**Echocardiographic Diagnosis of Divided Right Atrium—Cor Triatriatum Dextrum**

Ramush Bejiqi, Ragip Retkoceri, Hana Bejiqi, Naim Zeka, Myrvete Kelmendi  
Pediatric Clinic, University Clinical Centre of Kosova, Prishtina, Kosova

First reported in 1868, cor triatriatum, that is, a heart with 3 atria (triatrial heart), is a congenital anomaly in which the left atrium (cor triatriatum sinistrum) or right atrium (cor triatriatum dextrum) is divided into two parts by a fold of tissue, a membrane, or a fibromuscular band. As far as division of the morphologically left atrium (cor triatriatum) is a recognized clinical and surgical entity. Division of the right atrium (prominence of the eustachian and thebesian valves) is recognized pathologically, but is rare. A partition division the right atrium was attached to the orifice of the inferior caval vein. The dividing partition is placed between the systemic venous sinus and the distal part of the right atrium, made up of the vestibule and appendage. This report describes a case of a divided right atrium, associated with a large atrial septal defect and valvular pulmonary stenosis. **Key words:** Eustachian valve, atrial septal defect, cor triatriatum dextrum, cross-sectional echocardiography.

**1. INTRODUCTION**  
A 5 year old girl, weight 12.2 kg (<5 percentile) presented at our institution with a history of often respiratory infection, clinically manifested central cyanosis, hypotrophy and anemia. There were now clinical signs of any syndrome. Pulses were equal and full in all extremities. Oxygen saturation, measured by pulse oxymetry, was 89%. Clinical examination revealed normal rhythm, a normal first heart sound; an ejection systolic murmur upper left sternal border and the second sound was split. chest radiograph revealed cardiomegaly. The main PA segment is prominent with normal mediastinum and increased pulmonary vasculature.

The electrocardiogram showed normal sinus rhythm, with normal intervals and right axis deviation, and incomplete block of right bundle branch.

Cross sectional echocardiography revealed normal situs and normal pulmonary venous return. Both systemic veins are dilated and drains in apical part of right atrium, which is separating from distal part, with membrane (Figure 1). The main flow from systemic veins goes to left atrium through the large interatrial defect, diameter 23 mm (Figure 2). Separating membrane has a few small defects, contributing restrictive flow between apical and distal-tricuspid part of right atrium. The mean pressure gradient between the two atrial components, estimated by pulse wave Doppler, was 28 mmHg. There was normal atrioventricular and ventriculo-arterial connection. Color Doppler showed normal anterograd atrioventricular flow and trivial tricuspid regurgitation. Pulmonary valve were presented more hyperechogenic, diameter 15mm, causing turbulent anterograd flow (Figure 3). The mean pressure gradient in pulmonary valve level, measured by continuous wave Doppler, was 33 mmHg. The mean of pulmonary artery is dilated, diameter 28mm; pulmonary branches are normal.

**2. DISCUSSION**  
Division of the right atrium, also known as cor triatriatum dexters, is extremely a rare congenital abnormality, in which persistence of the right valve of the embryonic systemic venous sinus divides the right atrium into two chambers (1,2,3). It may be associated with other congenital malformation, such as pulmonary stenosis or atresia, tricuspid atresia and hypoplastic right ventricle. Clinical symptoms are highly variable,
serves to direct the oxygenated venous return from the inferior vena cava across the foramen ovale to the left side of the heart during fetal life. Unlike cor triatriatum sinister, which carries a high mortality rate if not repaired (3), cor triatriatum dexter has varying clinical manifestations, depending on the degree of partitioning or septation of the right atrium.

Cor triatriatum dextrum can be diagnosed at any age, especially if incidentally discovered. Other congenital cardiac defects, such as atrial septal defect, may be present and demand evaluation. Cor triatriatum can also be misdiagnosed as other common cardiac conditions such as constrictive pericarditis. With only a minor degree of septation of the right atrium, cor triatriatum dexter often is asymptomatic and is detected only incidentally, for example, during surgery to correct other cardiac abnormalities or during echocardiography. In our case, persistence of a large obstructive, membrane dividing the right atrium with small defects caused restrictive flow between “two right atrial parts” and elevated central venous pressures secondary to obstruction of the tricuspid valve, the right ventricular outflow tract, or the inferior vena cava. Associated cardiac defects, such as ASD, have been described (2). In our case a large ASD caused big right-left shunt and overloading left heart side. Pulmonary valvular stenosis contributes in increasing right ventricular pressure and relatively normal right ventricle dimensions.

3. PROGNOSIS

In the past, the mainstay of treatment for symptomatic patients has been surgical resection of the dividing membrane. However, percutaneous catheter disruption of the membrane has been reported and has been suggested as a preferred alternative to open heart surgery (3). Asymptomatic patients are generally not treated unless they are undergoing cardiac surgery for other reasons. Since many patients are asymptomatic, the diagnosis of cor triatriatum dexter often is determined at postmortem examination. Antemortem diagnosis can be determined by using angiography, echocardiography, or MR imaging. There have been numerous reports about the use of echocardiography to determine the diagnosis noninvasively that mainly date from the mid-1980s to early 1990s (1,5). Our patient had a history of shortness of breath and peripheral edema at presentation. Findings at echocardiography suggested an ASD and pulmonary stenosis and indicated the presence of a membrane in the right atrium. Despite late diagnosis and presence of clinical consequences (central cyanosis, hypotrophia and anemia) child was planned for surgical correction of anomaly. In absence of cardio surgical service in Kosovo, founded from humanitarian organization, child has been evacuated in Lausanne, Switzerland, where he was successfully operated.

REFERENCES