

CLINICAL VIGNETTE

Ablation of symptomatic ventricular tachycardia after surgical correction of ventricular septal defect in childhood: using high-density mapping, how precise is EnSite Precision?

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A 44-year-old man with a history of surgical correction of ventricular septal defect at the age of nine years and recurrent syncope with documented sustained and non-sustained ventricular tachycardia (VT) in 24-h Holter electrocardiogram monitoring was referred for an emergency electrophysiological evaluation. Echocardiography revealed left ventricular ejection fraction of 45% and left ventricular end-diastolic diameter of 51 mm. No abnormalities were observed in coronary arteries. We used a retrograde approach to reach the left ventricle and performed high-density mapping (LiveWire™, Abbott, Lake Buff, IL, USA) of the left ventricle. We collected 12,189 points, 1708 of which were used (best-duplicate algorithm, EnSite Precision™; mapping time 26 min; Fig. 1) for the final bipolar voltage map, which revealed a low-voltage area (LVA) and two scar areas (SCAs) (0.5–1.5 mV and < 0.5 mV, respectively; Fig. 1A) within the interventricular septum (IVS; Fig. 1B). Additionally, the created map showed an LVA and SCA on the basal posterior wall (BPW), i.e. the surgical access used when the patient was nine years old. (Fig. 1C). We identified both His bundle and left bundle branch (yellow dots; Fig. 2) and performed homogenisation (TactiCath™, Abbott;

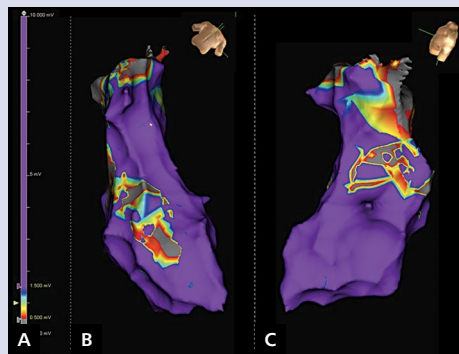


Figure 1. Bipolar voltage maps; **A.** Colour-coded voltage setting: scar < 0.5 mV in grey, low-voltage area 0.5–1.5 mV, and normal “healthy” myocardium > 1.5 mV in purple; **B.** Two scars (grey area) and low-voltage area (red, yellow, and blue) on inter-ventricular septum; **C.** Prior surgical access on basal posterior wall: scar (grey area) and low-voltage area (red, yellow, and blue)

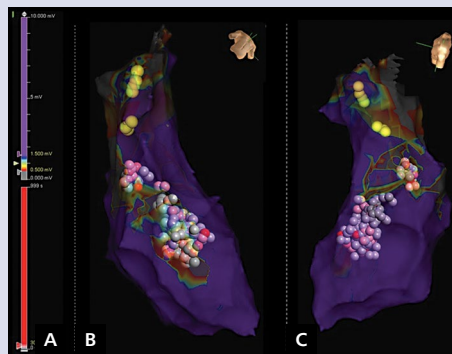


Figure 2. Radiofrequency (RF) ablation: **A.** Colour-coded voltage bipolar map setting (upper panel) and time of RF application in seconds (lower panel); **B.** Semi-transparent bipolar voltage map: RF applications on interventricular septum covering the region between the two scars. **C.** Semi-transparent bipolar voltage map: RF applications in the region of prior surgical access on the basal posterior wall; yellow dots — His and left bundle potentials



Figure 3. No arrhythmia induction despite: **A.** Aggressive programmed ventricular pacing down to S1-S4 (cycle length of 380–220–220–180 ms); **B.** Burst pacing (30 s with cycle length of 300 ms)

45°C and 45 W, increased up to 50 W during application, catheter-tissue contact: 27–32 g) of the LVA within the IVS and additionally in the BPW (Fig. 2). VT was inducible during LVA ablation only. In aggressive pacing with S1-S4 (maximally down to 380–220–220–180 ms; Fig. 3A) and burst pacing (30 s, cycle length of 300 ms; Fig. 3B) no arrhythmia was inducible. Total procedure and fluoroscopy times were 2.5 h and 11 min, respectively. The patient was discharged the next day and has not had any ventricular arrhythmia or syncope recurrence within three months of follow-up.

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