

(EP08.96). SlowflowHD in the Outflow Tract Coronal View for First-Trimester Screening and Differential Diagnosis of Complex Congenital Heart Disease: A Novel Approach

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Objectives

To introduce a method using two-dimensional ultrasound combined with SlowflowHD to assess the severity of congenital heart disease (CHD) in the first trimester, and to evaluate the feasibility of this method for the differential diagnosis of conotruncal anomalies.

Methods

Between January 2021 and December 2025, cases undergoing first-trimester nuchal translucency screening were enrolled at the PKUFH-NINGXIA Women & Children's Hospital. Structural normality was defined by: symmetrical filling of the left and right ventricular cavities, absence of abnormal interventricular flow, continuity between ventricular chambers and outflow tracts, and normal orientation, course, and filling of the great arteries. CHD with four-chamber structural abnormalities was diagnosed when there was asymmetry in ventricular filling accompanied by abnormal high-velocity interventricular flow. Outflow tract CHD was

diagnosed when there was misalignment or overriding of outflow tracts with ventricular chambers, absence of crossing outflow tract flow, or abnormal filling. Diagnosis and classification of CHD were confirmed by echocardiography and/or autopsy in the second trimester or postnatally.

Results

A total of 165 cases were diagnosed with CHD in the first trimester, including 78 simple CHD and 87 complex CHD. Of the 87 complex CHD cases, 83 were confirmed correct by prenatal diagnosis, yielding a sensitivity of 82.47% and specificity of 99.74% in this high-risk cohort.

Conclusion

The SlowflowHD outflow tract coronal view with the “∞-shaped” flow pattern is an effective method for first-trimester screening of CHD and for the differential diagnosis and severity assessment of conotruncal anomalies. This approach facilitates early fetal cardiac prognostic grading and optimizes prenatal counseling.

