

IMAGING VIGNETTE

INTERMEDIATE

CLINICAL VIGNETTE

# A Rare Case of Epicardial Lead Strangulation of Left Ventricular Inflow



Juan C. Samayoa, MD, Susan P. Etheridge, MD, Richard V. Williams, MD

## ABSTRACT

This is an unusual case of left atrioventricular groove strangulation by an abandoned epicardial pacing lead associated with mild left ventricular inflow obstruction, left atrial enlargement, and new atrial tachycardia that resolved with surgical lead removal. (**Level of Difficulty: Intermediate.**) (J Am Coll Cardiol Case Rep 2020;2:835-6) © 2020 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

A 14-year-old female born with complete heart block secondary to maternal lupus underwent dual-chamber epicardial pacemaker implantation at age 11 months. Atrial and ventricular leads were placed through a limited lower sternotomy incision (the atrial lead was placed at the atrial-caval junction). Her postoperative course was complicated by post-pericardiotomy syndrome. At 9 years of age, she was noted to have a prominent posterior ridge above the mitral valve without obstruction by transthoracic echocardiogram (TTE). Follow-up TTE continued to demonstrate evidence of the ridge with a stable, mild, mean inflow gradient. At 13 years old, she underwent generator replacement with transvenous endocardial leads and explantation of the abdominal generator. The epicardial leads were abandoned. Imaging at that time demonstrated the posterior ridge above the mitral valve with mild left ventricular inflow obstruction (mitral inflow peak gradient of 10 mm Hg, a mean gradient of 4 mm Hg, and a heart rate of 69 beats/min) and mild left atrial enlargement (**Figure 1, Videos 1, 2, 3, and 4**). Chest radiographs suggested a posterior course of the abandoned lead (**Supplemental Figure 1**). She subsequently developed atrial tachycardia, possibly a consequence of left atrial enlargement. She underwent surgical removal of the epicardial leads through a repeat sternotomy. The atrial epicardial lead was deeply scarred and tethered at the left atrioventricular groove posteriorly. She had an uneventful postoperative course. Since the lead removal, she has done well, without mitral inflow gradient (a peak mitral inflow gradient of 3 mm Hg, a mean 1 mm Hg, and a heart rate of 70 beats/min) or further arrhythmia episodes (**Videos 5 and 6**).

This is an unusual case of left atrioventricular groove strangulation by an abandoned epicardial pacing lead with mild left ventricular inflow obstruction, left atrial enlargement, and atrial tachycardia that resolved with surgical lead removal. The authors speculate that a redundant lead placed within the pericardium migrated around the left ventricular apex after placement. Although this phenomenon is uncommon, epicardial leads causing cardiac strangulation and coronary compression have been described, with a reported incidence of 0.01% to 5.5% (1,2). More commonly, these leads have been identified postmortem or in patients presenting with symptoms of myocardial ischemia; mortality has been reported to be 1.2% (1). To date, there have been no reports of left ventricular inflow strangulation. Because this situation is rare and underappreciated, its recognition can be challenging. Pacing and lead function are not usually compromised. Serial posteroanterior

From the University of Utah, Division of Pediatric Cardiology, Primary Children's Hospital, Salt Lake City, Utah. The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the *JACC: Case Reports* [author instructions page](#).

