THE ANATOLIAN JOURNAL OF CARDIOLOGY

Official journal of the TURKISH SOCIETY OF CARDIOLOGY

Spontaneous Echo Contrast or Thrombus? Intracardiac Echocardiography and Isoproterenol Infusion Provide the Answer

A 77-year-old man with heart failure and chronic kidney disease presented with dyspnea and palpitations. Atrial fibrillation (AF) was documented, and catheter ablation was planned. Pre-procedural transesophageal echocardiography demonstrated a calcified echogenic structure located within the mid-portion of the left atrial appendage (LAA). The appendage appeared patent up to this level; however, the distal portion could not be clearly delineated. The region beyond the echogenic structure resembled the transverse sinus but did not demonstrate the typical anechoic appearance expected for the transverse sinus and contained SEC-like swirling echoes. Consequently, it remained unclear whether this area represented the distal LAA or the pericardial transverse sinus, rendering TEE inconclusive for reliable assessment of LAA anatomy and thrombus exclusion (Figure 1; Video 1).

Given the inconclusive transesophageal findings, further evaluation with intracardiac echocardiography (ICE) was done. Initial imaging from the pulmonary artery provided improved delineation of the LAA anatomy, demonstrating a relatively shallow appendage surrounded by a prominent transverse sinus space. Despite the clearer anatomical visualization, a large, echogenic, mass-like appearance within the LAA raised persistent concern for thrombus formation (Figure 2A and 2B; Video 2A and 2B). Therefore, additional functional assessment was required to differentiate the true thrombus from the dense spontaneous echo contrast.

Transseptal access was subsequently obtained under ICE guidance using a no-touch technique. The ICE catheter was inserted into the left atrium and positioned in the left superior pulmonary vein to obtain dedicated views of the LAA. From this vantage point, integration of the appendage again demonstrated a large, echogenic, mass-like appearance, maintaining a strong suspicion for thrombus, and

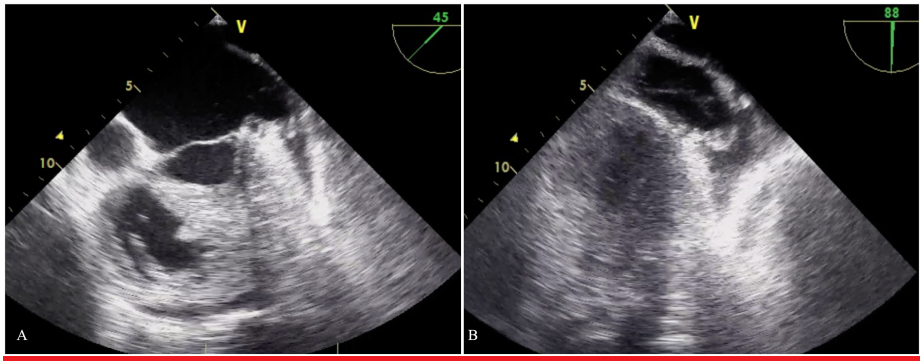


Figure 1. Transesophageal echocardiography of the left atrial appendage. (A) View at 45° demonstrating dense echogenic material within the left atrial appendage. (B) View at 88° confirming persistent echogenic appearance suspicious for spontaneous echo contrast versus thrombus.

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Available Online Date: August 3, 2026

Cite this article as: Sezer C, Çöteli C, Kılıç GS, Canpolat U, Yorgun H, Aytemir K. Spontaneous Echo Contrast or Thrombus? Intracardiac Echocardiography and Isoproterenol Infusion Provide the Answer. *Anatol J Cardiol.* 2026;30(10):E-24-E-25.

