Chiari Network in Right Atrium of Heart

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ABSTRACT

Introduction: Chiari network is an embryonic remnant of right valve of sinus venosus due to its incomplete resorption. It is a fenestrated net-like membranous structure mostly seen in the right atrium near the opening of Inferior vena cava and Coronary sinus. It is rare, often diagnosed incidentally and is usually of no clinical significance. However, there are reports of its association with atrial fibrillation, arrhythmias, right atrial thrombus entanglement, paradoxical embolism and catheter entrapment during percutaneous interventions. Here we present a case of Chiari network in a 45 years old female diagnosed by two dimensional trans-thoracic echocardiography (2D-TTE). Our aim is to highlight clinical significance of this rare but possible congenital cardiac remnant which is often silent.

Keywords: chiari network; congenital remnant; echocardiography

INTRODUCTION

Chiari network, which is an embryonic remnant in the right atrium is mostly characterized by reticular network of fine strands that lies close to the inferior venacava and coronary sinus sometimes connecting these with other right atrial structures.[1] Embryonically the right horn of the sinus venosus incorporates into the wall of the right atrium and the valve of this venosus will then regress between 9-15th week of gestation. Chiari network appears when there is failure of resorption of the right sided sinus venosus valve.[2]

Its incidence in autopsy specimens is about 2-3% and it was described for the first time by an Austrian pathologist Hans Chiari in 1897.[3] The purpose of this case report is to make aware of the clinical conditions associated with this rare and often benign finding.

CASE REPORT

A 45 year old female was a newly diagnosed case of essential hypertension. She was asymptomatic clinically without any significant past history. On 2D-TTE a freely mobile serpentine highly reflective structure measuring around 3.7 cm longitudinally with corresponding area of 3.26 cm^2 was observed in the right atrium (Fig 1 and 2). The structure showed characteristically whip-like movements with each cardiac cycle and was confined near inferior venacava (IVC) and interatrial septum (IAS) - features consistent with Chiari network. Other echocardiographic parameters like chambers and valves were normal with normal flow pattern and systolic and diastolic functions also appeared normal. It

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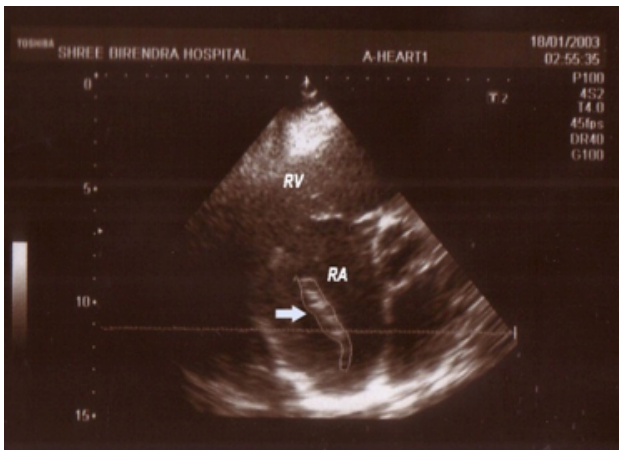

Figure 1: Parasternal short-axis view at the level of the aortic valve-Chiari network in cardiac diastole. (RA = right atrium; RV = right ventricle).

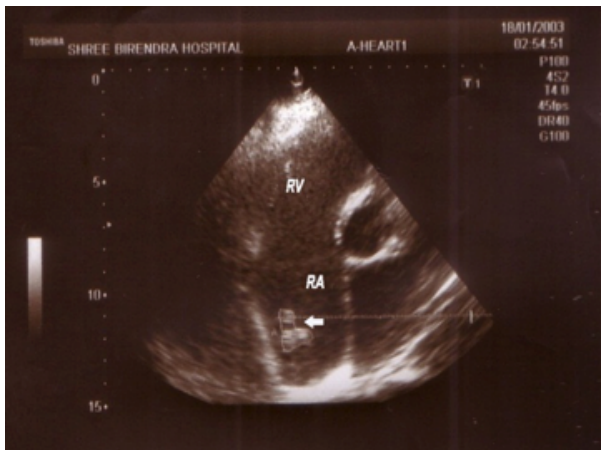

Figure 2: Parasternal short-axis view at the level of the aortic valve - Chiari network in cardiac systole. (RA= right atrium; RV= right ventricle).

was an incidental finding and the lesion was silent.

DISCUSSION

In TTE and transesophageal echocardiography (TEE) Chiari network presents as a highly mobile and reflectant serpentine echo target in several locations of right atrium. In order to make definite diagnosis and differentiate from other structures real time three dimensional TTE (3D-TTE) and cardiac magnetic resonance imaging (MRI) are complimentary[2,4]

The Chiari network is mostly benign without any clinical significance but it has high association with patent foramen ovale (PFO) and atrio-septal aneurysm (ASA) facilitating paradoxical embolism (embolic stroke).[2,5] It has to be differentiated from other right atrial normal structures like Eustachian and Thebesian valves and abnormalities such as right atrial thrombi, tumors, vegetations, cor triatriatum dexter, Ebstein anomaly of the tricuspid valve or tricuspid-chordal rupture.[6] There are reports of its association with atrial fibrillation, supraventricular arrhythmias, tricuspid regurgitation and infective endocarditis.[2,7] Besides there are possibilities that catheters, guidewires and pacemaker leads may get entrapped within the net during invasive procedures.[8,9] Still in debate, chiari network may have a protective role in preventing embolization by holding thrombus in the network in some patients with Thrombophilia.[10]

CONCLUSIONS

Chiari network is a rare congenital embryonic remnant of the right valve of the sinus venosus. Though considered mostly benign and clinically insignificant there are literatures to support its involvement in the pathogenesis of thromboembolic disease (Pulmonary embolism, Stroke), arrhythmias (Atrial fibrillation, Wolf-Parkinson-White syndrome) and endocarditis. Besides it can be a cause of procedural difficulties because of catheter entrapment during percutaneous interventions. Hence clinicians should bear in mind about this rare but possible clinical condition and further evaluation and treatment to be individualized.

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