

# A case of Chiari network and paradoxical emboli

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## Abstract

Chiari network is an anatomic variant that is present in minority of population and usually is described clinically non-significant. Many of patients with chiari network have patent foramen ovale (PFO). We present a case of young women with chiari network, patent foramen ovale, and cerebrovascular accident due to paradoxical emboli.

## Introduction

Chiari network is a normal variant anatomic structure that is possible to be derived from sinus venous [1]. It is a mobile, thin, web-like structure that may be seen in 2% of echocardiographs [2]. This structure is benign, but in many cases a simultaneous patent foramen ovale and right to left shunting is there [3]. In most articles there is no pathological role for Chiari network, but some studies have linked Chiari network with various complications [4]. Presence of the Chiari network and patent foramen ovale may enhance the formation of an atrial septal aneurysm and facilitate paradoxical embolism [3,5]. The role of Chiari network in thrombosis formation is not well defined.

## Case report

A 38 years age old women with a history of three months ago ischemic cerebrovascular accident was referred to the cardiac clinic. In physical examination patient had right side paresthesia. Echocardiography was performed due to the lack of risk factors for thrombosis. Transthoracic echocardiography revealed a large PFO and Chiari network, requiring surgery. Other structures were normal and heart function was acceptable. The electrocardiography showed a sinus rhythm. Patient doesn't have the history of atrial fibrillation and coagulation disorders, deep vein thrombosis or pulmonary emboli. Surgery was done using the cardiopulmonary bypass. The right atrium was incised and PFO was evaluated. The defect was repaired using a simple whip stitch of continuous prolane.

## Discussion

Chiari network has been reported in 2-3% of population [2]. It has no clinical significance and does not cause any clinical symptom. It usually is diagnosed incidentally [6,7]. Despite the fact that in itself is not important, but its presence is associated with a great range of symptoms. Several disturbances such as PFO, paradoxical emboli, clot formation, infective endocarditis, heart failure, and supraventricular arrhythmia are reported [5,8-11]. Also preventing from right atrium catheter implantation, pace wire lead insertion and CPB cannulation are related to Chiari network [12-14]. In thrombophilia it acts such as inferior vena cava filter and prevents emboli [15].

In recent years, using the three-dimensional echocardiography it is more likely to distinguish it from other disorders [16]. Disorders such

as right atrium thrombosis, tumour and vegetation cause diagnostic confusion [7,17]. In this patient, the wrong diagnosis was performed using echocardiography twice as a thrombosis.

Simultaneous PFO is reported in more than 80% of patients [11]. In the presence of PFO the risk of paradoxical emboli and ischemic stroke is increased [18]. Of course, PFO without the presence of Chiari network is a risk factor for embolism. So, we do not know what percentage of the risk is related to the simultaneous presence of Chiari network. In some studies, has been said that Chiari network can be a source of clot formation. Also, some studies report cases of patients suffering a paradoxical embolism without patent foramen ovale [19].

The detailed indications for Chiari network surgery are not clear. Chiari network usually does not require independent surgery, but if a patient is undergoing cardiac surgery for other reasons the Chiari network will be removed [11]. In patients suspected of having paradox emboli indications for surgery is not specified.

In conclusion, Chiari network as a common finding should be considered in the differential diagnosis. Although the paradoxical embolism following Chiari network is uncommon, the characteristics of the Chiari network described here might explain the pathophysiology of a paradoxical embolism [4]. Also, how to deal with Chiari network is controversial. Chiari network by itself is not pathological findings, but the complications associated with it can be challenging.

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