

Less is more: X-ray–TEE fusion with a new mini probe

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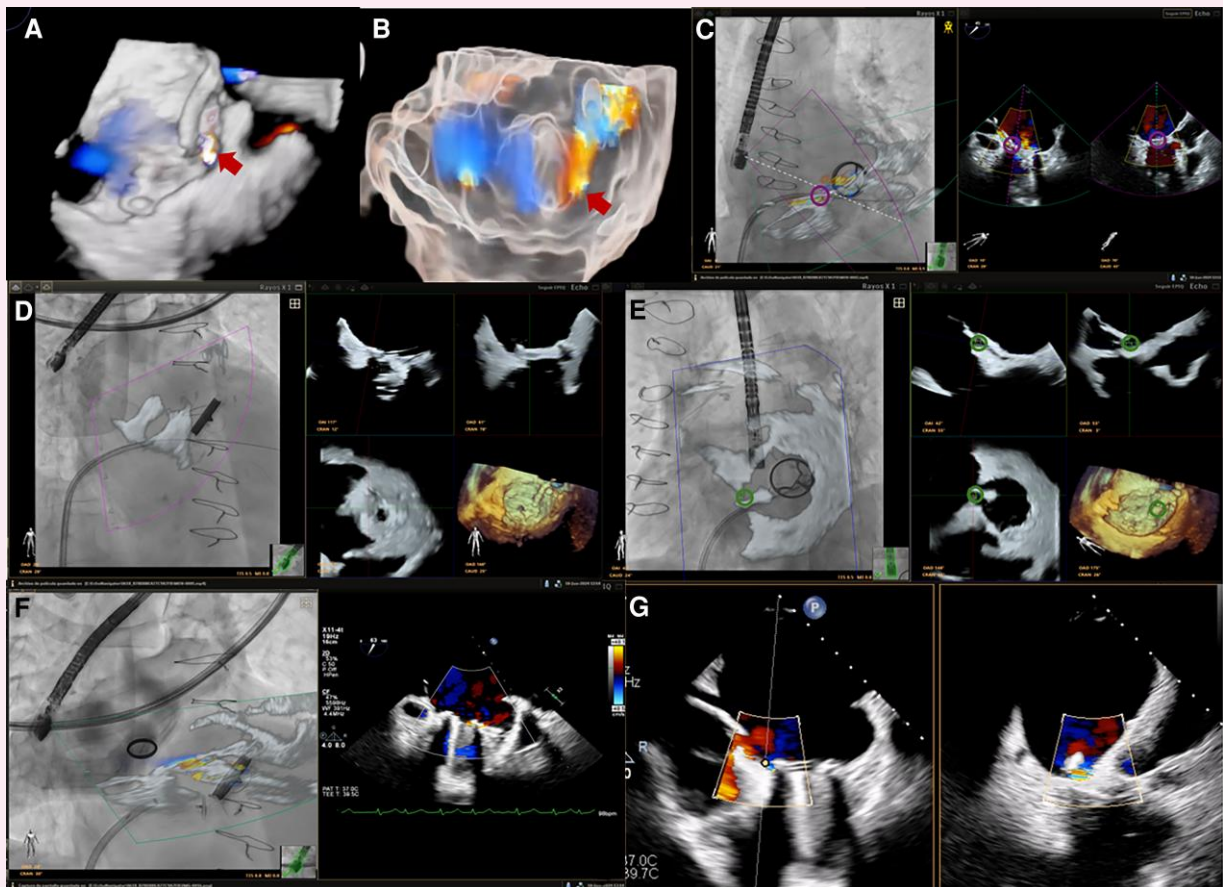
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Transoesophageal echocardiography (TEE) is essential during most percutaneous cardiac interventions. Traditional TEE probes with advanced 3D and X-ray–echo fusion tools are commonly used. However, full anaesthesia is required, and TEE-derived

complications are not uncommon, particularly in a fragile population with multiple comorbidities and advanced age. Smaller TEE probes have been developed to avoid the need for anaesthesia and reduce oesophageal complications. However, these so-called

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micro probes lack comprehensive imaging capabilities. Recent technological advancements have addressed these limitations, and for the first time, we present high-quality 3D and X-ray–echo fusion images during paravalvular leak closure, acquired with the mini X11-4t probe (Philips Medical Systems, Andover, Massachusetts). This type of probe, with full imaging capabilities, offers a new option, particularly for higher-risk patients undergoing simpler procedures, avoiding general anaesthesia, and other complications. (Panels A and B) 3D image and GlassVue of the paravalvular septal leak (arrow). (Panel C, [Supplementary data online, Videos S1 and S2](#)) Echonavigator screen: right, 2D colour X-plane image with leak position marked in purple; left, 2D colour X-ray–echo fusion image, the marker is seen to guide crossing of the wire through the leak. (Panel D, [Supplementary data online, Video S3](#)) Right, 3D images with 2D multiplane reconstructions (MPR); left, 3D echo–X-ray fusion images with the wire already in the left ventricle. (Panel E) Right, 3D image of the mitral prosthesis with 2D MPR reconstructions and leak marked in green; left, X-ray–3D echo fusion image with the leak marked and the catheter already through the defect. (Panel F) 2D colour X-ray–echo fusion image (left) during device deployment along with 2D colour images (right). (Panel G) Colour 2D residual leak after closure.

Supplementary data

[Supplementary data](#) are available at *European Heart Journal - Imaging Methods and Practice* online.

Conflict of interest: None declared.

Data availability: The data underlying this article are available in the article and its online [Supplementary material](#).

Lead author biography



Covadonga Fernandez-Golfin works in Ramón y Cajal cardiac Imaging Unit in Madrid. She is the Head of the Non-invasive Imaging Unit in the Cardiology department. She has more than 15 years of experience in cardiac imaging including echocardiography, CMR, and cardiac CT. She is also involved in structural intervention imaging. She has more than 100 articles published regarding cardiac imaging and is involved in national and educational activities.