

Prominent Mobile Crista Terminalis: A Right Atrial Pitfall

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ABSTRACT

Intraprocedural rotational intracardiac echocardiography by Ultra ICE allowed qualitative information consistent with a prominent mobile Crista Terminalis. The correct diagnosis of this right atrial pitfall zeroed the risk to mistake it for tumors or thrombi, avoiding needlessly costly additional investigations.

Main Text

A 39 years-old female, severe aura migraineur, past history of fibromyalgia and minor thrombophilic disorder (MTHFR mutation C677T), suffered from an unexplained ischemic stroke with positive neuroimaging. Transthoracic echocardiography confirmed the presence of tunnel-like patent foramen ovale (PFO) without atrial septal aneurysm or Eustachian valve. Contrast-enhanced transcranial Doppler was positive for severe right-to-left shunt via PFO. Following discussion in the heart & brain team, catheter-based PFO closure was planned. After local anaesthesia and mild sedation, closure procedure was routinely performed under fluoroscopic monitoring and rotational intracardiac guidance by the mechanical 9F/9 MHz 360° scan probe (Figure 1, A) (Ultra ICE™, EP Technologies, Boston Scientific Corporation, CA, USA). Pre-procedural long-axis four-chamber plane Ultra ICE evaluation showed unexpectedly a round mass as a prominent ridge localized at the posterolateral region of the right atrium mimicking a thrombus or a tumor (Supplementary Video S1). Good acoustic contrast between soft tissue structures obtained by Ultra ICE™ technology allowed qualitative information consistent with a prominent Crista Terminalis (CT) (Figure 1, B-C) (1-4). Post-procedural axial plane Ultra ICE (Figure 2 A-B, Supplementary Video S2) confirmed the correct device position without interference

with CT and the abolition of the shunt (Supplementary Video S3). A correct diagnosis of the prominent mobile CT will minimize the risk to mistake it for tumors or thrombi, avoiding needlessly costly additional investigations.

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Figures Legend

Figure 1. Rotational Intracardiac Echo by Ultra-ICE. **A:** mechanical 9F/9 MHz 360° scan probe and iLAB Ultrasound Imaging System; **B-C:** pre-procedural long-axis four-chamber plane showing the interatrial septum longitudinally scanned and the fossa ovalis with its inferior–anterior and superior–posterior rims. The Crista Terminalis (orange arrow) appears as a bright thick structure, located at the junction between the posterior smooth wall and the anterolateral trabeculated portion of the right atrium.

Right upper pulmonary vein (RUPV), right atrium (RA), left atrium (LA), tricuspid valve (TV), superior–posterior rim (SP rim), inferior–anterior rim (IA rim), septum primum (S1), Ultra ICE catheter is at the center of the image (yellow arrowhead).

Figure 2. A-B: post-procedural axial plane showing the right atrial cavity, tricuspid valve and the correctly positioned Occlutech Figulla Flex II PFO device (red asterisk). The prominent Crista Terminalis is shown (orange arrows) keeping partial contact with the Ultra ICE catheter (yellow arrowhead) but without interference with the device.

right atrium (RA), left atrium (LA), RA, right atrium, right atrial appendage (RAA), tricuspid valve (TV).

SUPPORTING INFORMATION

Movie S1. Rotational Intracardiac Echo by the mechanical 9F/9 MHz 360° scan probe.

Pre-procedural long-axis four-chamber plane Ultra ICE evaluation showed a round mass as a prominent ridge localized at the posterolateral region of the right atrium.

Movie S2. Rotational Intracardiac Echo by the mechanical 9F/9 MHz 360° scan probe.

Post-procedural axial plane Ultra ICE confirmed the correct device position without impingement/interference with prominent Crista Terminalis.

Movie S3. Rotational Intracardiac Echo by the mechanical 9F/9 MHz 360° scan probe

Post-procedural axial plane contrast-enhanced (agitated saline) Ultra ICE confirmed abolition of the right-to-left shunt.