Simultaneous Visualization of 2 Intracardiac Masses in Both Atria on 3-Dimensional Transesophageal Echocardiography

Kanako Imamura, MD; Masaaki Takeuchi, MD; Nobuhiko Haruki, MD; Kyoko Kaku, MD; Hidetoshi Yoshitani, MD; Eiji Yamashita, MD; Shinjou Sonoda, MD; Kuninobu Kashiwama, MD; Toshiyuki Ota, MD; Yutaka Otsuji, MD

Figure 1. 2-dimensional (D) and 3-D visualization of intracardiac masses before (Upper panels) and after (Lower panels) intensive anticoagulation treatment. (A) Left atrial appendage (LAA) mass (arrows); (B) enface view of LAA mass extracted from 3-D zoom datasets (arrows) looking from the left atrium; (C) short axis view of the aortic valve showing a small mass in the right atrium before treatment; (D) cropped 3-D zoom datasets clearly depicting this mass (arrows) attached to the surface of the pacemaker lead (asterisks). Note both masses reduced in size after anticoagulation therapy. LUPV, left upper pulmonary vein; LV, left ventricle; RVOT, right ventricular outflow tract; TV, tricuspid valve.

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Second Department of Internal Medicine, University of Occupational and Environmental Health, School of Medicine, Kitakyushu, Japan

Mailing address: Masaaki Takeuchi, MD, Second Department of Internal Medicine, University of Occupational and Environmental Health, School of Medicine, 1-1 Iseigaoka, Yahatanishi-ku, Kitakyushu 807-0855, Japan.  E-mail: takeuchi@med.ueoh-u.ac.jp


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Accurate determination of intracardiac thrombus is essential for timely management and to prevent future systemic and pulmonary embolizations. 3-dimensional (D) transesophageal echocardiography (TEE) has the potential to achieve this.

An 80-year-old woman with a previous history of mitral valve repair due to flail P3 prolapse and dual-pacing, dual-chamber, dual-response (DDD) pacemaker implantation due to sick sinus syndrome was admitted to hospital because of recurrent congestive heart failure. Although 2-D transthoracic echocardiography showed newly developed wall motion abnormality in the apical segment with reduced left ventricle systolic function, coronary angiography showed no significant stenosis or occlusion. Because the electrocardiogram showed pacing rhythm, there was no definite ischemic change. Additionally, pacemaker record showed previous frequent atrial fibrillation. Prior to admission, substantial diuretics were used for heart failure and the patient had not been taking warfarin. To evaluate the repaired valve and left atrium thrombus, the patient was referred for TTE. The repaired mitral valve with a rigid ring did not show stenotic change, or recurrence of mitral regurgitation. However, dilated left atrium and left appendage (LAA) with moderate spontaneous echo contrast were observed. On 2-D imaging at the level of the left atrium and mitral valve, a large thrombus was found in the LAA (Figure 1 Upper A). Its bullet-like shape and relation to the surrounding structures were easily observed on the cropped image obtained from 3-D zoom datasets (Figure 1 Upper B). LAA emptying velocity was severely decreased. On 2-D short-axis imaging of the aortic valve, another small mobile mass was incidentally found in the right atrium (Figure 1 Upper C). Cropped 3-D zoomed imaging verified that this mass was attached to the pacemaker lead directed toward the lower interatrial septum (Figure 1 Upper D). Cropped 3-D full-volume datasets allowed simultaneous visualization of the 2 masses in both atria during 1 cardiac cycle (Figure 2 Upper panel; Movie 1). Because intracardiac thrombi in both atria were strongly suspected, intensive anticoagulation treatment with warfarin was started (international normalized ratio: 2.5–3.5). Several etiologies of thrombus formation were considered. Diuretic usage (hemoconcentration) and lack of anticoagulation treatment may accelerate thrombus formation. We performed a second 3-DTEE 3 months after the first examination. Although both masses had significantly reduced in size (Figure 1 Lower A–D), they had not completely disappeared, and were more clearly depicted on 3-D imaging (Figure 2B; Movie 2).

2-D TEE is an established technique for the diagnosis of intracardiac thrombus, especially when located in the left atrium.14 2-D evaluation for the exact location of small thrombusthe...
bus and its relationship to the surrounding native structures or artificial materials observed in the present case is sometimes difficult, because limited transducer manipulation in the esophagus precludes full visualization of abnormal findings. 3-DTEE allows volumetric data acquisition for specific cardiac pathologies, from which the abnormalities can be extracted at any cutting plane, resulting in accurate and reliable evaluation. Simultaneous visualization of multiple abnormalities in a relatively wide area of interest is another advantage of 3-DTEE that provides better understanding of these pathologies in 3-D space. Finally, 3-D datasets obtained at different examinations allow generation of the same cutting view, which facilitates easy comparison of the change in specific pathology between serial recordings. Although differential diagnosis of the mass in the right atrium includes thrombus, vegetation and tumor, and direct pathological specimens were not obtained in the present case, the reduction in the size of both masses after anticoagulation treatment raises the strong possibility that both masses were intracardiac thrombi.

References


Supplemental Files

Supplemental File 1
Movie 1. First examination.
Supplemental File 2
Movie 2. Second examination.

Please find supplemental file(s): http://dx.doi.org/10.1253/circj.CJ-10-0798