Assessment of Arterial Stiffness Influence on Aortic Root Dilation in Children with Repaired Tetralogy of Fallot

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Aortic root dilatation is a known feature in tetralogy of Fallot (TOF). Progressive aortic root dilatation has been reported in some cases with tetralogy of Fallot even after reparative surgery. Aortic root dilatation was thought to be due to increased aortic flow resulted from right to left shunting and dextraposition. Besides, intrinsic histological abnormalities of the aortic wall that present since from infancy are important causative factors leading to aortic root dilatation. This study was conducted to explore relation of arterial stiffness with aortic root dilation in cases with repaired tetralogy of Fallot.

The study population consisted of 50 cases with repaired TOF and 27 age-matched healthy control children. The cases with repaired tetralogy of Fallot were divided into two groups as with and without dilated aortic root (group 1 and 2, respectively). Aortic strain was lower in group 1 than group 2 and controls (p=0.004, p<0.001), aortic distensibility was lower in group 1 than controls (p=0.016), and beta stiffness index was higher (p=0.016). Aortic distensibility was lower and beta stiffness index was higher in group 1 compared with group 2, although statistically insignificant (p=0.06, p=0.06). These results suggested that aortic strain which indicates elasticity of the aorta may be affected earlier than the distensibility and beta stiffness index.

Arterial stiffness may contribute to progressive dilation of aortic root in patients with repaired TOF. A better understanding of the pathophysiology will help to treatment strategies in TOF which patient with aortic dilation.