Holt-Oram syndrome, bicuspid aortic valve, and patent ductus arteriosus

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Holt-Oram syndrome (HOS) is an autosomal dominant disorder (mutation in *TBX5* gene) with the European prevalence of 0.7 per 100 000 births [1]. It is characterized by congenital heart defects (CHD) and upper limb abnormalities. Heart defects most commonly include septal defects, followed by aortic coarctation (CoA), mitral valve defects, patent ductus arteriosus (PDA), and conduction disturbances [2]. Defects of the upper limb include thumb anomalies (absent or hypoplastic, triphalangeal, or syndactyly), agenesis/hypoplasia of radius, ulna, or humerus [1]. Moreover, hypoplasia of clavicles and thorax anomalies may also be present [3]. Next, the bicuspid aortic valve (BAV) is the most common CHD (prevalence 0.5%–2% and the entity is associated with valve stenosis or regurgitation, as well as dilatation, aneurysm, and dissection of the ascending aorta (AA). The coexistence of HOS and BAV was most probably described only once. The reported patient presented with multiple cardiac defects (atrial septal defect, BAV, and non-compaction of the left ventricle) [4]. Moreover, only single descriptions (7 reports) of coexistence HOS and PDA have been reported so far (2 and others). We report a HOS patient in whom BAV was diagnosed along with PDA.

Three HOS patients were identified among 103 330 patients (prevalence 0.003%) hospitalized at our institution from January 2008 to November 2020. One of them presented with BAV. A twenty-eight-year-old male HOS patient after surgical treatment of the aortic coarctation (CoA) and PDA ligation at the age of 7 was admitted for the assessment of the AA. Both transthoracic echocardiography and computed tomography angiography done in 2012 showed the dilated AA up to 51 mm and BAV with a fusion of the right and left coronary cusps (Figure 1). The patient was offered a redo corrective surgery. However, he preferred a conservative approach and remained under control elsewhere. Repeated transthoracic echocardiography after 9 years (July 2021) showed the AA dilated up to 52 mm. Again, he preferred further observation.

Both CoA and PDA were present in our patient in his childhood. These 2 heart anomalies are characteristic of HOS. Aortic aneurysm, however, is much more characteristic for BAV, and no association of HOS with AA aneurysm was previously reported. The type of BAV in our patient is the most common. Indication for surgical correction of the dilated AA among BAV-population has been described in detail elsewhere. Redo intervention on the AA (and possibly BAV replacement) after previous surgery may increase the peri-procedural risk (EuroSCORE II 2.88). Nonetheless, systematic assessment of the dilated AA is recommended every 6–12 months [5]. Finally, a more than casuistic coexistence of HOS and BAV may not be proven nor excluded in this case.

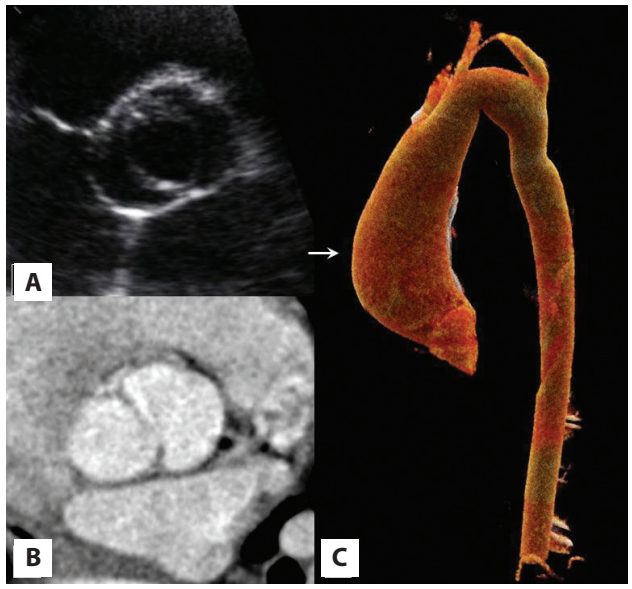

Figure 1. A. and **B.** Bicuspid aortic valve with commissure fusion between coronary cusps. Corresponding images from echocardiography and computed tomography, respectively. **C.** Computed tomography angiography. The white arrow indicates a dilated segment of the ascending aorta

Article information

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