

## Use of an Apical Suctioning Device for Placement of a Posterior Epicardial Defibrillator Patch: A Case Report

Fotios A. Mitropoulos, MD,<sup>1,2</sup> Jonah Odum, MD, PhD, MBA,<sup>2</sup> Hillel Laks, MD<sup>2</sup>

<sup>1</sup>University of Athens School of Medicine, Athens, Greece; <sup>2</sup>Division of Cardiac Surgery and Pediatric Cardiology, David Geffen School of Medicine, University of California Los Angeles, Los Angeles, California, USA

### ABSTRACT

We report a case of a 43-year-old man with dilated cardiomyopathy and intractable ventricular tachycardias who did not respond to percutaneous implantable cardioverter defibrillator therapy and required implantation of epicardial patches. An apical suctioning device was used to retract the apex of the heart outside the mediastinal domain. The device provided excellent exposure and hemodynamic stability to safely implant the posterior epicardial patch.

### INTRODUCTION

Implantable cardioverter defibrillators (ICDs) are considered standard therapy for patients at high risk for ventricular tachyarrhythmias. The majority of the defibrillators are placed under fluoroscopy using the percutaneous transvenous technique, which has minimal morbidity and mortality. We report a patient with alcoholic dilated cardiomyopathy and recurrent ventricular arrhythmias who did not respond to percutaneous dual chamber ICD and subcutaneous array implantation. A new technique safely positioned the epicardial patch on the posterior left ventricular wall by retracting the apex of the heart with an apical suctioning device.

### CASE REPORT

A 43-year-old man with a history of alcohol abuse and dilated cardiomyopathy was in cardiogenic shock and had an intraortic balloon pump and inotropic support when he was transferred to our institution. He had episodes of unstable atrial fibrillation, ventricular tachycardia, cardiac arrest, and subsequent resuscitation. His ejection fraction was 20%

with 2 to 3+ mitral regurgitation and a left ventricular end-diastolic dimension of 68 mm. He had a transvenous dual-chamber ICD placed (Ventak; Guidant, Santa Clara, CA, USA) that failed to terminate induced ventricular tachycardia except with the use of external shock at 360 joules. Despite these measures including placement of a subcutaneous array, he was defibrillated successfully only with high-dose external shocks.

He was taken to the operating room for placement of epicardial patches. The heart was massively dilated, and manipulation to present the posterior left ventricle resulted in hemodynamic collapse. The Guidant Axius Xpose device was used to pull the apex of the heart out of the chest, exposing the posterior left ventricular free wall, and the posterior patch was sewn with 3-0 prolene sutures (Figure). The central venous pressure rose from 14 to 18 mmHg and the systolic blood pressure remained at 95 mmHg with this maneuver.

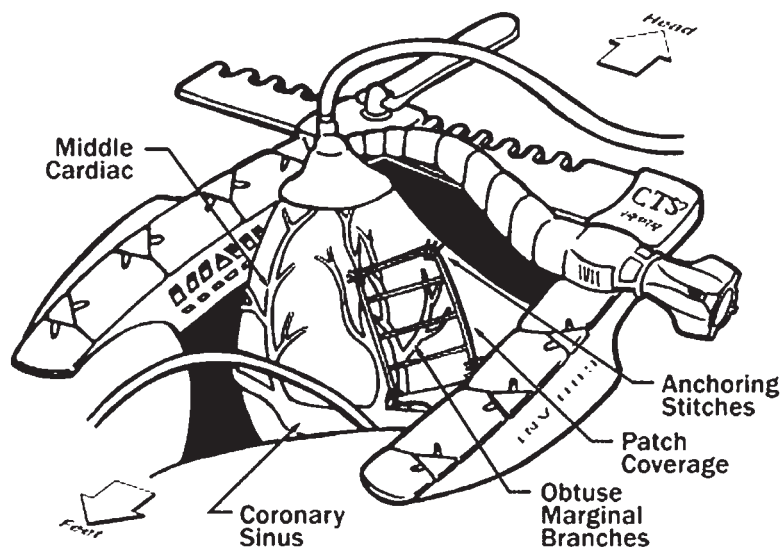
The heart was then returned to the chest and the anterior patch was sewn to the right ventricular free wall. Despite optimal position of the epicardial patches, we could not defibrillate the heart after ventricular tachycardia induction except with the use of internal paddles. The patient recovered from the procedure and was listed for heart transplantation because of his predicament. He later underwent retesting of the implantable defibrillator in the operating suite with back-up wet pump standby and guidewires in the femoral artery and vein. He was successfully defibrillated 3 times in a row with low thresholds. The patient was discharged home and at 2-year follow-up after surgery he was doing well.

### DISCUSSION

Michel Mirowski pioneered the development of the ICD in the late 1960s after the loss of a dear friend and mentor who expired from recurrent ventricular arrhythmias [Mirowski 1980]. ICDs have evolved from a last-resort treatment option in patients with documented cardiac arrest to the gold standard for those at high risk for life-threatening arrhythmias [Glikson 2001]. The mode of implantation, too, has evolved and is presently performed under fluoroscopic guidance using a percutaneous transvenous technique. The results of this approach are excellent and the

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*Address correspondence and reprint requests to: Fotios A. Mitropoulos, MD, PhD, University of Athens School of Medicine, Monastiriu 8, Thracomacedones, Athens, Greece, 13676; 011-30210-2433431; fax: 011-30210-2433431 (e-mail: fotiosmitropoulos@yahoo.com).*



Use of the apical suctioning device (Axis Xpose; Guidant, Santa Clara, CA, USA) to expose the posterior left ventricular wall for placement of the epicardial defibrillator patch.

transthoracic route is reserved for use after transvenous approach failure, whenever the chest is already open, or for the pediatric population [Furman 1991; Gregoratos 2002]. In this patient, the large size of the heart and electrical excitability did not permit lifting the heart for suturing the posterior patch in place. The use of the exposing device allowed retraction of the apex of the heart from its mediastinal domain and facilitated placement of a posterior epicardial patch in the circumflex territory with minimal hemodynamic compromise. In addition, it allowed secure suturing of the patch without damaging the underlying coronaries, and thus cardiopulmonary bypass was avoided. The possibility of a left thoracotomy approach was entertained but the patient's tenuous hemodynamic condition in association with electrical excitability and an enlarged left ventricle forced us to use the safest approach through a full sternotomy. Since then, we have found the exposing device extremely valuable in reoperations for bleeding where the bleeding site was a distal circumflex anastomosis. The Xpose provides excellent traction of the heart to allow positioning of the heart for procedures other than off-pump coronary artery bypass grafting.

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