EXTERNALY-IRRIGATED RADIOFREQUENCY ABLATION IS SAFER AND MORE EFFECTIVE THAN NON-IRRIGATED ABLATION IN THE AORTIC CUSP REGION-INSIGHTS PROVIDED BY A RETROGRADE ICE-GUIDED APPROACH

ACC Poster Contributions
Georgia World Congress Center, Hall B5
Monday, March 15, 2010, 3:30 p.m.-4:30 p.m.

Session Title: Mapping and Ablation of Ventricular Tachycardia: New Insights
Abstract Category: Clinical Electrophysiology--Ventricular Arrhythmias
Presentation Number: 1190-141

Authors: Raveen R. Bazaz, Samir Saba, Brion Winston, University of Pittsburgh Medical Center, Pittsburgh, PA

Background: Ablation in the aortic cusp region may be compromised by failure as a result of inadequate lesion delivery and complicated by valve damage/thrombo-embolic complications secondary to endocardial disruption. We elected to gain insights into biophysical parameters leading to these issues using an intracardiac echocardiography (ICE) guided approach to ablation.

Methods: Nine pigs had ICE and ablation catheters delivered to the aortic root via a retrograde approach. Three lesions guided by ICE were delivered in each animal targeting myocardium under each individual aortic cusp. In 5 animals a standard 4mm non-irrigated (NIRF) and in 4 animals an externally irrigated (EIRF) catheter was used. Standard biophysical parameters were recorded. Post lesion delivery, triphenyl-tetrazolium chloride was used to identify ablation lesions.

Results: All lesions were delivered with firm contact as evidenced by ICE. A total of 27 lesions were examined that were all successfully delivered in the targeted aortic cusp for each individual lesion. The mean and standard deviations of biophysical parameters during NIRF lesions were: Temp (T) 59.9+4.7°C; Power (P) 20.6+3.7W; Impedance 124+15 Ω and duration 73+ 17s. In the EIRF lesions: T = 39.1+0.3°C; P=41.2+7.1 W; Impedance= 92+ 22Ω and duration=90 + 17s. Three lesions showed cratering (endocardial disruption >1mm) with valve perforation and/or char. All cratered lesions were noted only in the NIRF group with T being the only parameter associated with crater formation (p<0.001). (Mean T with crater =66.6+3°C) Minor pitting (endocardial disruption <1mm without char) was noted in two NIRF lesions in animals with electrode T between 55-60°C. EIRF lesions revealed no evidence of endocardial disruption, pitting or valve damage (p<0.04). Conclusions: An electrode T > 55°C may be achieved with relatively low powers during aortic cusp ablation using NIRF with evident cratering and valve damage that can have significant implications. EIRF is noted to be capable of delivering high powers with no evidence of endocardial disruption, pitting or valve damage during aortic cusp ablation. EIRF should be the preferred ablation modality for aortic cusp ablation.