

# Concomitant Surgical Cryoablation for Refractory Tachycardia during Left Ventricular Assist Device Implantation for Ischemic Cardiomyopathy

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## INTRODUCTION

For patients with advanced heart failure (HF), placement of a continuous-flow left ventricular assist device (LVAD) has been shown to provide significant improvements in survival and quality of life. Patients with ventricular tachycardia (VT) and advanced HF undergoing LVAD implantation are still at risk for recurrent VT post LVAD. VT after LVAD has been associated with an increased overall mortality. However, there were few reports about surgical cryoablation for recurrent and refractory VT. We report a case of concomitant surgical cryoablation for refractory VT during LVAD implantation as a destination therapy.

## CASE REPORT

A 56-year-old male with a history of ischemic cardiomyopathy originally diagnosed in 2005 with an ejection fraction of 10%, status post DES to the left circumflex artery, implantable cardioverter defibrillator (ICD) in 2012 upgraded to biventricular ICD in 2017, presented to the hospital with recurrent malignant VT and multiple ICD shocks. The electrophysiology team performed an ablation and targeted a large inferior wall scar with ablation from the endocardium and epicardium. The patient was also maintained on amiodarone and lidocaine for recurrent VT. Our multi-disciplinary team evaluated him as an appropriate candidate for LVAD as destination therapy.

### **Preoperative voltage mapping** (Figure 1):

A voltage map was created from LV endocardium using the Carto 3 mapping system and demonstrated a large region of scar along the inferior wall extending from the mitral valve to the base of the posteromedial papillary muscle. Multiple regions of fractionated signals and late potentials were noted. Endocardial and epicardial ablation was performed within the scar as seen by the red tags on the map.

