Images in Cardiology

Transillumination Rendering of a Prosthetic Mitral Valve Endocarditis

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A 61-year-old man presented in mid-2019 to the emergency department complaining of high-grade fever, chills, and malaise 4 days before his visit. He had a history of hypertension and a biological mitral valve replacement in 2016 as treatment for a severe mitral regurgitation. Cardiac auscultation and physical examination were noncontributory. A late endocarditis of the prosthetic mitral valve was suspected. Hemocultures taken in the first hour were positive for *Streptococcus viridans* and *S. pneumoniae*.

Transthoracic echocardiography showed images suggestive of endocarditis in the prosthetic mitral valve, but vegetations were not clearly visualized and identified. Conventional 3D transesophageal echocardiography (TEE) identified the vegetation in the auricular view of the prosthetic mitral valve (Fig. 1A; Video 1 view video online). TEE 3D colour Doppler and transillumination rendering (Fig. 1, B and C; Videos 2 and 3 view videos online) enhanced the details and depth of the prosthetic mitral valve endocarditis and clearly identified the vegetations in the auricular side of the prosthesis, as well as a previously unidentified perforation in the posterior leaflet.

Treatment with vancomycin and ceftriaxone IV was initiated, and the patient underwent surgery for a mitral valve biological prosthesis replacement a week later during the same hospitalization. The presence of perforations in the posterior mitral leaflet as well as the vegetations previously identified by the transillumination rendering and 3D colour Doppler was confirmed during the removal of the infected prosthesis. During surgery, the presence of multiple vegetations in the auricular side of the prosthetic mitral valve was identified, and the presence of the perforation was confirmed. An excellent correlation between the removed prosthetic mitral valve and

Novel Teaching Points

- Transillumination rendering is a novel 3D echocardiographic technique that allows a more detailed characterization of cardiac structures.
- The association of transillumination rendering with conventional echocardiographic techniques allows a more comprehensive study of common clinical scenarios.
- In this case, the use of transillumination rendering allowed the identification of a previously undetected mitral leaflet perforation and changed the management of this patient.

the images acquired with the transillumination rendering technique was found (Fig. 1. D).

The patient was discharged with oral antibiotics after a week of treatment with a weekly follow-up in the out-patient clinic for 2 months. A transthoracic echocardiography was performed in each visit to visualize the new mitral valve prosthesis. No residual regurgitation was identified, and the patient was discharged without complications.

Transillumination rendering is a new 3D echocardiographic rendering technique that allows a better characterization of depth and details compared with the conventional 3D rendering. It allows the enhancement of orifices, borders, cavities, cardiac masses, and structural abnormalities.^{1,2} In this case, the identification of the leaflet perforation was a pivotal finding in the management of the patient as a new mitral valve replacement was proposed with this new information, which would have not been decided if only conventional 3D TEE were performed. This case portrays the use of a novel echocardiographic technique in conjunction with conventional 3D colour Doppler in a common clinical scenario and shows the diagnostic potential of this new asset in clinical decision-making.

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See page 556 for disclosure information.

Figure 1. (A) Three-dimensional transesophageal echocardiography of the prosthetic mitral valve endocarditis from the atrial perspective. No perforation is identified with this technique. (B) Transillumination rendering from the atrial perspective clearly showing a perforation site in one of the leaflets (**white arrow** points to perforation). (C) 3D colour Doppler corroborated the site of the leaflet perforation (**white arrow** points to the regurgitation jet). (D) Surgical piece of the removed prosthetic mitral valve. Multiple vegetations and perforated leaflet (**white arrow** points to perforation). Findings greatly correlated with images from the transesophageal echocardiography transillumination rendering technique.

Disclosures

The authors have no conflicts of interest to disclose.

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Supplementary Material

To access the supplementary material accompanying this article, visit *CJC Open* at <https://www.cjopen.ca/> and at <https://doi.org/10.1016/j.cjco.2020.12.003>.