



Three-Dimensional Echocardiographic Assessment of Acquired Left Ventricular to Right Atrial Shunt (Gerbode Defect)

Kibar Yared, MD, FRCPC, Jorge Solis, MD, Jonathan Passeri, MD, Mary Etta E. King, MD, FACC, and Robert A. Levine, MD, FACC, *Boston, Massachusetts*

A 60-year-old man was readmitted 1 year after bioprosthetic aortic valve replacement for recurrent endocarditis. Transthoracic 2-dimensional color Doppler revealed a novel finding of a left-to-right shunt from the left ventricular outflow tract to the right atrium immediately superior to the septal leaflet of the tricuspid valve consistent with an acquired Gerbode defect. Real-time 3-dimensional echocardiography was used to accurately delineate the course of the shunt. To avoid overestimating right ventricular systolic pressure by mistaking such a shunt for an eccentric jet of tricuspid regurgitation, it is important to accurately differentiate the two. Real-time 3-dimensional echocardiography now provides rapid, detailed 3-dimensional appreciation of the origin and course of such shunts with easy facility of orienting views to the flows of interest by cropping. Such information can help design optimal surgical or catheter-based therapy. (*J Am Soc Echocardiogr* 2009;22:435.e1-e3.)

Keywords: Aortic valve replacement, Gerbode defect, Three-dimensional echocardiography

A 60-year-old man underwent bioprosthetic aortic valve replacement for infective endocarditis and was readmitted 1 year later for recurrent endocarditis. Transthoracic 2-dimensional color Doppler revealed a novel finding of a left-to-right shunt from the left ventricular outflow tract to the right atrium immediately superior to the septal leaflet of the tricuspid valve (Figure 1), consistent with an acquired Gerbode defect. No evidence of paravalvular abscess was found.

To further define shunt anatomy, real-time 3-dimensional echocardiography (Philips iE33, Andover, MA) was performed. Color full-volume images were cropped (Figure 2, Video 1) to demonstrate flow acceleration within the left ventricular outflow tract and extension of flow across the atrioventricular septum into the right atrium at the base of the septal tricuspid valve leaflet (Figure 3, Video 2).

To avoid overestimating right ventricular systolic pressure by mistaking such a shunt for an eccentric jet of tricuspid regurgitation, it

is important to accurately differentiate the two. Real-time 3-dimensional echocardiography now provides rapid, detailed 3-dimensional appreciation of the origin and course of such shunts with easy facility of orienting views to the flows of interest by cropping.^{1,2} Such information can help design optimal surgical or catheter-based therapy.

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From the Division of Cardiology, Massachusetts General Hospital, Harvard Medical School, Boston, Massachusetts (K.Y., J.S., J.P., M.E.E.K., R.A.L.).

Reprint requests: Kibar Yared, MD, Massachusetts General Hospital, Harvard Medical School, 55 Fruit St, Yawkey 5E, Boston, MA 02114. (E-mail: kyared@partners.org).

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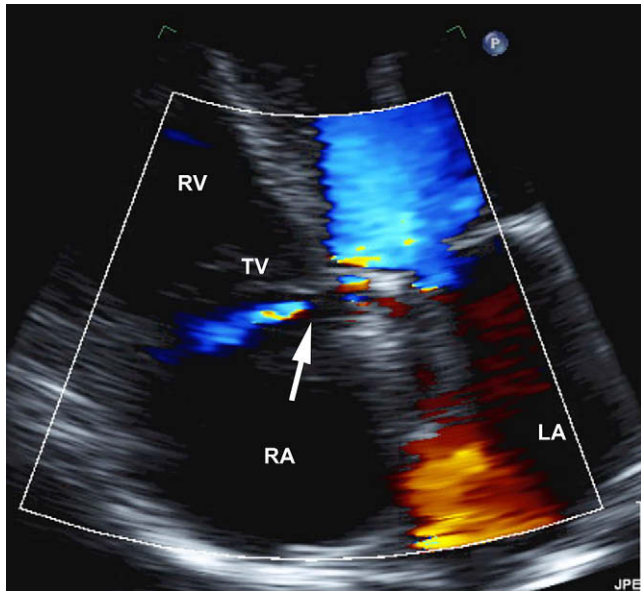


Figure 1 Two-dimensional echocardiography with color Doppler interrogation in apical 4-chamber view demonstrating left ventricular outflow tract to right atrial shunting (*arrow*). *RV*, Right ventricle; *RA*, right atrium; *LA*, left atrium; *TV*, tricuspid valve.

