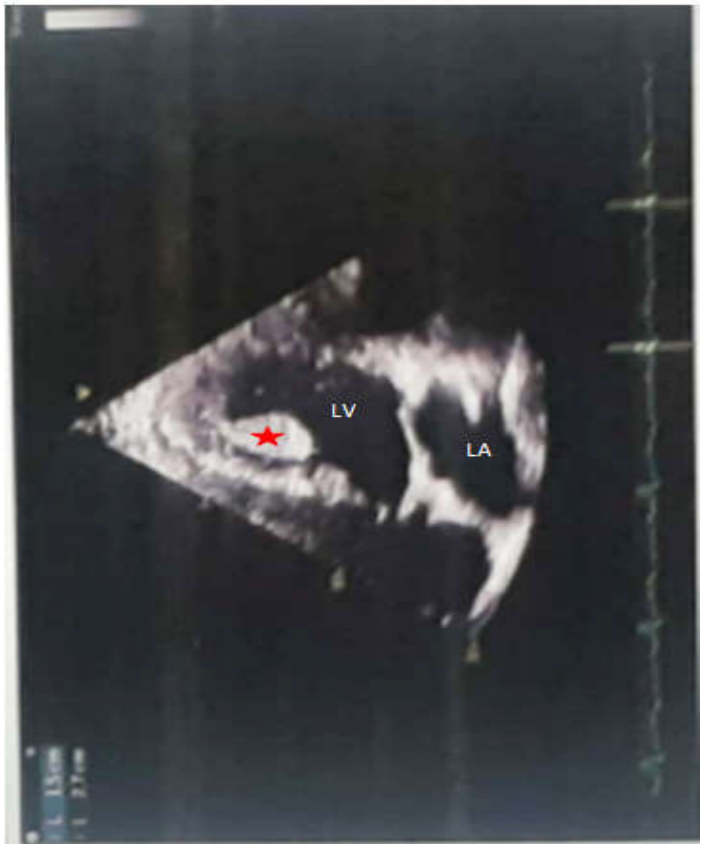

Fig. 3: ECHO – A mass of size 2.7 x 1.5 cm is seen attached to the LV apex with a stalk with a high embolic potential (red asterix). Regional wall motion abnormality present in the LAD territory. No chamber enlargement and all valves are within normal limits. LV – Left ventricle, LA – Left atrium

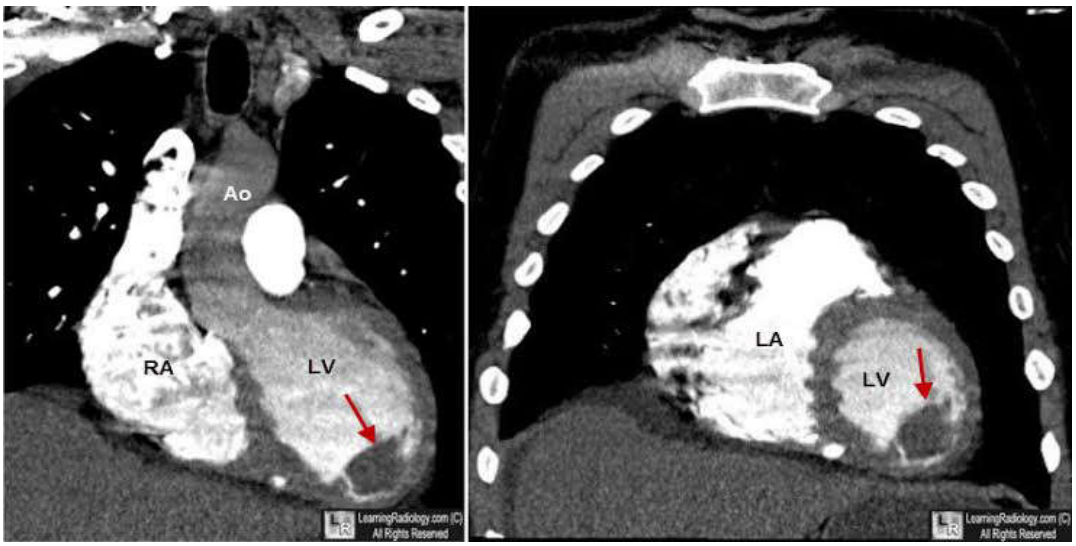

Fig. 4: MRI cardiac –A 3.2 x 2.5 cm pedunculated mass seen arising from the LV apex with with heterogenous signal enhancement in T1 and T2 sequences (red arrow) (***Source: https://learningradiology.com/notes/cardiacnotes/leftventthrombus.htm***)

