A newborn with Aortico-left Ventricular Tunnel mimicking Sinus of Valsalva Aneurysm

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Abstract

Aortico-left ventricular tunnel (ALVT) is a rare congenital cardiac anomaly and constitues of less than 0.1% of all congenital cardiac defects (1). ALVT is described as an abnormal connection between the ascending aorta and the left ventricul which originates commonly above the right sinus of valsalva. Most patients are diagnosed with an ALVT during early infancy (2). Although transthoracic echocardiography (TTE) is more effective in diagnosis of ALVT, misdiagnosis rate was 17.1% (3). Sinus of valsalva aneurysm (SVA) is frequently confused with ALVT (3). We report a term female newborn with SVA in echocardiographic examination but in surgery she was diagnosed with ALVT.

Title

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Abstract

Aortico-left ventricular tunnel (ALVT) is a rare congenital cardiac anomaly and constitues of less than 0.1% of all congenital cardiac defects (1). ALVT is described as an abnormal connection between the ascending aorta and the left ventricul which originates commonly above the right sinus of valsalva. Most patients are diagnosed with an ALVT during early infancy (2). Although transthoracic echocardiography (TTE) is more effective in diagnosis of ALVT, misdiagnosis rate was 17.1% (3). Sinus of valsalva aneurysm (SVA) is frequently confused with ALVT (3). We report a term female newborn with SVA in echocardiographic examination but in surgery she was diagnosed with ALVT.

Case

A two day-old term female baby was admitted our unit due to history of ventriculer septal defect (VSD) determined in fetal echocardiography at the 32. gestational week. She had no complaints and her physical examination was normal after birth except 3/6 sistolodiastolic murmur along the left sternal border. In transthoracic echocardiography (TTE), we detected a giant aneurysm located anterior of the aortic ring with a diameter of 11,5x12,7 mm and a small secundum atrial septal defect. Parasternal long axis and five-chambers views showed that the aneurysmatic sac was related with aorta and left ventricul (Figure-1A, B). In diastol period of cardiac cycle, there were two shunt flows, one was seen through the aortic root into the aneurysmatic sac (velocity:3,4 m/sn) and at the same time shunt flow from aneurysmatic sac to the left ventricule (velocity:2,3 m/sn) (Figure-2, Video-1). At subcostal examination, color flow doppler echocardiography showed the entrance of the aneurysm to left ventricule. The aneurysm also occupied the right ventricular outflow tract and caused mild obstruction (Video-2). Computed tomography showed the giant extracardiac aneurysmatic sac between aortic root and trunchus pulmonalis and a suspicion of SVA (Figure-3). The patient has been referred to the another cardiac center for surgery. The surgery was confirmed the diagnosis of ALVT.

Differential diagnosis of ALVT included SVA, VSD with aortic malformations, aortic valve insufficiency, four-leafleat aortic valve, aortic valve prolapse, infective endocarditis. It is difficult to differentiate SVA from ALVT. SVA usually orginates from below the level of sinotubuler junction of aorta and forms as a pocket pouch or petals. During the diastole period, increased arterial blood volume in the left ventricle expands the diameter of sinüs (2). ALVT is often orginates from the tubuler aorta, above the coronary artery ostiums rather than aortic valve sinüs (2). Hovaguimian et al.(4) defined an anatomic classification of aorto-ventricular tunnels; Type 1: Slit-like opening at the aortic end with no valve distortion, Type 2: Large extracardiac aneurysm, Type 3: Intracardiac aneurysm of the septal portion of the tunnel, with or without right ventricular outflow tract obstruction,Type 4: Combination of Types 2 and 3. Our case was compatible with type 4.

Although TTE is gold standart for definition of SVA and ALVT, the discrimination of these two antities can be difficult in some cases. In our case, also CT couldn't help differential diagnosis and certain diagnosis was determined by surgery.

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