Syncope and Bradycardia - Treatment

Radiofrequency catheter denervation of sinus node: a randomized comparison of right and left atrial approach for the cardioneuroablation

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Background: Radiofrequency catheter ablation of superior paraseptal ganglionic plexus is an important step to eliminate the vagal modulation of sinus node for the treatment of neurally-mediated syncope. The reasonable effect can be achieved by targeting this plexus from the endocardial aspect of both right (RA) and left (LA) atria.

Purpose: We investigated the efficacy of RA and LA ablation in terms of sinus nodal denervation.

Methods: The study included 24 patients (age: 42 ± 13 years, 50% males) who underwent cardioneuroablation for recurrent cardioinhibitory syncope in general anesthesia. Right atrial semicircular lesion at the posteroseptal quadrant of superior vena cava ostium was composed of 5-6 equidistantly distributed ablation sites (30 W, 30 s, 20 ml/min). Left atrial lesion of comparable size was placed strictly contralaterally across the interatrial septum in the anterior vestibulum of a right superior pulmonary vein. Patients were randomly (1:1) assigned to RA-to-LA or LA-to-RA ablation. Sinus rate and the response to extracardiac right vagal nerve high-frequency stimulation (50 Hz, 0.05 ms, 1 V/kg [<70V], 5 s) were recorded at baseline and after each ablation cluster.

Results: Study protocol ablations overall resulted in sinus acceleration (81 ± 13 vs. 59 ± 12 bpm, P <0.0001) and attenuation of inducible sinus arrests (maximum pause: 1.2 ± 1.4 vs. 5.5 ± 3.0 s, P <0.0001). Temporal development of outcome measures with the progression of ablation is shown in the Figure. There was no significant difference between study groups. Irrespective of ablation order, the first ablation cluster on average generated 77% of the final effect on sinus rate and 68% of the final effect on suppression of vagally-induced sinus pauses.

Conclusions: Neither RA nor LA approach is preferable for targeting the superior paraseptal ganglionic plexus. Both ablation clusters convey complementary and, in part, mutually independent effects. Biatrial cardioneuroablation seems essential for efficacious sinus nodal denervation.

Abstract Figure.