

Case Report: Electroconvulsive Therapy for Treatment Resistant Depression in a 68 year old male with a Cardiac Resynchronization Therapy Device with Defibrillator

PRESENTER:
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BACKGROUND:

Electroconvulsive therapy has been safely and successfully applied in patients with cardiac pacemakers and implantable cardiac devices, and reviewed in a number of case reports(1, 2). Cardiac Resynchronization Therapy Devices (CRT), available with and without defibrillation, benefit patients with Heart Failure with reduced ejection fraction (HFREF) by improving left ventricular function, optimizing ventricular filling, and confers benefits in quality of life and mortality (3). There are currently no case reports on the use of ECT in patients with cardiac resynchronization therapy devices.

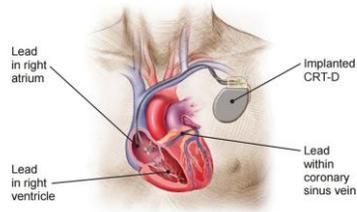


Image Source: <https://www.bostonscientific.com/en-US/patients/about-your-device/crt-devices/how-crts-work.html>

METHODS:

Patient is a 68-year-old male with a history of major depressive disorder, PTSD, cluster B personality traits who presented in December 2019 for suicidal ideation in the context of a major depressive episode. His medical history is notable for atrial fibrillation on warfarin, DM2 on insulin, non-ischemic cardiomyopathy with HFREF. In 2015, patient's ICD was replaced with CRT-D.

He had a history of 4 previous suicide attempts, most recently four years ago as well as a history of self-injurious behavior. His suicidal ideation on this admission was notable for newly observed auditory hallucinations telling him to harm himself, suggestive of a mood-congruent psychosis. Patient was started on low-dose risperidone. His other psychotropic medications included bupropion, venlafaxine, and gabapentin with multiple failed medication trials in the past. Patient's initial MADRS was 30 on admission scoring highly for suicidal ideation. After initiation of Risperidone, patient's MADRS lowered to 16 prior to first ECT session.

Prior to ECT, anesthesia, cardiology, and electrophysiology were consulted. Patient's CRT-D device was interrogated and determined to be functioning and patient medically optimized for ECT from cardiology standpoint. His ejection fraction was 30% approximately 6 months earlier. Anesthesia expressed concern about management of sympathetic and parasympathetic response to ECT.

This is the first case report of successful administration of Electroconvulsive Therapy in a patient with a Cardiac Resynchronization Therapy Device with Defibrillator.

Table 1.	Cardiac Resynchronization Therapy
Function	Electrical stimulus to synchronize contraction of ventricles
Indications	HFREF EF <35%, sinus rhythm, QRS >150 and LBBB pattern, NYHA Class III,
Benefits	Improvement in Left ventricular function, optimized ventricular filling, improvement in quality of life and mortality benefit.
Theoretical Contraindications to ECT	Inadvertent activation of Defibrillator by ECT stimulus, disruption of biventricular pacing due to ECT stimulus, myopotentials

Results: Prior to first session, Electrophysiology (EP) reprogrammed device to electrocautery mode and patient had defibrillator pads placed. A brief seizure was achieved. Due to no observed bradycardia after first session, EP recommended patient can undergo further ECT with placement of magnet on CRT-D to disable defibrillator. For the following 3 sessions, an adequate seizure was obtained. Patient reported robust response with MADRS of six reported prior to his second session. During ECT therapy, patient underwent CP ECHO which indicated ejection fraction of 20-25%. Cardiology was again consulted and felt patient could continue with ECT if euvolemic and asymptomatic. After 4th session, a collaborative decision was made with patient to forego further ECT given patient's improvement in mood. Prior to discontinuation, MADRS score was zero.

Conclusion: This case indicates ECT can be provided safely to patients with a CRT-D device; placing device in electrocautery mode with defibrillator pads as well as disabling defibrillator function with a magnet both proved effective methods to provide ECT safely. Further study of ECT in patients with CRT is warranted, in particular, to observe patients who complete a number of sessions more typical in treatment resistant depression. ECT in patients with CRT-P devices have not been studied, although they differ only in the placement of defibrillator.

References:

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