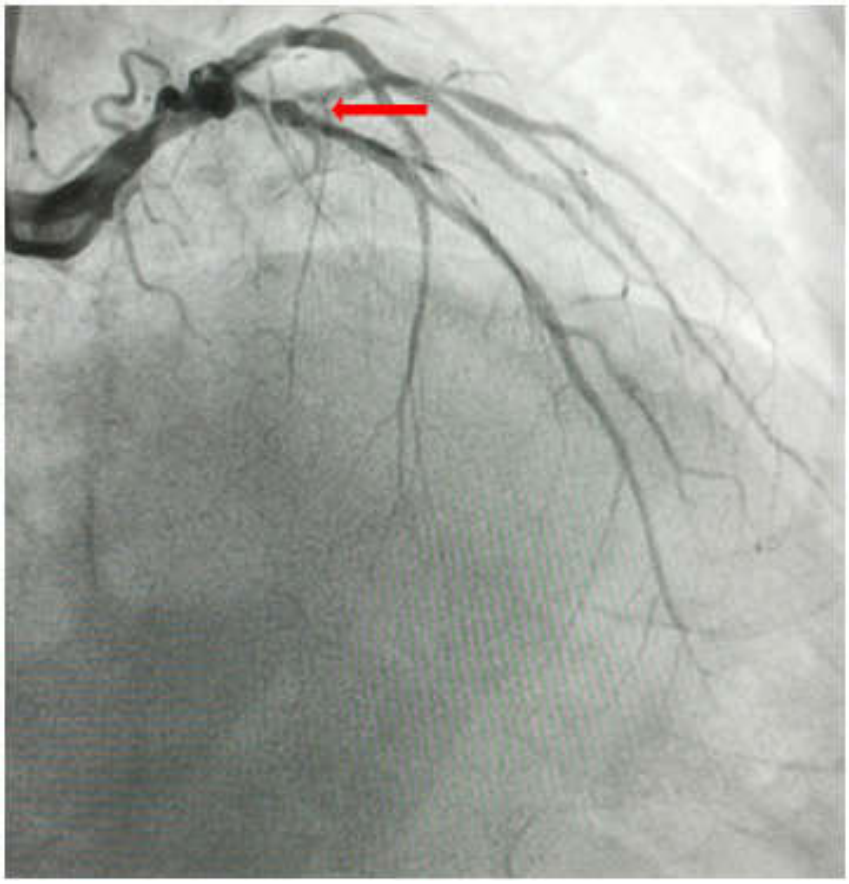

Fig. 5: CAG - A coronary angiogram showing an ostio-proximal lesion of LAD/D1 around 80-90% with diffusely diseased LAD (red arrow)