DOI: 10.14744/AnatolJCardiol.2026.6791

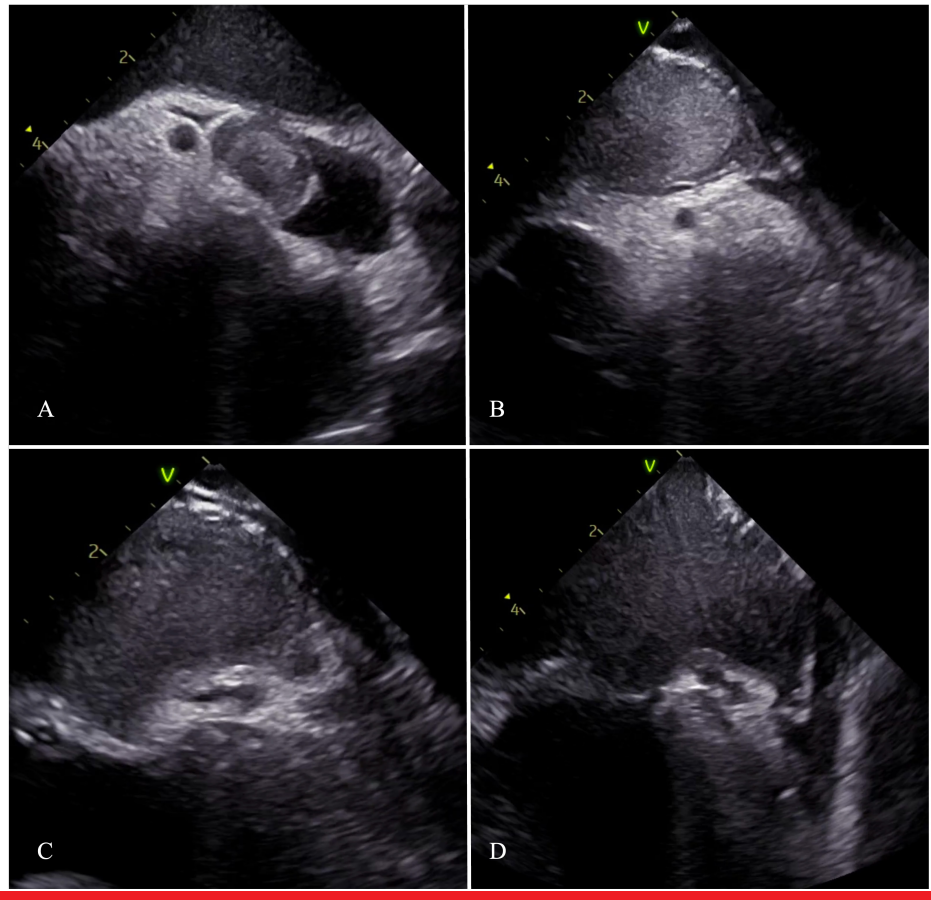


Figure 2. Intracardiac echocardiographic evaluation of the left atrial appendage. (A) Right atrial view demonstrating a globular echogenic structure within the left atrial appendage. (B) Left atrial view after transseptal access providing improved delineation. (C) During isoproterenol infusion, dispersion of spontaneous echo contrast is observed. (D) After isoproterenol infusion, resolution of spontaneous echo contrast.

cancellation of the ablation procedure was initially considered. As a final diagnostic maneuver, isoproterenol infusion was initiated to differentiate thrombus from dense SEC. Following adrenergic stimulation, the echogenic material within the LAA rapidly and completely dispersed, confirming the diagnosis of dense SEC and effectively excluding thrombus (Figure 2C and 2D; Video 2C and 2D). Therefore, catheter ablation was continued safely.

Informed Consent: Written informed consent was obtained from the patient for the publication of this case and the accompanying images.

Declaration of Interests: The authors have no conflict of interest to declare.

Funding: The authors declared that this study has received no financial support.

Video 1: Transesophageal echocardiographic imaging of the left atrial appendage at 65° demonstrating dense echogenic material.

Video 2: Intracardiac Echocardiography With Pharmacologic Provocation. (A) Intracardiac echocardiographic view from the right atrium. (B) Left atrial view after transseptal access. (C) Dispersion of spontaneous echo contrast during isoproterenol infusion. (D) Resolution of spontaneous echo contrast after isoproterenol infusion.