The Electrocardiogram Following Dynamic Cardiomyoplasty

Andrew Oehler, M.D.¹ and Joseph Chiovaro, M.D.^{1,2}

¹Department of General Internal Medicine, Oregon Health & Science University, Portland, OR, USA; ²Division of Hospital and Subspecialty Medicine, Portland Veterans Affairs Medical Center, Portland, OR, USA.

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A 66-year-old man with ischemic cardiomyopathy status post-dynamic cardiomyoplasty in 1994 and revision 2 months prior to admission presented with increasing erythema around the site of his muscle stimulator. An ultrasound of the stimulator pocket showed no fluid collection, and the patient was started on intravenous antibiotics. The ECG revealed artifactual spikes from the latissimus dorsi muscle (LDM) stimulated to contract in synchrony with cardiac systole: typical changes following dynamic cardiomyoplasty (Fig. 1).

Cardiomyoplasty is a surgical treatment for end-stage heart failure that is an alternative to heart transplant, whereby the LDM is pedunculated and wrapped around the heart (Fig. 2). This wrap is then “conditioned” by electrical stimulation to reduce fatigability, transforming the fast-twitch skeletal muscle into slow-twitch fibers similar to cardiac muscle. Dynamic cardiomyoplasty was hypothesized to improve systolic function via augmented contraction and to reduce remodeling by a girdling effect of the wrap, with most clinical benefit arising from the latter. The procedure fell out of favor in the USA, primarily due to (a) improvement in ejection fraction but neutral effect on invasive hemodynamics,² (b) lack of long-term mortality improvement² and (c) Medtronic withdrawal of their cardiomyostimulators in the late 1990s, leaving surgeons without an FDA-approved device.³

Figure 1 Electrocardiogram demonstrating artifact from latissimus dorsi stimulator.

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Figure 2 Dynamic cardiomyoplasty using the left latissimus dorsi muscle flap. (Image used with permission from J.C. Chachques et al.¹).

Corresponding Author: Andrew Oehler, M.D.; Department of General Internal Medicine, Oregon Health & Science University, Portland, OR, USA (e-mail: oehler@ohsu.edu).

Compliance with Ethical Standards:

Conflict of Interest: The authors declare that they do not have a conflict of interest.

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