3D intracardiac echocardiography for left atrial appendage sizing and percutaneous occlusion guidance

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Background: Left atrial appendage (LAA) imaging is critical during percutaneous occlusion procedures. 3D-intracardiac echocardiography (ICE) features direct visualization of LAA from multiple cross-sectional planes at a time.
Purpose: To report procedural success of 3D-ICE-guided LAA occlusion and the correlation between pre-procedural transesophageal echocardiography (TEE) and intraprocedural 3D-ICE for LAA sizing.
Methods: Among 274 patients undergoing LAAO, periprocedural ICE guidance was achieved via a commercially available 2D-ICE catheter (220 patients) or a novel 3D-ICE one (54 patients; Fig.1).
Primary endpoint was a composite of procedural success and LAA sealing at follow-up TEE. Secondary endpoint was a composite of periprocedural device recapture/resizing plus presence of leaks≥3mm at follow-up TEE.
Results: 3D-ICE measurements of maximum landing zone correlated highly with preprocedural TEE reference values [Pearson's: 0.94; p<0.001; bias: -0.06 (-2.39, 2.27)] (Fig.2).
The agreement between 3D-ICE-based device selection and final device size was 96.3% versus 79.1% with 2D-ICE (p=0.005).
The incidence of the primary endpoint was 98.1% with 3D-ICE and 97.3% with 2D-ICE (p=0.99). 2D-ICE patients had a trend towards a higher incidence of periprocedural device recapture/redeployment (31.5% vs 44.5%; p=0.09). The secondary endpoint occurred in 31.5% of 3D-ICE patients versus 45.9% of 2D-ICE ones (p=0.065).
Conclusions: ICE-guided LAAO showed a very high success, with no major adverse events. A very high level of agreement for LAA sizing was found between pre-procedural TEE and periprocedural 3D-ICE. 3D-ICE performed significantly better than 2D-ICE for device size selection and may provide better guidance during device deployment.

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Fig.1 Multiplanar Reconstructions LAA

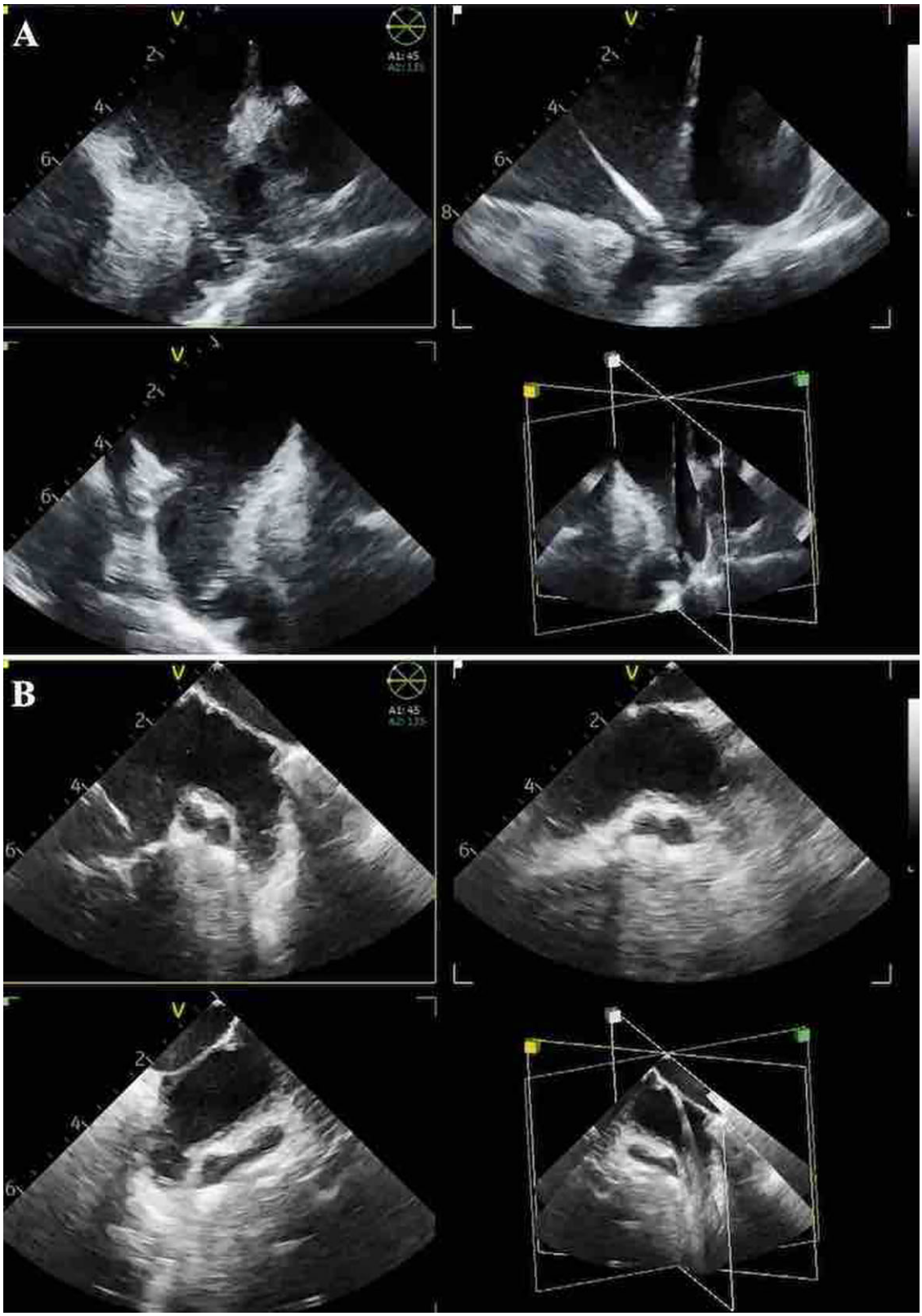

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Fig.2 Bland-Altman Analysis