Ablation of Ventricular Tachycardia in Chronic Chagasic Cardiomyopathy With Giant Basal Aneurysm
Carto Sound, CT, and MRI Merge

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Chronic chagasic cardiomyopathy (CCC) is a parasitic disease that presents with life-threatening ventricular arrhythmias, dilated cardiomyopathy, or sudden death. Basal and posterior wall motion abnormalities and left apical aneurysms are common.

We present a report of a patient with CCC, sustained ventricular tachycardia (VT) refractory to amiodarone 400 mg/day and carvedilol 25 mg/day BID with a giant left basal aneurysm as visualized by CT scan and intracardiac echocardiogram 3D reconstruction (Carto Sound). The patient underwent preprocedural CT scan data acquisition with 64-slice MDCT scanner Aquilion (Toshiba, Tochigi, Japan), and the images were used for 3D reconstruction with Cartomerge (Biosense Webster, Inc., Diamond Bar, CA). Images acquired using cardiac MRI confirmed the size and shape of the aneurysm. No significant scar was observed in other areas of the LV. Images of the CT Scan and Carto Sound acquired with Soundstar catheter and electroanatomic mapping were merged and ablation was performed with a 3.5-mm cooled-tip catheter (Figures 1 and 2). Programmed right ventricular stimulation with 2 extra stimuli induced sustained VT. Endocardial and epicardial mapping was performed in sinus rhythm (voltage mapping) and during VT (activation mapping). During epicardial mapping in sinus rhythm, surface voltage exceeded 1.5 mV, and during VT no evidence of epicardial circuit was found. Intracardiac echocardiography with image integration was helpful for catheter tip location (Figure 3) and ablation of the aneurysm border. Mid-diastolic potentials (Figure 4, left) and concealed entrainment indicated an endocardial circuit isthmus located between the aneurysm proximal border and the mitral valve. When the endocardial circuit was localized, radiofrequency energy was delivered interrupting the VT. Late potentials could be seen on that site, and they were also targeted (Figure 4, right). An implantable cardioverter-defibrillator was implanted and the patient remained free of the clinical VT.

Intracardiac echocardiogram integration with electroanatomical mapping is a novel tool for image integration and may improve anatomy visualization for catheter ablation of cardiac arrhythmias.1–3

Disclosures

None.

References

Figure 1. Comparison of CT scan and ICE-3D reconstructed images. Two different maps were used to get a better definition of the aorta and cusps and the LV epicardium. Left, The ascending aorta and its relation to the endocardial LV voltage map are visible. Right, The anatomy of the three cusps. Red indicates areas of amplitude <0.52 mV; purple, amplitude >1.51 mV (same voltage scale as Figure 2).

Figure 2. Integration of images was performed using the coronary cusps and coronary ostia as visualized by ICE, the endocardial voltage EA map, and the CT scan data. Red indicates areas of amplitude <0.52 mV; purple, amplitude >1.51 mV.
Figure 3. Images were acquired in real time during ablation. Left, A view with only ICE. Right, An LV endocardial voltage map is combined with CT scan data reconstruction. The catheter tip is near the mitral valve, and the aneurysm borders are clearly visible, as well as the distance between the proximal and the distal borders of the aneurysm. Red indicates areas of amplitude $<0.52$ mV; purple, amplitude $>1.51$ mV.

Figure 4. Left, Clinical VT induced and nidi-diastolic potentials. Middle, ICE-3D endocardial LV activation map in sinus rhythm with successful ablation target highlighted. Right, VT termination during ablation in a site with late fragmented potentials. The dashed red circle indicates the catheter tip position during the events described in the left and right panels (mid-diastolic potentials, VT termination during ablation, and late potentials).
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