

Baroreflex Activation Therapy is a Novel Approach in Heart Failure Management

Coridad Grazette*

Department of Surgery, University of Miami, Miami, USA

Corresponding author: Coridad Grazette, Department of Surgery, University of Miami, Miami, USA, E-mail: grazette@gmail.com

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Description

Chronic over activation of the sympathetic autonomic nervous system is recognized as a significant contributor to the pathophysiology of Heart Failure with reduced Ejection Fraction (HFrEF), irrespective of its underlying cause. Consequently, therapeutic strategies targeting this maladaptive response are crucial in managing HFrEF patients. In recent years, device-based therapies have emerged as promising interventions to complement traditional pharmacological approaches, aiming to alleviate the burden of polypharmacy and enhance treatment options for these complex patients. The prevalence of heart failure continues to rise globally, posing significant challenges to healthcare systems and necessitating innovative approaches to improve patient outcomes. While pharmacological therapies remain cornerstone treatments for heart failure, their efficacy may be limited in certain patients, particularly those with advanced disease or medication-refractory symptoms. In this context, device-based therapies offer a promising avenue for addressing the complex pathophysiology of heart failure and enhancing treatment options for patients who may not derive adequate benefit from traditional pharmacotherapy alone.

Cardiac function

Beyond Baroreflex Activation Therapy, other device-based interventions have garnered attention for their potential role in heart failure management. Cardiac Resynchronization Therapy (CRT), Implantable Cardioverter-Defibrillators (ICDs), and Left Ventricular Assist Devices (LVADs) are among the established device therapies used in select heart failure patients. These interventions aim to improve cardiac function, prevent sudden cardiac death, and alleviate symptoms, thereby enhancing patients' quality of life and prognosis. CRT delivers synchronized electrical impulses to both ventricles of the heart, thereby optimizing ventricular contraction and improving cardiac output in patients with dyssynchronous ventricular contraction patterns. Similarly, ICDs detect and terminate life-threatening arrhythmias, reducing the risk of sudden cardiac death in high-risk patients with heart failure. LVADs, on the other hand, provide mechanical circulatory support by assisting or replacing the function

of the left ventricle, offering a bridge to transplantation or destination therapy in patients with end-stage heart failure. One such innovative therapy is Baroreflex Activation Therapy (BAT), which operates on the principle of direct electrical stimulation of carotid baroreceptors. This stimulation triggers centrally mediated afferent sympathetic inhibiting fibers and efferent activating vagal fibers, ultimately leading to improvements in heart failure symptoms. The Barostim NEO system, granted premarket approval in 2019, represents a pioneering device in BAT, offering a novel avenue for managing HFrEF patients refractory to conventional Goal-Directed Medical Therapy (GDMT). The successful implementation of BAT programs necessitates a multidisciplinary approach, with vascular surgeons playing a pivotal role within the heart failure management team.

Exercise capacity

Their expertise in vascular anatomy, surgical techniques, and device implantation procedures is invaluable in ensuring the safe and effective deployment of BAT devices. Collaborative efforts between vascular surgeons, cardiologists, electrophysiologists, and other specialists are essential to optimize patient selection, procedural outcomes, and long-term clinical benefits. In this study, we describe the establishment of a BAT program at a large tertiary academic institution and retrospectively analyze the outcomes of patients who underwent BAT device implantation since the program's inception. Our analysis aims to provide insights into the real-world clinical utility and efficacy of BAT in HFrEF management. Key outcome measures include improvements in quality of life, exercise capacity, biomarker levels (e.g., N-terminal pro-brain natriuretic peptide), and overall disease burden. Baroreflex Activation Therapy represents a promising addition to the armamentarium of heart failure management strategies. As device-based therapies continue to evolve, collaborative efforts among healthcare professionals are essential to optimize patient outcomes and advance the field of heart failure care. Further research endeavors are warranted to elucidate the long-term efficacy, safety profile, and cost-effectiveness of BAT, thereby facilitating its integration into routine clinical practice and improving the prognosis of HFrEF patients.