

# Infective endocarditis occurs simultaneously in the native aortic valve and ductus arteriosus

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## Abstract

A 45-year-old man presented with complaints of intermittent fever and chest pain for 3 weeks. He had a 30-year history of patent ductus arteriosus (PDA). Transthoracic- echocardiography (TTE) and transesophageal echocardiography (TEE) successfully diagnosed aortic vegetations and cast-type PDAs, but additional PDA terminal vegetations were found TEE, and PDA vegetations were also found in coronary CT. Multi model imaging has important value for its accurate diagnosis and treatment.

- 1.Hospital exempted from ethics review in view of retrospective cases.
- 2.The patient agreed to have her anonymized clinical data published in this report.
- 3.All authors have read and approved submission of the manuscript and have no conflict of interest to disclose.
- 4.we disclosed no funds and financial support.

Infective endocarditis occurs simultaneously in the native aortic valve and ductus arteriosus

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The first two authors are co-first authors. All authors disclosed no relevant relationships.

Data Availability Statement:The data that support the findings of this study are available from the corresponding author.

## Abstract

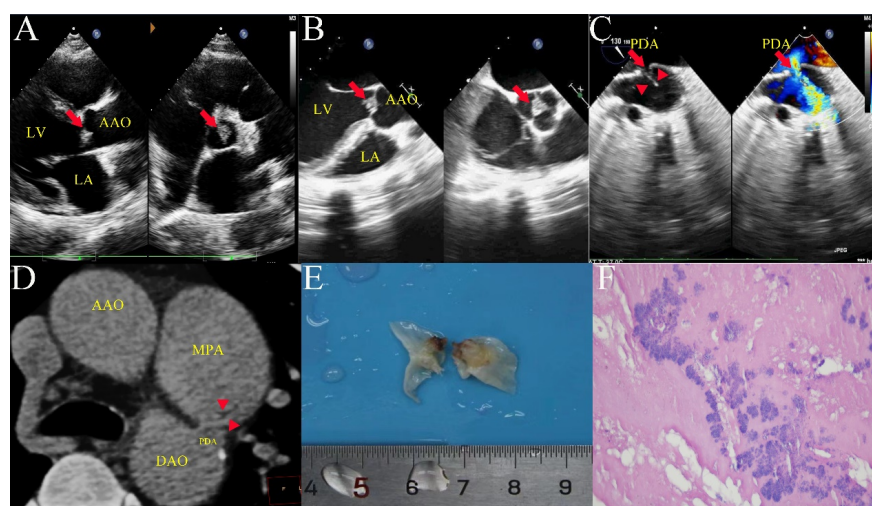
A 45-year-old man presented with complaints of intermittent fever and chest pain for 3 weeks. He had a 30-year history of patent ductus arteriosus (PDA). Transthoracic- echocardiography (TTE) and transesophageal echocardiography (TEE) successfully diagnosed aortic vegetations and cast-type PDAs, but additional PDA terminal vegetations were found TEE, and PDA vegetations were also found in coronary CT. Multi model imaging has important value for its accurate diagnosis and treatment.

## KEYWORDS

infective endocarditis, patent ductus arteriosus, transthoracic echocardiography, Transesophageal echocardiography, multi model imaging

A 45-year-old man presented with complaints of intermittent fever and chest pain for 3 weeks. He had a 30-year history of patent ductus arteriosus (PDA). He was treated with ceftriaxone in combination with gentamicin outside the hospital for 7 days. Physical examination revealed a continuous systolic murmur at the second left intercostal space. Blood cultures suggested positive findings of *Streptococcus* spp. Clinical diagnosis of infective endocarditis (IE) based on modified Duke criteria.<sup>1</sup> Transthoracic echocardiography (TTE) showed a tubular PDA with a diameter of 7mm, and hyperechoic tissue attached to the native aortic valve (16X13mm) (Panel A), moderate to severe aortic regurgitation. Transesophageal echocardiography (TEE) demonstrated a nodular hyperechoic tissue located on the aortic valve (Panel B, Videos S1–S2) and a tubular-type PDA with a cord-like structure located on the PA end of ductus (5mm) (Panel C, Videos S3). Because of the patient's elevated D-dimer (1.17ug/ml) (normal value 0.00-0.85ug/ml), we continued to perform pulmonary vascular CT to rule out pulmonary embolism. CT also demonstrated a strip-like hypodense structure attached to one side of the PDA (panel D) and ruled out pulmonary embolism. The patient underwent resection of vegetations on the aortic valve and PDA, ligation of PDA, aortic valve replacement. Postoperative pathology confirmed that this structure was vegetations (Panels E and F). The postoperative course was uneventful and discharged after 1 week.