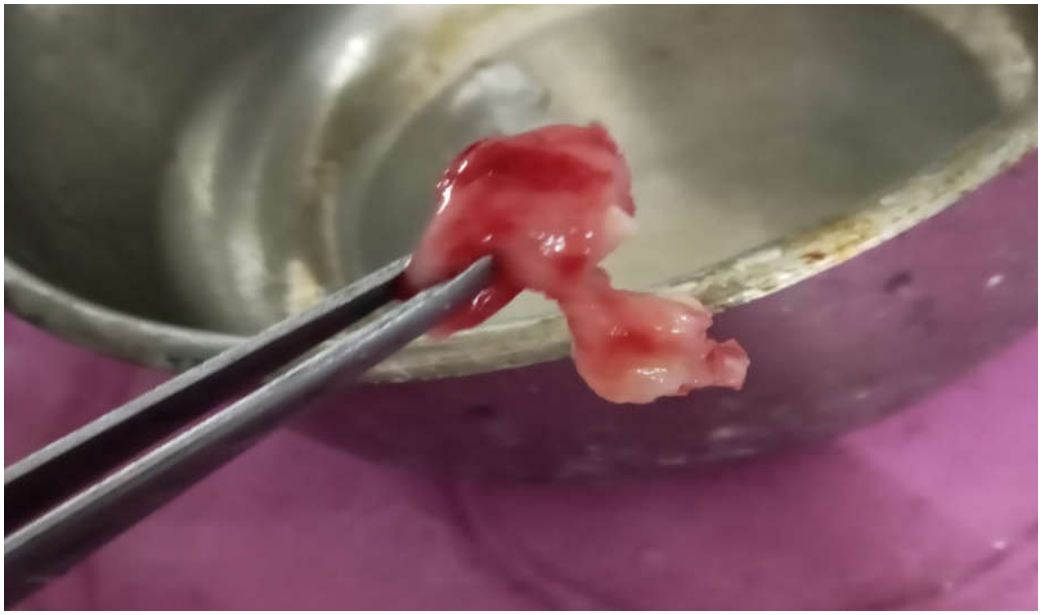

Fig. 6: Surgical specimen – A 3 x 2 cm fleshy reddish mass excised from the apex of the left ventricle.

