Ablation of ventricular tachycardia using CT with the inHEART3D cardiac model

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Introduction: The ablation of ventricular tachycardia (VT) is increasingly performed in patients with sustained VT. The development of inHEART Models software as a three dimensional (3D) cardiac model allows preoperative planning for VT ablations and therefore targeted elimination of VT isthmi.[1] The goal was to showcase a single-center experience since the introduction of this new visualisation modality.

Patients and Methods: This was a retrospective, single-center analysis. All patients that underwent VT ablation aided by the inHEART system were included in the study, accumulating to a total of 20 patients. The ablations were executed using Carto3 EAM system with mapping generated via multipolar mapping catheter and subsequently merged with the inHEART model.

Results: Majority of patients were the ones with ischemic cardiomiopathy (n=17, 85.0%) and the rest were non-ischemic (n=3, 15.0%). The mean age during ablation was 64.1 ± 9.5 years with 18 patients being male (90.0%). Average left ventricular ejection fraction was 29.8 ± 6.9% and 4 patients had previous VT ablations (20.0%). Average period from first registered VT to ablation was 28.6 ± 26.3 months. Mean procedure duration was 220.5 ± 61.5 min with fluoroscopy time of 15.5 ± 7.6 min, average radioation dose of 36.5 ± 34.6 mGy and ablation time of 2363.2 ± 889.8 sec. In 14 patients there was an episode of VT during the procedure, either provoked or during mapping or ablation and in 9 patients DC was performed. In 6 patients (28.5%), any VT was still inducible after the ablation, none of which were clinical. During follow-up a total of 10 patients had registered ICD activation with ATP and in 4 cases DC was necessary.

Conclusion: The use of CT inHEART 3D cardiac model enables more detailed preoperative planning of VT ablations which can yield better results. The data from our center show an encouraging effect of this new technology.

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LITERATURE

1. Englert F, Bahlke F, Erhard N, Krafft H, Popa MA, Risse E, et al. VT ablation based on CT imaging substrate visualization: results from a large cohort of ischemic and non-ischemic cardiomyopathy patients. Clin Res Cardiol. 2024 Oct;113(10):1478-1484. https://doi.org/10.1007/s00392-023-02321-1