Infectious endocarditis-related vegetations occur simultaneously both aortic valve and PDA is particularly rare, to our knowledge, it is easily underdiagnosed or misdiagnosed. Although TTE is the gold standard for diagnosis of infective endocarditis vegetations, there are still challenges in the diagnosis of unusual location sites and small vegetations. Multi model imaging has important value for its accurate diagnosis and treatment.<sup>2</sup>



**Figure1.**

Transthoracic echocardiography (Panel A), Transesophageal echocardiography (Panel B, C), Pulmonary vascular CT (Panel D), Postoperative pathology (Panel E, F)

Transthoracic ultrasound and transesophageal discovery of aortic valve vegetations were successful (Panel A,B, red arrow). Transesophageal ultrasound additionally confirmed cord-like vegetations at the end of PDA (Panel C, red arrow and triangle). Pulmonary vascular CT confirmed that small strips of vegetation adhered to the end of PDA (Panel D, triangle). Postoperative pathology (Panel E, F). AAO = aorta; LA = left atrium; LV = left ventricle; PDA = patent ductus arteriosus; MPA = main pulmonary artery

## video legends

Videos S1. TEE short axis aortic valve vegetations:



Ultrasound images through the middle of the esophagus revealed that the short-axis view of the aortic valve showed that the aortic valve was trilobated aortic valve, with a thickened leaflet and a slightly hyperechoic mass attached (Size approx.16X13mm).

Videos S2.TEE long axis aortic valve vegetations:

Ultrasound images through the middle of the esophagus showed thickening of the aortic valve and attachment of a slightly hyperechoic mass in the long-axis view of the left ventricle, which oscillated with the heart cycle.

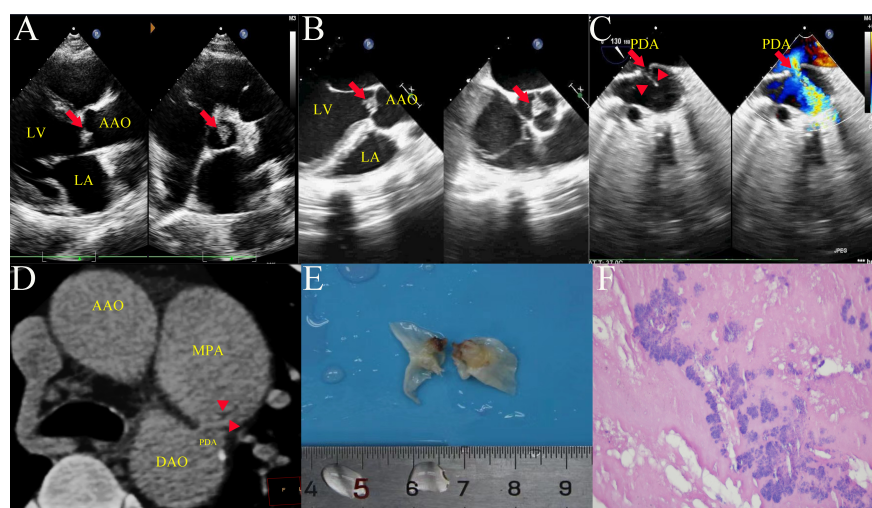
Videos S3.TEE of PDA vegetations:

In the long-axis view of the descending aorta, two-dimensional ultrasound (right) showed a 7mm wide PDA and a cord-like structure swinging sharply at the position of the ductus arteriography in the pulmonary artery. Color Doppler (left) showed a continuous shunt signal from the descending aorta to the pulmonary artery.

## References:

Li J.S. Sexton D. J.Mick N.et al. Proposed modifications to the Duke criteria for the diagnosis of infective endocarditis. Clin Infect Dis. 2000; 30: 633-638.

Gomes A, Glaudemans AWJM, Touw DJ, et al. Diagnostic value of imaging in infective endocarditis: a systematic review. [J]. Lancet Infect Dis,2017,1:e1-e14.



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Videos S1.TEE short axis aortic valve vegetations.avi available at <https://authorea.com/users/490914/articles/638731-infective-endocarditis-occurs-simultaneously-in-the-native-aortic-valve-and-ductus-arteriosus>

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