

IMAGING VIGNETTE

ADVANCED

ECG CHALLENGE

# A Tale of 2 Nodes After Orthotopic Heart Transplant



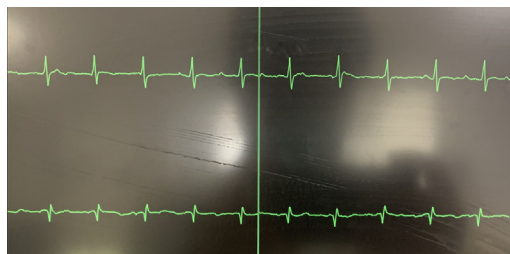
Sarine Beukian, AGACNP-BC,<sup>a</sup> Kiran Mahmood, MD,<sup>b</sup> Anelechi Anyanwu, MD,<sup>c</sup> Marc Miller, MD,<sup>b</sup> Aditya Parikh, MD<sup>b</sup>

## ABSTRACT

We report the case of a 30-year-old man who underwent orthotopic heart transplant via biatrial anastomosis technique. His post-operative electrocardiogram showed atrial dissociation, which is infrequently seen with newer surgical techniques in heart transplantation. (**Level of Difficulty: Advanced.**) (J Am Coll Cardiol Case Rep 2020;2:1849-51)  
© 2020 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 30-year-old man with Marfan syndrome, pectus excavatum, and mitral valve endocarditis, status post-bioprosthetic mitral valve replacement complicated by dehiscence, who underwent HeartWare ventricular assist device (Medtronic, Minneapolis, Minnesota) implantation, mitral valve replacement, and tricuspid valve repair in 2017. In March 2020, the patient underwent an orthotopic heart transplant via biatrial anastomosis technique and tricuspid valve repair. The ischemic time was 183 min. The post-operative course was complicated by a chyle leak requiring thoracic duct embolization. On post-operative day 45, after the removal of his epicardial leads, his telemetry monitoring showed complete heart block with narrow-complex rhythm (**Figure 1**). The patient had a temperature of 36.7°C, heart rate of 93 beats/min, blood pressure of 102/57 mm Hg, respiratory rate of 16 breaths/min, and peripheral oxygen saturation of 96% on room air. He was warm and euvolemic. An electrocardiogram was obtained (**Figure 2**).

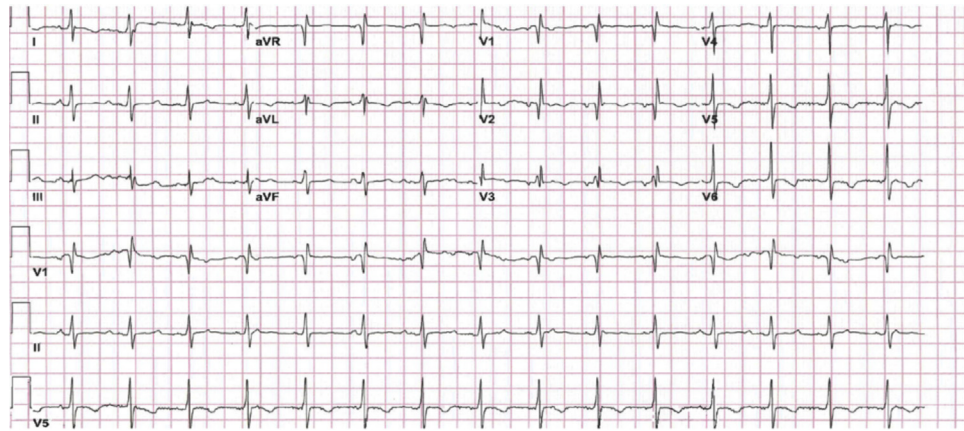
**FIGURE 1** Telemetry Monitor Suggesting Narrow-Complex Rhythm With Complete Heart Block