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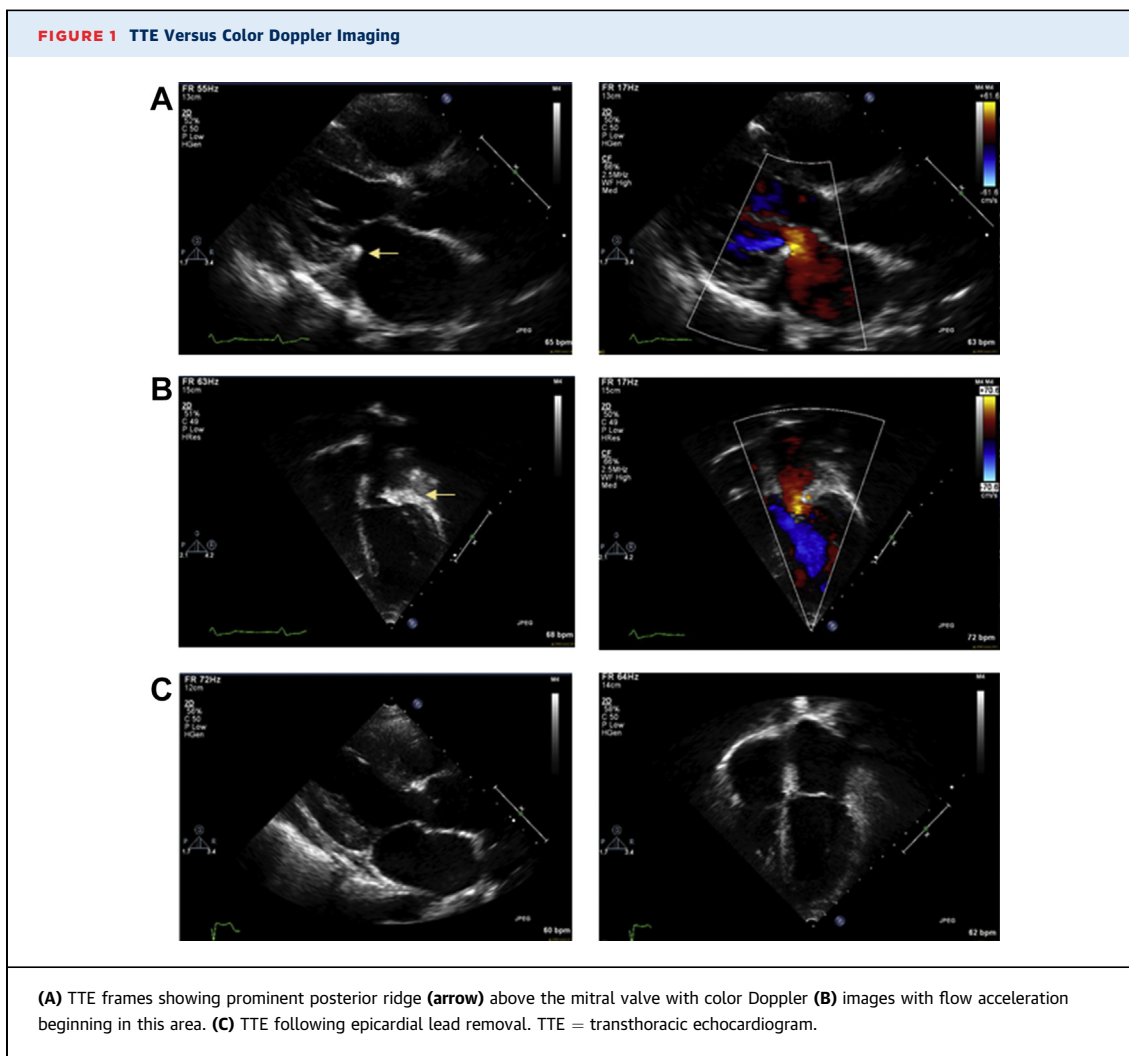
**ABBREVIATIONS  
AND ACRONYMS**

**PA** = posteroanterior

**TTE** = transthoracic  
echocardiogram

(PA) and lateral chest radiographs can be used to evaluate lead position in relation to the cardiac silhouette and changes in lead position that may occur with somatic growth (2).

In patients with epicardial pacing leads, physicians should be alert to new clinical signs and symptoms, echocardiographic findings, and electrocardiographic changes. Echocardiography can help confirm the diagnosis in cases of valvular disturbance but is unlikely identify coronary compression. The purpose of this report is to highlight the importance of TTE as it provides aids to identifying and monitoring for dynamic compression.



**ADDRESS FOR CORRESPONDENCE:** Dr. Juan Carlos Samayoa, Office at Primary Children’s Eccles Building, 81 North Mario Capecchi Drive, Salt Lake City, Utah 84113. E-mail: [juan.samayoa@hsc.utah.edu](mailto:juan.samayoa@hsc.utah.edu).

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complication. *J Thorac Cardiovasc Surg* 2015;149:522–47.

**KEY WORDS** atrial tachycardia, epicardial leads, lead strangulation, pacemaker, transthoracic echocardiogram

**APPENDIX** For supplemental videos and a figure, please see the online version of this paper.