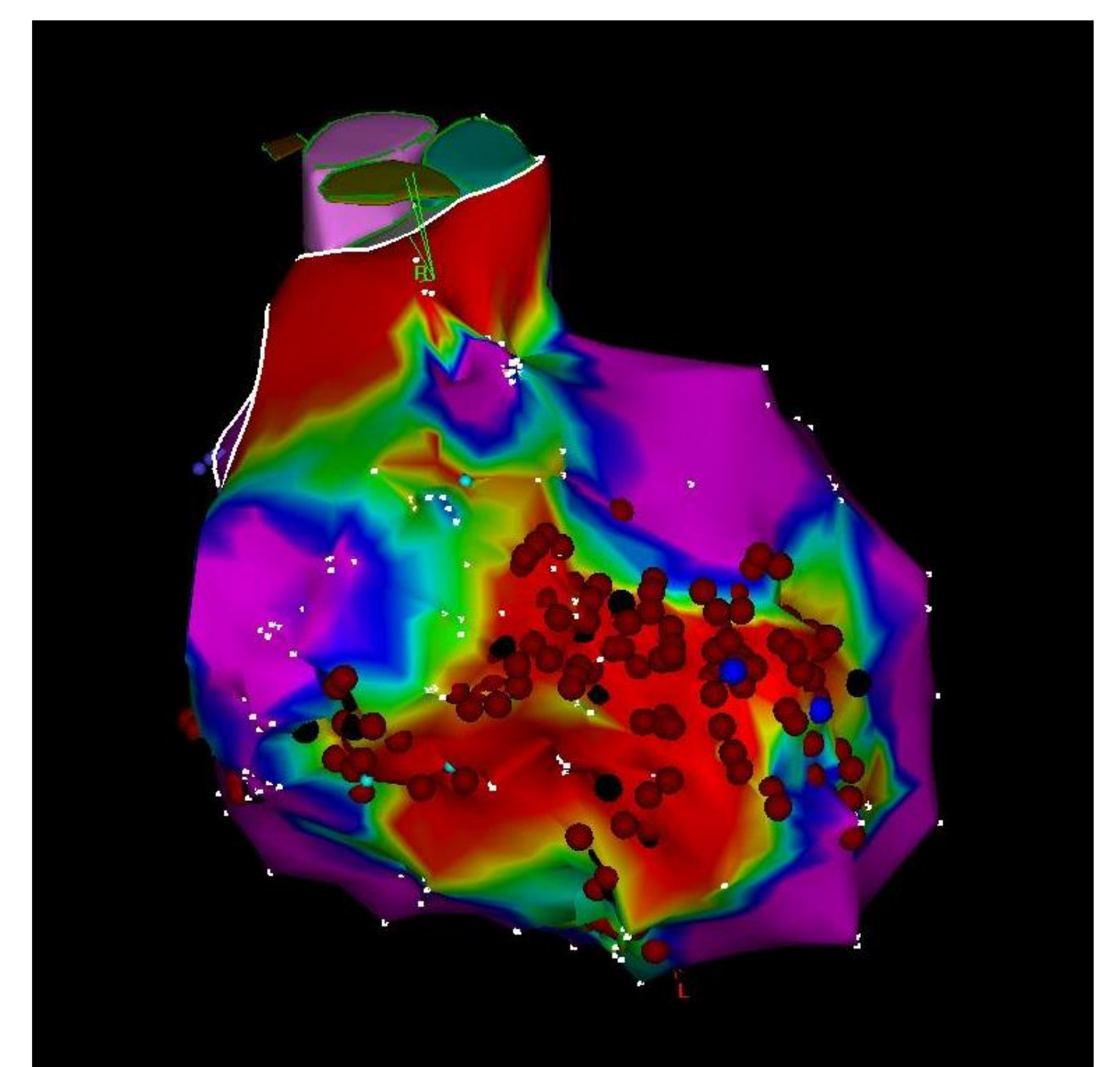


Figure 1

### **Surgical procedure:**

After initiation of cardiopulmonary bypass, the coring device was used to make a hole. There was no mural thrombus at the apex. The recent ablation scar in the left ventricle was identified. Five cryoablations (Cardioblate CryoFlex, Medtronic, Minneapolis, MN, USA) were applied for the endocardium for 2 minutes each at -124, -135, -145, 139, and -118 °C. Cryoablation at the inferior septum, between the posteromedial and antero-lateral papillary muscles and the bottom of the posteromedial papillary muscle were indicated by preoperative endo and epicardial mapping (Figure 2). After completion of cryoablation, LVAD was implanted in a standard fashion.

The patient was subsequently discharged 18 days after the LVAD implant and cryoablation. He had readmissions for heart failure and supratherapeutic INR (14.6) with epistaxis and gum bleeding. However, he has been free of any further VT for about 6 months.

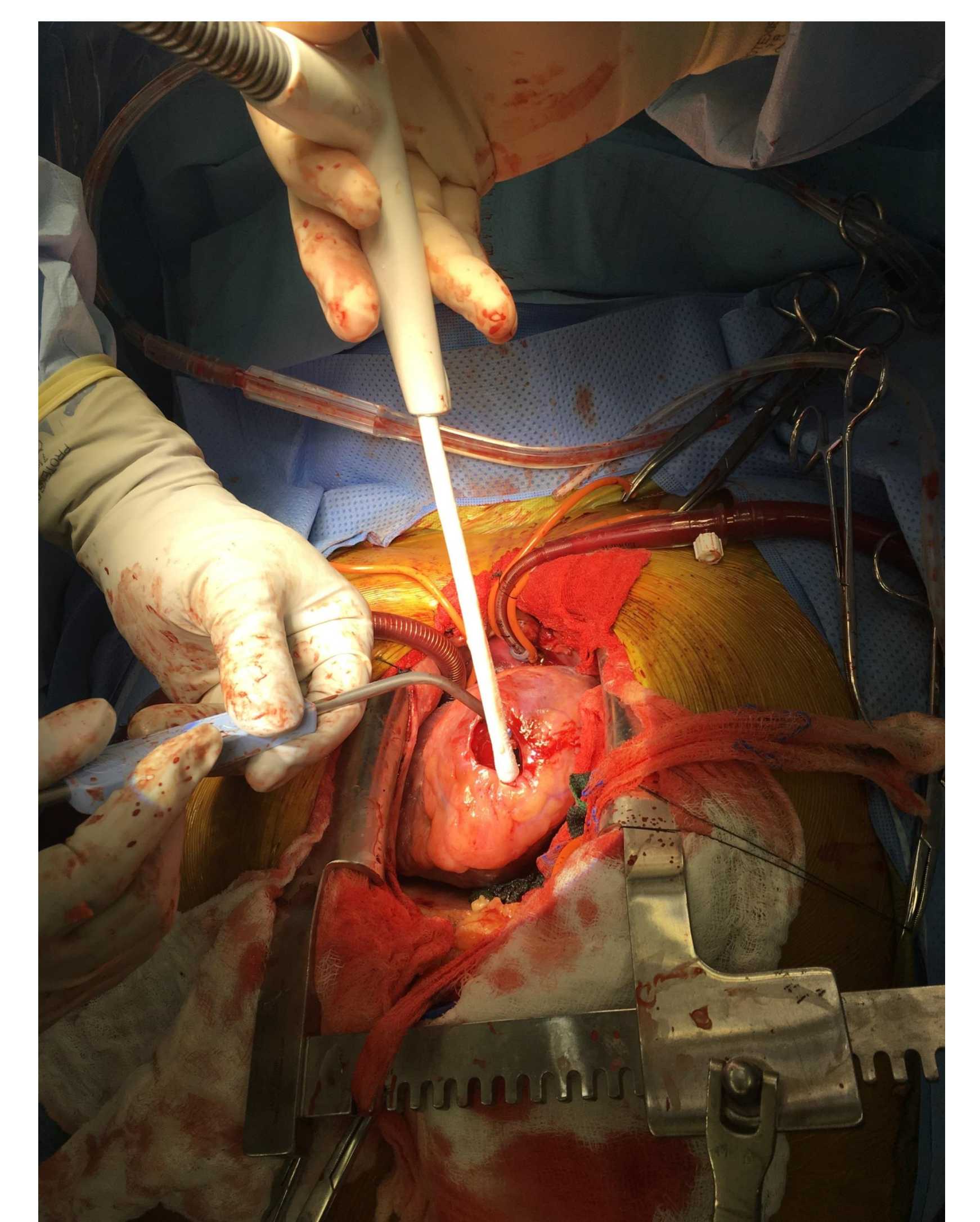


Figure 2

## CONCLUSION

We demonstrated that intraoperative surgical cryoablation can be accomplished with concomitant LVAD implantation for HF patient with recurring malignant VT.