

Title: Open Surgical Ablation of Ventricular Tachycardia: Utility and Feasibility of Contemporary Mapping and Ablation Tools.

Author names, academic degrees, and affiliations: Megan Kunkel BS^a; Peter Rothstein, MD^b; Peter Sauer^c; Matthew M. Zipse, MD^a; Amneet Sandhu, MS, MD^{a,d}; Alexis Z. Tumolo, MD^a; Ryan T. Borne, MD^a; Ryan G. Aleong, MD^a; Joseph C. Cleveland, Jr., MD^a; David Fullerton, MD^a; Jay D. Pal, MD, PhD^a; Austin S. Davies, BS^e; Curtis Lane, BS^e; William H. Sauer, MD, FHRS^c; Wendy S. Tzou, MD, FHRS^a

^aUniversity of Colorado School of Medicine, Division of Cardiology, Section of Cardiac Electrophysiologist, Aurora, CO

^bHouston Methodist DeBakey Heart & Vascular Center, Houston, TX

^cBrigham and Women's Hospital, Cardiac Arrhythmia Service, Boston, MA

^dVA Eastern Colorado Health Care System, Aurora, CO

^eAbbott, St. Paul, MN

Background Ventricular tachycardia (VT) catheter ablation success may be limited when transcatheter epicardial access is contraindicated. Surgical ablation (SurgAbl) is an option, but ablation guidance is limited without simultaneously acquired electrophysiological data.

Objective We aim to describe our SurgAbl experience utilizing contemporary electroanatomic mapping (EAM) among patients with refractory VT storm.

Methods Consecutive patients with recurrent VT despite antiarrhythmic drugs (AADs) and prior ablation, for whom percutaneous epicardial access was contraindicated, underwent open SurgAbl using intra-operative EAM-guidance.

Results Eight patients were included, among whom mean age was 63±5 years, all were male, mean left ventricular ejection fraction was 39±12%, and 2(25%) had ischemic cardiomyopathy. Reasons for surgical Epi access included dense adhesions due to prior cardiac surgery, hemopericardium, or pericarditis (n=6), or planned left ventricular assist device (LVAD) implantation at time of SurgAbl (n=2). Cryoablation guided by real-time EAM was performed in all. Goals of clinical VT non-inducibility or core isolation were achieved in 100%. VT burden was significantly reduced, from median 15 to 0 events in the month pre- and post-SurgAbl (p=0.01). One patient underwent orthotopic heart transplantation for recurrent VT storm 2 weeks post-SurgAbl. Over mean follow-up of 3.4±1.7 years, VT-storm-free survival was achieved in 6(75%); all continued AADs, although at lower dose.

Conclusion Surgical mapping and ablation of refractory VT with use of contemporary electroanatomic mapping is feasible and effective, particularly among patients with contraindication to percutaneous epicardial access or with another indication for cardiac surgery.