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958 IMPACT OF CARDIAC SYMPATHETIC DENERVATION ON ELECTRICAL STORMS IN PATIENTS WITH CARDIOMIOPATHIES

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Background: Cardiac Sympathetic Denervation (CSD) has been recently proposed for the treatment of refractory ventricular arrhythmias (VAs) in patients with cardiomyopathy (CMP). A multicentric American and Indian case series suggested a greater efficacy of bilateral denervation (BCSD), compared to the left-side only procedure (LCSD), albeit with the potential prize of an increased need for atrial pacing due to the right-side innervation of the sinus node. The impact of CSD on the risk of electrical storms (ES) in CMP has never been evaluated.

Aim: To describe our multicenter Italian experience with CSD in CMP patients with drug and/or catheter ablation refractory VAs, with a specific focus on ES incidence.

Methods: Thirty patients with CMP and refractory VAs underwent either LCSD or BCSD between April 2016 and June 2022. Among them, one patient received first LCSD and then right-side denervation due to ES recurrence after LCSD: to properly assess the risk of ES after LCSD and BCSD he was included in both groups with the corresponding follow-up, leading to 5 cases of LCSD and 26 cases of BCSD. All patients had a Video-Assisted Thoracoscopic Surgery (VATS), in 8 cases associated with the robotic technique. The main reason (3/5 cases, 60%) to perform LCSD instead of BCSD since the beginning was sinus bradycardia in single ICD lead recipients.

Results: 87% of pts were male, the mean age was 56 ± 16 yrs and the mean LVEF $31 \pm 12\%$; most ($n=26$, 85%) suffered non-ischemic cardiomyopathy and 37% were in NYHA functional class ≥ 3 . Main indications for CSD were represented by refractory polymorphic/fast VAs (cycle length <250 msec) in 60% of pts and by refractory monomorphic VAs episodes in the rest. Except for 5 patients (17%) with previous thyrotoxicosis, the majority were either on amiodarone ($n=19$, 63%) or on sotalol ($n=3$, 10%) before CSD and 53% had previously undergone ≥ 1 catheter ablation for VAs. The median follow-up (FU) after denervation was 15 months (IQR 5-42 months).

No major complication directly related to the procedure occurred. Overall, 11 patients (37%) either died during FU ($n=8$, 27%), mostly due to end-stage heart failure, or underwent heart transplant ($n=3$, 10%). After denervation, the percentage of patients with ES decreased from 77% to 40% ($p<0.01$), while patients with appropriate shocks decreased from 100% to 60%. The antiarrhythmic benefit was even more pronounced among the 26 patients who received BCSD: ES incidence decreased from 85% to 39% ($p<0.01$), appropriate shock incidence from 100% to 54% ($p<0.01$), while no significant changes in ES and ICD shock incidence were observed after the few LCSD procedures ($n=5$). A NYHA class <3 was associated with a trend toward a better response after BCSD (37% vs 54% incidence of ICD shock, $p=0.05$).

Conclusions: Our case series of CSD in cardiomyopathies represents the largest reported in Europe and the first ever to specifically evaluate the impact of denervation on electrical storms. The occurrence of electrical storm was more than halved by bilateral CSD confirming the powerful protective effect of BCSD also on this ominous phenomenon. The greater antiarrhythmic benefit observed among patients with better functional class suggests the opportunity to perform this procedure earlier on in the trajectory of patients with progressive heart failure.