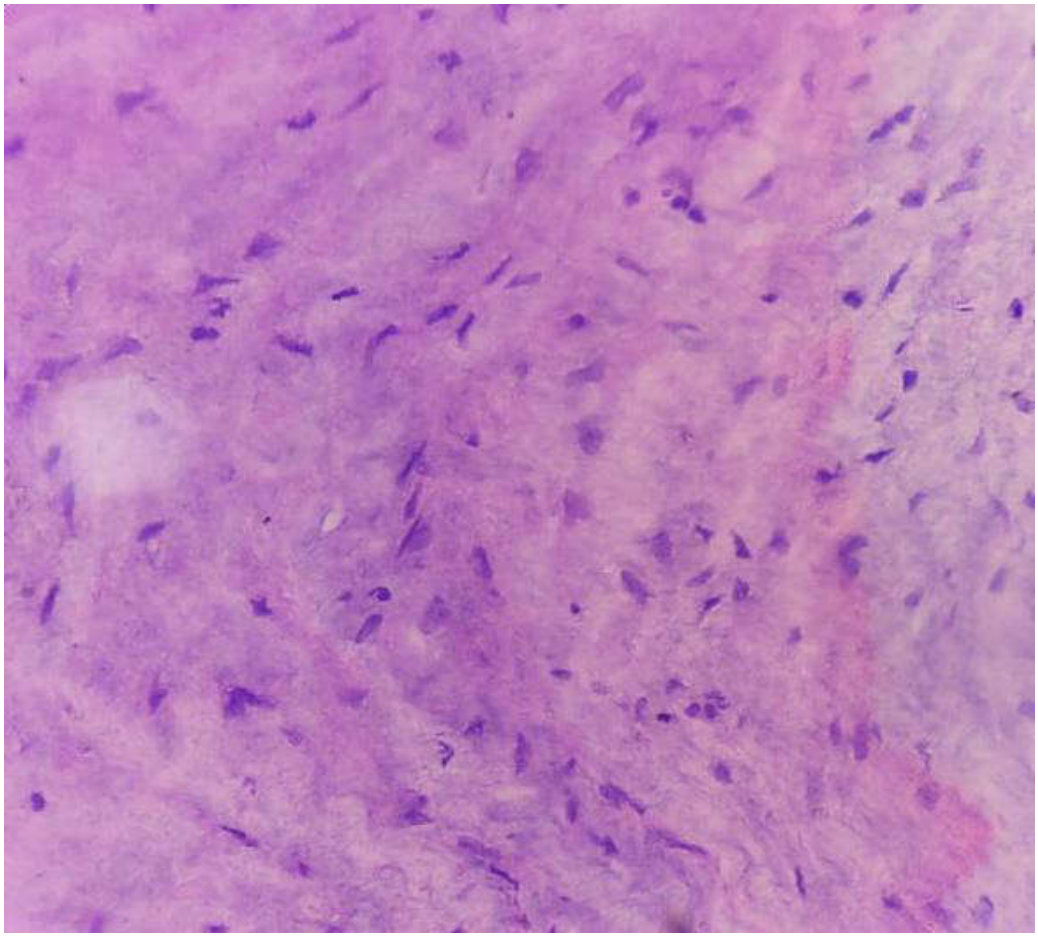

Fig. 7: HPE - H and E stained section shows stellate to spindle cells with eosinophilic cytoplasm with indistinct border within myxoid stroma.

DISCUSSION

Primary cardiac tumors are exceedingly rare, with an estimated incidence ranging from 0.001 to 0.3%.[2] Among these tumors, the majority are benign, with cardiac myxomas being the most prevalent.[4] Typically originating from the intra-atrial septum of the left atrium (75%), myxomas can also occur in the ventricles, albeit less frequently (5%).[4] Approximately 5% of cases are familial, often manifesting at a younger age.[4] Clinical presentation varies based on tumor location, size, mobility, and associated conditions, often leading to nonspecific symptoms and potential diagnostic delays.[4] Complications such as cerebrovascular accidents secondary to tumor embolism are common, as observed in our case. Diagnosis is typically made incidentally during evaluation for peripheral or central embolism, with trans-thoracic and trans-oesophageal echocardiography serving as the diagnostic modalities of choice.[5] In cases of diagnostic uncertainty, computed tomography or magnetic resonance imaging may be utilized.[6] Complete surgical resection under cardio-pulmonary bypass, with closure of residual defects, remains the cornerstone of treatment, with surgery generally associated with low morbidity and mortality. Long-term clinical and echocardiographic surveillance is imperative, particularly in familial cases, due to the risk of recurrence.

Cardiac myxomas in CNC occur at young age and exhibit a higher tendency for multicentric growth, potentially affecting any or all cardiac chambers.[7] If the patient has a cardiac myxoma, especially in a cardiac chamber other than the left atrium at a younger age, one should bear in mind the possibility of CNC. Additionally, CNC-related myxomas have a recurrence rate of approximately 44%, necessitating vigilant long-term monitoring and management strategies.[7] Cardiac myxomas

are known for their friability, predisposing to cardioembolic stroke. Nineteen cases of cerebral embolism attributed to cardiac myxoma and diagnosed with Carney Complex have been documented in the literature, with seven cases reported in a single series by Briassoulis et al.[8]

Following initial management of cardiac myxomas in Carney Complex (CNC), ongoing surveillance plays a critical role in detecting and managing potential complications and associated conditions.[2] Annual echocardiograms are recommended for both children and adults to monitor for recurrence or new myxoma development, with more frequent monitoring every six months advised for pediatric patients with a history of excised myxomas.[2] Additionally, comprehensive evaluation for associated endocrinopathies should be conducted, necessitating vigilant follow-up and prompt management.[2] Annual thyroid ultrasounds are essential for early detection of thyroid nodules across all age groups, while annual testicular ultrasounds are indicated in pre-pubertal boys, with follow-up by a urologist if nodules are identified.[2] Annual assessment of 24-hour urinary free cortisol (UFC) and insulin-like growth factor-1 are crucial for screening of cushing's syndrome and acromegaly.[2] In our patient, ultrasonography of the neck revealed no thyroid nodules, and measurements of 24-hour UFC and IGF-1 were within normal limits.Genetic counselling has been extended to all family members as part of the management for Carney Complex (CNC).

CONCLUSION

In conclusion, this case underscores the rare presentation of Carney Complex (CNC) involving a left ventricular cardiac myxoma that led to a cardioembolic stroke in a young adult. Recognizing CNC early is vital due to its potential for affecting multiple organ systems, including the cardiovascular and endocrine systems. A multidisciplinary approach involving neurologist, endocrinologist, cardiologist, and cardiothoracic surgeons is crucial for the accurate diagnosis and successful management of the patient.

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