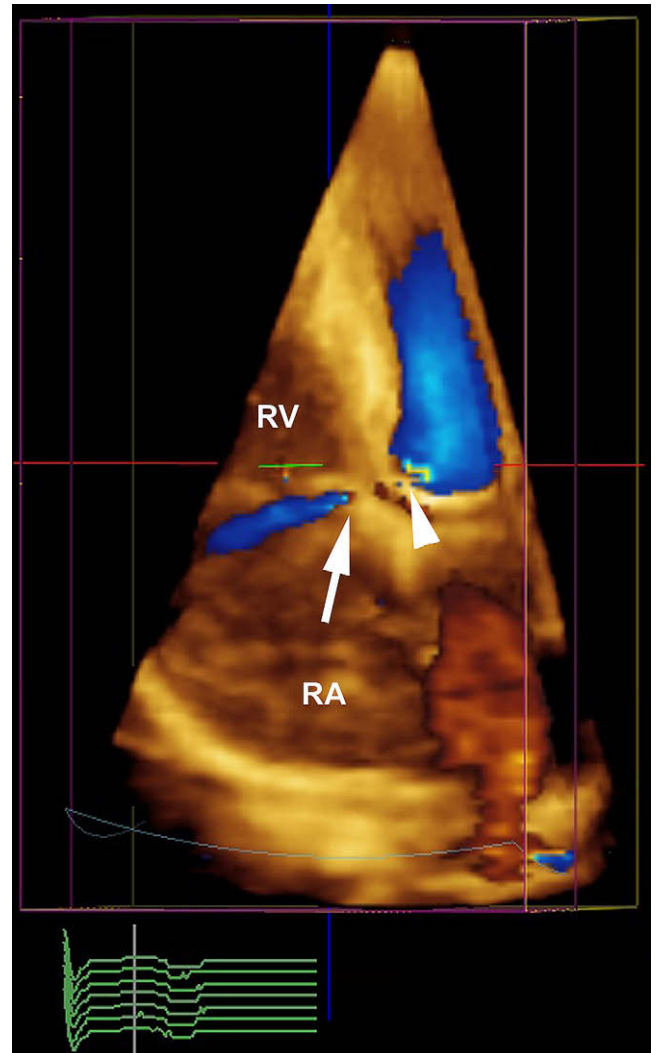


Figure 2 Three-dimensional echocardiography with color Doppler interrogation in apical 4-chamber view demonstrating left to right shunting (*arrow*) and flow acceleration at the beginning of the jet (*arrowhead*). *RV*, Right ventricle; *RA*, right atrium.

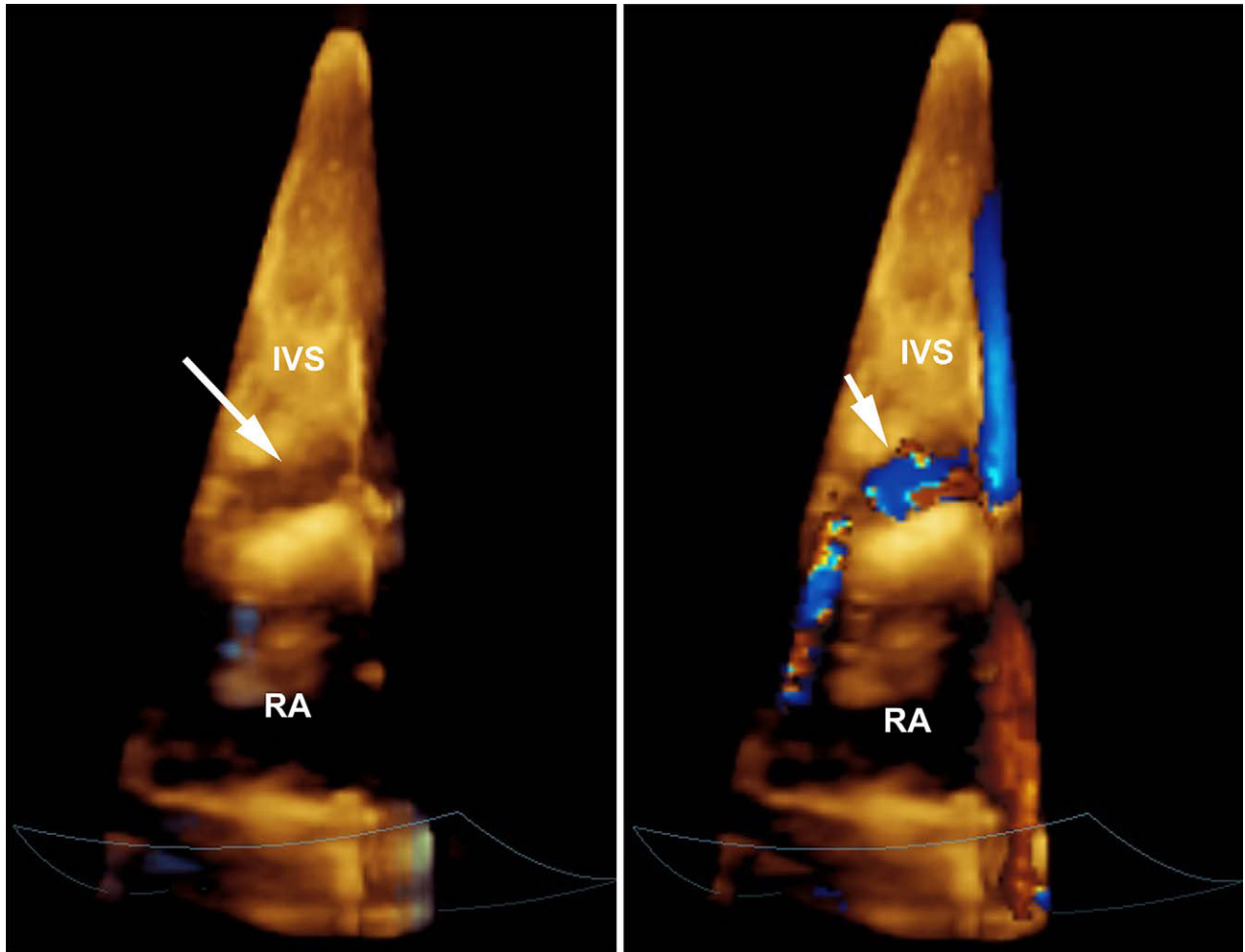


Figure 3 Three-dimensional echocardiography with (*right*) and without (*left*) color Doppler interrogation. Manual cropping of a full-volume acquisition enables proper visualization of the extent of the defect (*long arrow*). Accurate delineation of the defect is then further achieved with the aid of color Doppler (*short arrow*). *IVS*, Interventricular septum; *RA*, right atrium.