

Congenitally absent left atrial appendage: cardiac CTA and TEE correlation

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DESCRIPTION

A woman in her late 70s with a medical history of paroxysmal atrial fibrillation which failed cardioversion and pharmacological rhythm control was referred to electrophysiology for consideration of ablation. A cardiac CTA was performed based on provider preference for procedural planning purposes and revealed a moderately dilated left atrium and five distinct pulmonary veins but was unable to rule out the presence of left atrial appendage thrombus as an appendage failed to fill on either first pass or delayed imaging (figure 1). The patient underwent transesophageal echocardiography (TEE) to further investigate the non-visualised left atrial appendage. On TEE, a left atrial appendage was again not visualised using single or biplanar views in addition to the use of colour flow Doppler and contrast-enhanced imaging acquisition (video 1) with intravenous Perflutren Lipid Microspheres (Definity). A hypoechoic area with an echodense structure was identified directly adjacent to where the appendage should have been but did not opacify with echocardiographic contrast agent and was determined to be fat in the transverse sinus (figure 1). The lack of visualisation of an atrial appendage on two separate imaging modalities in a patient on chronic anticoagulation, which would make completely flush occlusive thrombus less likely, was most consistent with a diagnosis of congenitally absent left atrial appendage. The use of echocardiographic contrast was especially helpful in this case given the prominent hypoechoic transverse sinus with mobile fat within the space which could be confused with thrombus in an appendage without careful attention. Congenital absence of the left atrial appendage is an exceedingly rare condition although exact prevalence is nearly impossible to determine. 18 prior cases have been reported in English with the first case having been reported in 2012.¹ The differential diagnosis for a non-visualised left atrial appendage includes flush thrombus, anatomical variants including congenital absence, poor echocardiographic windows and previous procedural intervention including surgical ligation or insertion of occlusive device.² Most previous cases have used more than one imaging modality to confirm the absence of left atrial appendage and most have also been discovered in preparation for treatments related to atrial fibrillation. Given the possibility of poor echocardiographic windows, poorly timed contrasted CT studies and resolution limitations with cardiac MRI,³ this is reasonable to rule out differential diagnoses before making the determination that the

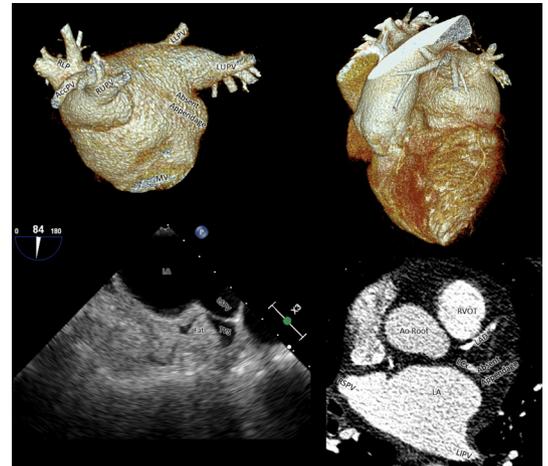
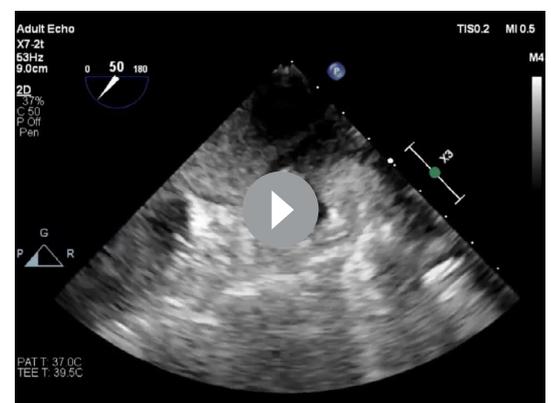


Figure 1 Upper left: 3D reconstruction of left atrium with visualisation of five pulmonary veins and absent appendage in the expected location. Upper right: 3D reconstruction of heart again demonstrating no evidence of atrial appendage. Lower left: representative transesophageal echocardiography image demonstrating fat in the transverse sinus (TVS) adjacent to the left superior pulmonary vein (LSPV). Lower right: representative CT image demonstrating absence of the left atrial appendage in the expected location.

appendage is truly absent. It is worth noting that after a diagnosis of absent left atrial appendage has been made, there is insufficient data to make any recommendations on long-term management. However, it would be reasonable to assume that even if the stroke risk is not eliminated, it is likely reduced, which could affect patient management regarding anticoagulation depending on bleeding



Video 1 Colour Doppler demonstrating left superior venous flow. Ultrasound enhancing used to demonstrate lack of blood flow in the fat-containing transverse sinus.



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risk. Our patient underwent pulmonary vein isolation with cryoballoon ablation and cavotricuspid isthmus ablation and was maintained on apixaban for anticoagulation. She unfortunately went back into atrial fibrillation several weeks after the procedure and has had a significant atrial fibrillation burden.

Learning points

- ▶ Non-visualisation of the left atrial appendage could be secondary to large occlusive thrombus, anomalous location, prior surgical resection, external clipping or presence of a watchman device.
- ▶ Multimodal imaging studies can be used to confirm the aetiology of non-visualisation of the left atrial appendage.
- ▶ This finding could have an impact on risk/benefit calculations regarding anticoagulation and stroke risk on an individual patient basis.

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Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

REFERENCES

- 1 Pourafkari L, Sadeghpour A, Baghbani-Oskouei A, *et al*. Absent left atrial appendage: case report and review of the literature. *Cardiovasc Pathol* 2020;45:107178.
- 2 Collier P, Cavalcante JL, Phelan D, *et al*. Congenital absence of the left atrial appendage. *Circ Cardiovasc Imaging* 2012;5:549–50.
- 3 Khan M, Muthukumar L, Galazka P, *et al*. Nonvisualization of the left atrial appendage and role of multimodality imaging. *CASE* 2021;5:4–6.

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