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EFFECT OF SITE-SPECIFIC PACING IN SYMPTOMATIC PATIENTS WITH NON-OBSTRUCTIVE HYPERTROPHIC CARDIOMYOPATHY

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Background: Treatment options for symptomatic patients with non-obstructive hypertrophic cardiomyopathy are limited.

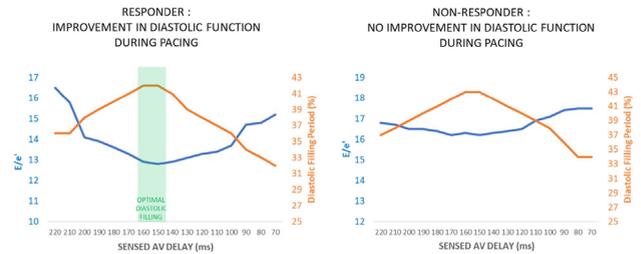
Objective: We studied the effect of dual chamber pacing at different ventricular sites on the diastolic function and functional capacity in patients with nHCM.

Methods: Nineteen patients with symptomatic nHCM and normal LV systolic function were prospectively enrolled. Inclusion criteria included an $E/e' \geq 15$ and an indication for ICD implantation. A Doppler echocardiographic study was performed during sinus rhythm and atrial synchronous ventricular pacing at various atrioventricular (AV) intervals. Pacing was performed at three right ventricular sites: RV apex (RVA), RV mid-septum (RVS), and RV outflow tract (RVO). The site and sensed AV delay (SAD) at which optimal diastolic filling occurred was chosen based on diastolic filling period and E/e' . During ICD implantation, the RV lead was implanted at the site selected by the pacing study. Devices were programmed in DDD mode at the optimal SAD. During follow up, diastolic function and functional capacity (NYHA Class, 6 Minute Walk Distance (6MWD)) were assessed.

Results: Among the 19 patients (age 47.6 ± 7.8 yrs, males 73.9%, ESC SCD Risk $3.9 \pm 0.4\%$), the baseline PR interval, E/A and E/e' were 178.2 ± 19.5 ms, 2.4 ± 0.5 , and 17.2 ± 2.3 , respectively. There was an improvement in diastolic function (E/A, E/e') in 16 patients (responders) when pacing from the RVA (1.5 ± 0.3 , $p < 0.001$; 12.9 ± 3.1 , $p < 0.001$) compared to the RVS (2.2 ± 0.5 , 16.5 ± 2.4) and RVO (2.2 ± 0.4 , 16.8 ± 2.1). There was no improvement in diastolic function in the three other patients (non-responders). In responders, optimal diastolic filling occurred at an AV delay of 130-160 ms during RVA. At shorter and longer SAD, there was a worsening of E/e' (Fig). Baseline RBBB (25% vs. 0%, $p = 0.212$) and lower LGE (12.4% vs. 23.2%, $p = 0.004$) were more common among responders. During follow up (9.8 ± 1.8 months), ventricular pacing was $98.3 \pm 1.4\%$. Compared to baseline, there was an improvement (Δ) in diastolic function ($E/A -1.0 \pm 0.3$, $E/e' -4.1 \pm 0.5$), NT proBNP (-51.4 ± 13.2 pg/ml), and functional capacity (NYHA -1.4 ± 0.3 , 6MWD -51.2 ± 6.7 m). There was no change in LVEF during follow up.

Conclusion: In a subset of patients with nHCM, dual chamber pacing from the RVA improved diastolic function and functional capacity.

EFFECT OF DUAL CHAMBER PACING FROM THE RV APEX AT VARIOUS AV DELAYS ON DIASTOLIC FUNCTION



ABSTRACT CA-529:

Mapping Techniques to Elucidate Mechanisms and Aid Ablation Strategy in Atrial Fibrillation Ablation

Friday, April 29, 2022

1:00 PM - 2:00 PM

CA-529-01

RENEWAL THEORY: A STATISTICAL APPROACH TO IMPROVE PATIENT SELECTION FOR PULMONARY VEIN ISOLATION-ONLY STRATEGY IN ATRIAL FIBRILLATION ABLATION

Alvin Quah

Background: Outcomes from pulmonary vein isolation (PVI)-only approach in AF remain suboptimal, especially in persistent AF (persAF) patients. However, results from STAR-AF 2 trial suggest the presence of a subgroup of persAF patients who were responders to PVI-only. While research efforts have primarily focused on which non-PVI ablation techniques to pursue in persAF patients, there has been a paucity of data to define a cohort of AF patients who are "PVI-only responders"

Objective: We recently showed a physiological assessment of fibrillatory dynamics could be performed using renewal theory, which determines rates of phase singularity formation (λ_f) and destruction (λ_d). Using the renewal approach, we aimed to define a cohort of patients who would be responsive to PVI-only approach, independent of the persAF status.

Methods: RENEWAL-AF is a prospective multicentre observational study recruiting AF ablation patients. Unipolar electrograms were obtained from sixteen biatrial locations using a 16-electrode Advisor TM HD-Grid catheter. Renewal rate constants λ_f , λ_d and the rho (ρ) values (λ_f / λ_d) were calculated. All patients had radiofrequency ablation using a PVI-only approach.

Results: N=48 AF patients were recruited (mean age 59.1 ± 9.4 years, 28.5% females). Two groups were analyzed; Phenogroup 1 (Ph1), highest ρ in pulmonary veins, Phenogroup 2 (Ph2), highest ρ in LA body. Ph1 patients had a lower CHA₂DS₂-VASc score ($P = 0.02$), and a smaller LA volume index ($P = 0.04$) compared to Ph2. After a follow-up of 5.15 ± 1.6 months, Ph1 was associated with lower atrial tachyarrhythmia (AT) recurrences ($P = 0.047$) with a lower AF burden ($P = 0.026$). No association was found between persAF status with AF Phenogroup classification ($P = 0.68$), AF burden ($P = 0.58$), or AF recurrence ($P = 0.52$). Additionally, AF Phenogroup was a significant predictor of AF recurrence in both univariate ($\beta +0.32$, 95% CI 0.002 0.64, $P = 0.048$) and multivariate analysis ($\beta +0.34$, 95% CI 0.039 0.65, $P = 0.028$).

Conclusion: Renewal theory approach provides a useful signal-based electrophysiological approach to the assessment of AF fibrillatory dynamics, linked to underlying AF-related clinical risk