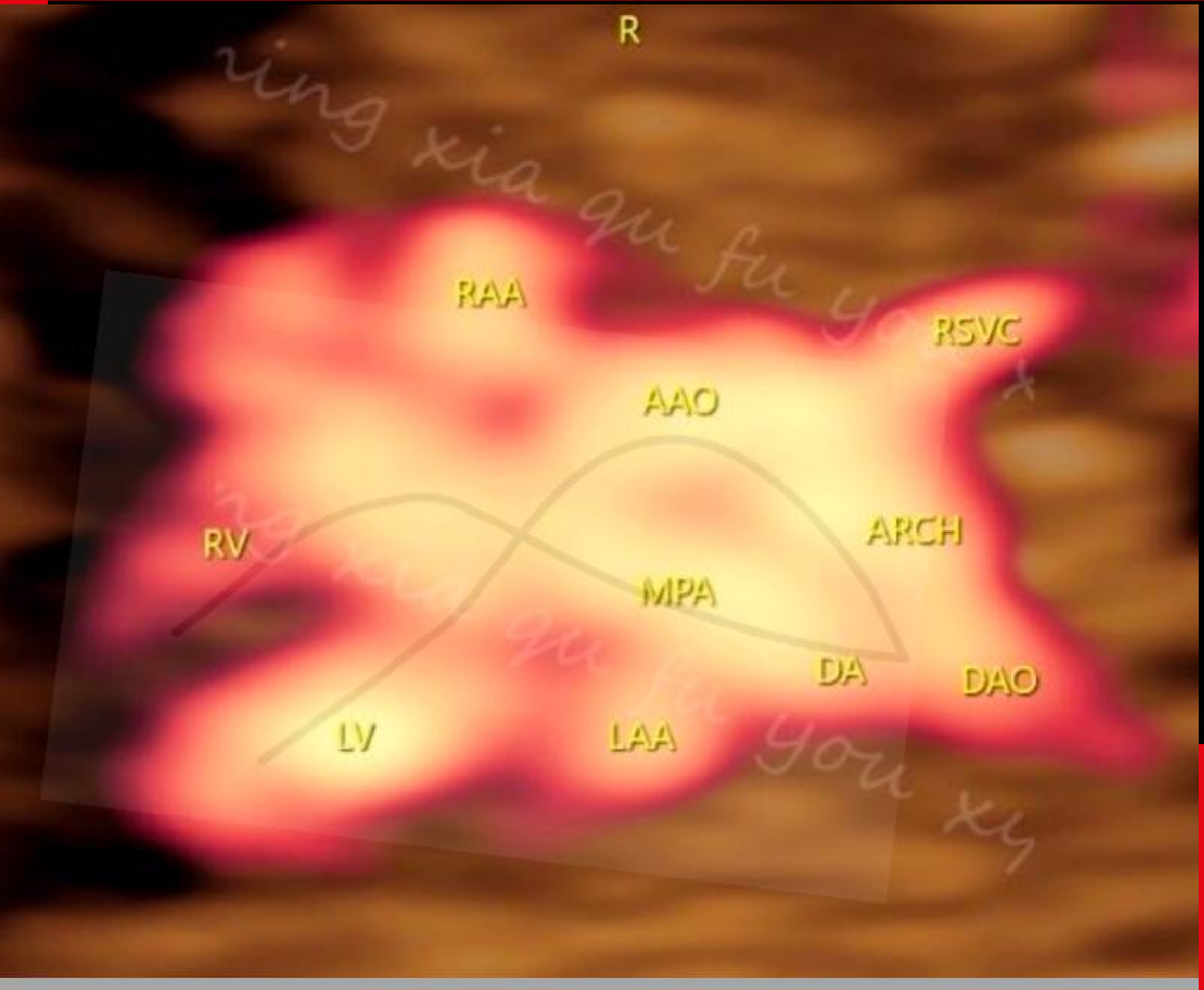


Figure 1. The SlowflowHD outflow tract coronal view with the “∞-shaped” flow

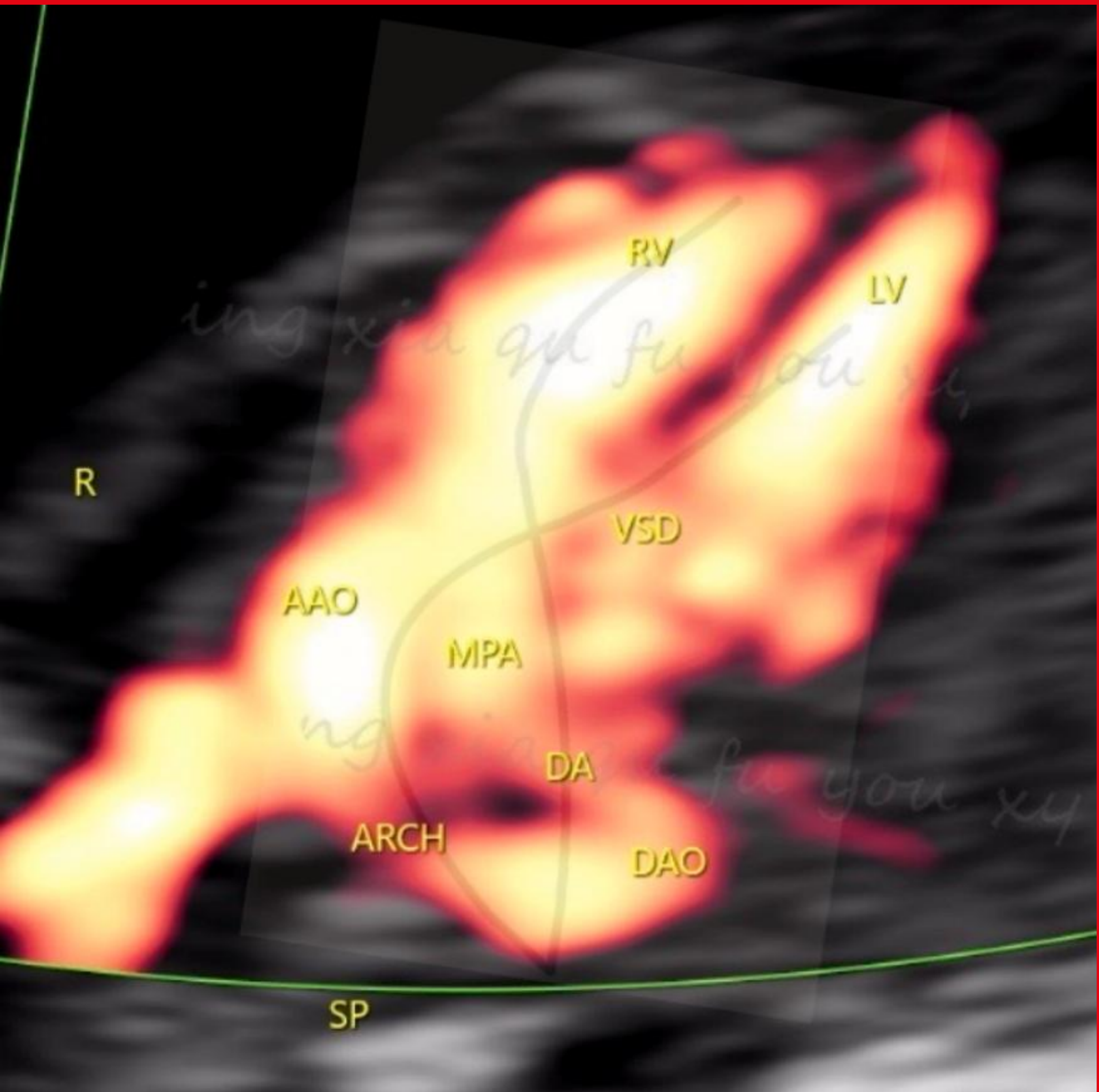


Figure 2. DORA