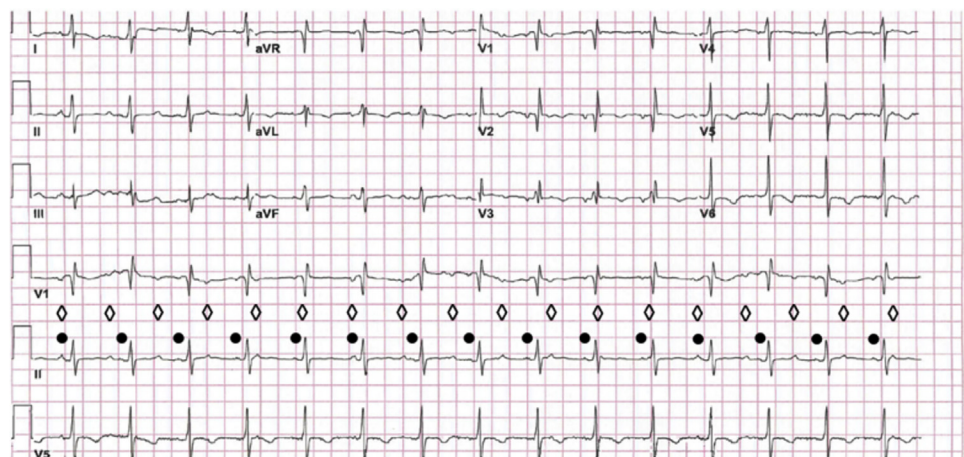
From the <sup>a</sup>Department of Advanced Heart Failure and Transplant, Mount Sinai Hospital, New York, New York; <sup>b</sup>Zena and Michael A. Wiener Cardiovascular Institute, Icahn School of Medicine at Mount Sinai, New York, New York; and the <sup>c</sup>Department of Cardiovascular Surgery, Icahn School of Medicine at Mount Sinai, New York, New York.

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](#).

Manuscript received May 12, 2020; revised manuscript received July 13, 2020, accepted July 27, 2020.

**FIGURE 2** Electrocardiogram on Postoperative Day 45 After Orthotopic Heart Transplant

The electrocardiogram demonstrates atrial dissociation with 2 distinct P-wave morphologies, from both the donor and native sinus nodes (Figure 3). Native sinus node activity is dissociated from the active rhythm. Distinguishing this from other atrial arrhythmias and, specifically, atrioventricular block is important, because the management is different. The patient underwent a heart transplant using the biatrial anastomosis technique, which involves suturing the donor right atrium to a portion of the native right atrium. This was done to displace the ventricles more laterally to the left and reduce the amount of compression on the right ventricle by his pectus excavatum after chest closure. In the biatrial technique, the native sinus node is frequently preserved but does not conduct to the transplanted donor heart because of disruption of blood supply and denervation. There is also conduction block across the suture line in the right atrium (1). Atrial dissociation after orthotopic heart transplant is not commonly seen these days because the bicaval anastomosis technique is considered a more preferable approach except under unique circumstances (2,3).

**FIGURE 3** The Electrocardiogram Demonstrates Atrial Dissociation With 2 P-Wave Morphologies, From Both the Donor and Native Sinus Nodes

## AUTHOR RELATIONSHIP WITH INDUSTRY

---

The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

---

**ADDRESS FOR CORRESPONDENCE:** Dr. Aditya Parikh, Division of Cardiology, Department of Medicine, Icahn School of Medicine at Mount Sinai, One Gustave L. Levy Place, Box 1030, New York, New York 10029. E-mail: [Aditya.Parikh@mountsinai.org](mailto:Aditya.Parikh@mountsinai.org).

---

## REFERENCES

1. Thajudeen A, Stecker EC, Shehata M, et al. Arrhythmias after heart transplantation: mechanisms and management. *J Am Heart Assoc* 2012;1:e001461.
2. Davies RR, Russo MJ, Morgan JA, et al. Standard versus bicaval techniques for orthotopic heart transplantation: an analysis of the United Network for Organ Sharing database. *J Thorac Cardiovasc Surg* 2010;140:700-8.
3. Weiss ES, Nwakanma LU, Russell SB, Conte JV, Shah AS. Outcomes in bicaval versus biatrial techniques in heart transplantation: an analysis of the UNOS database. *J Heart Lung Transplant* 2008;27:178-83.

---

**KEY WORDS** biatrial anastomosis, bicaval anastomosis, heart transplant