Coronary Sinus Morphology in Patients with Supraventricular Arrhythmias

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Introduction. In previous studies, some hypotheses about coronary sinus (CS) morphological changes depending on the type of supraventricular arrhythmias have been raised without any concluding remarks. The objective of this study was to evaluate if arrhythmias sustained by drivers close to the CS affect its size and morphology.

Methods. One hundred and forty-five consecutive patients affected by different types of arrhythmias have been enrolled in the study (48 with atrio-ventricular nodal re-entrant tachycardia, AVNRT; 63 with atrial fibrillation, AF; 27 with atrial flutter, FL; 7 with atrial ectopic tachycardia, AET). All patients underwent radiofrequency ablation using the CARTO® system (Biosense Webster). Descriptive (age, sex, BMI) and clinical (previous ablations, CS size, right atrium diameter and volume, Koch triangle area, distance between the AV node and the slow conduction path) parameters, for a total of 35 indices, were collected. T-test was applied to check differences between groups.

Results. Compared to the CS size in normal subjects reported in literature, supraventricular arrhythmias seem to dilate its ostium (221±65 mm²). Apart from expected results on patients’ age, procedure and fluoroscopy time, the volume of the right atrium (RA) was significantly higher in AF (159±41 cc) and FL (145±31 cc) compared to AVNRT (98±25 cc) patients. Importantly, the ratio between the area of the CS and the volume of the RA, also after BMI normalization, was significantly higher in AVNRT patients (AVNRT; 66.3±25.4 kg/m³, AF: 40.5±16.1 kg/m³, FL: 41.5±13.4 kg/m³ and AET: 43.8±15.9 kg/m³).

Conclusions. The macroscopic nature of the arrhythmias considered in this study irrevocably dilates the RA, in contrast to a problem that instead involves a micro-reentry at the nodal level. Obviously, these results need to be confirmed on a larger population from which a new index to predict the type of arrhythmia might be proposed.