

**A frequent anomalous morphological pattern of the coronary sinus in corrected transposition of the great arteries: Implications for cardiac resynchronization therapy**

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**Introduction:** Patients with corrected transposition of the great arteries (CTGA) usually present with complete atrioventricular (AV) block and cardiac failure in the late evolution, occasionally requiring resynchronization therapy. We sought to evaluate the anatomy of the coronary sinus in hearts with CTGA in order to provide morphological guidance to the electrophysiologist to pace the left-sided systemic right ventricle.

**Methods:** A total of 16 hearts from our anatomical collection were analyzed: 8 controls from patients who died of other causes and 8 with CTGA. Mean ages were respectively 61.1 and 15.8 years. The coronary sinus (CS), the oblique vein of the left atrium and the great cardiac vein were dissected and the course of the CS in the left AV groove inspected. The linear distance between the ostium of the CS and the point of drainage of the left atrial oblique vein was measured and normalized by the largest internal diameter of the right AV valve (morphologically tricuspid in control hearts and mitral in corrected transposition).

**Results:** Five of the 8 hearts (62.5%) with CTGA showed the coronary sinus deviated from its normal course in the AV groove and ascending obliquely on the surface of the posterior wall of the left atrium to meet the oblique vein. The maximal deviation distance coincided in all hearts with the point where the left oblique vein (or the persistent left superior vena cava in one heart) reached the coronary sinus. This deviation distance, normalized by the largest diameter of the right AV valve ranged from 0.5 to 0.7. The linear measurement of the ascending portion of the CS in TCGA hearts correlated positively with the largest diameter of the morphologically tricuspid valve ( $R^2=0.88$ ,  $p=0.02$ ). Compared to the controls, in the hearts with CTGA the left oblique vein reached the CS significantly closer to its ostium in the right atrium ( $p<0.001$ ).

**Conclusion:** The distorted course of the CS and morphology of the left atrial oblique vein in CTGA may impose limitations during CS cannulation and should be taken into account when electrophysiological procedures are considered in this group of patients.