

Images in Cardiovascular Disease



Multi-Modal Imaging of a Large-sized Right Atrial Appendage Aneurysm in Infancy

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Conflict of Interest

The authors have no financial conflicts of
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Author Contributions

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A 6-month-old male infant presented with unexplained slight tachypnea and tachycardia despite non-significant findings on physical examination. Chest x-ray showed increased cardiothoracic ratio with more prominence at the right cardiac boundary (**Figure 1A**). On 2D-transthoracic echocardiography, a huge-sized aneurysm (3 × 2.8 cm) was seen in continuity with the right atrial free wall partially compressing the right ventricle (**Figure 1B and C**). Colour flow Doppler demonstrated laminar non-restricted flow across the tricuspid valve to the right ventricle with mild tricuspid valve regurgitation of 2.6 m/s in velocity. Moreover, conventional 3D-echocardiography clearly revealed the anatomical boundaries of the aneurysm with no thrombi inside (**Figure 1D and F, Movie 1**). Photorealistic 3D-rendering transillumination Tue-Vue technique allowed more shadowing from virtual lighting; thus, improving the perception of depth and extent of the right atrial appendage aneurysm (RAA) (**Figure 1E**). For further confirmation, a multi-slice cardiac computed tomography angiogram with 3D-reconstructed images was performed which accurately demonstrated the large aneurysm 3 cm × 2.8 cm in diameter (**Figure 2, Movie 2**). The aneurysm was resected successfully at the age of 10 months.

Aneurysm of the right atrial appendage is an extremely rare finding, particularly in pediatric age group. A systematic review showed that median age at presentation is 22 years; however, diagnosis is feasible in fetal life.^{1,2} It was suggested that structural protein defect, abnormal collagen, or dysplastic pectinate muscles could cause the aneurysmal dilatation even with low right atrial pressure.³ Although RAA could be asymptomatic, atrial arrhythmias were reported as a presenting manifestation.^{4,5} Overt heart failure is uncommon; nevertheless, unexplained tachycardia or tachypnea could occur,⁶ as in our case. RAA should be differentiated from other disorders with sizable right atrium, such as atrial diverticulum or Ebstein anomaly. Surgical resection of RAA is mandatory to guard against possible thromboembolic complications.¹

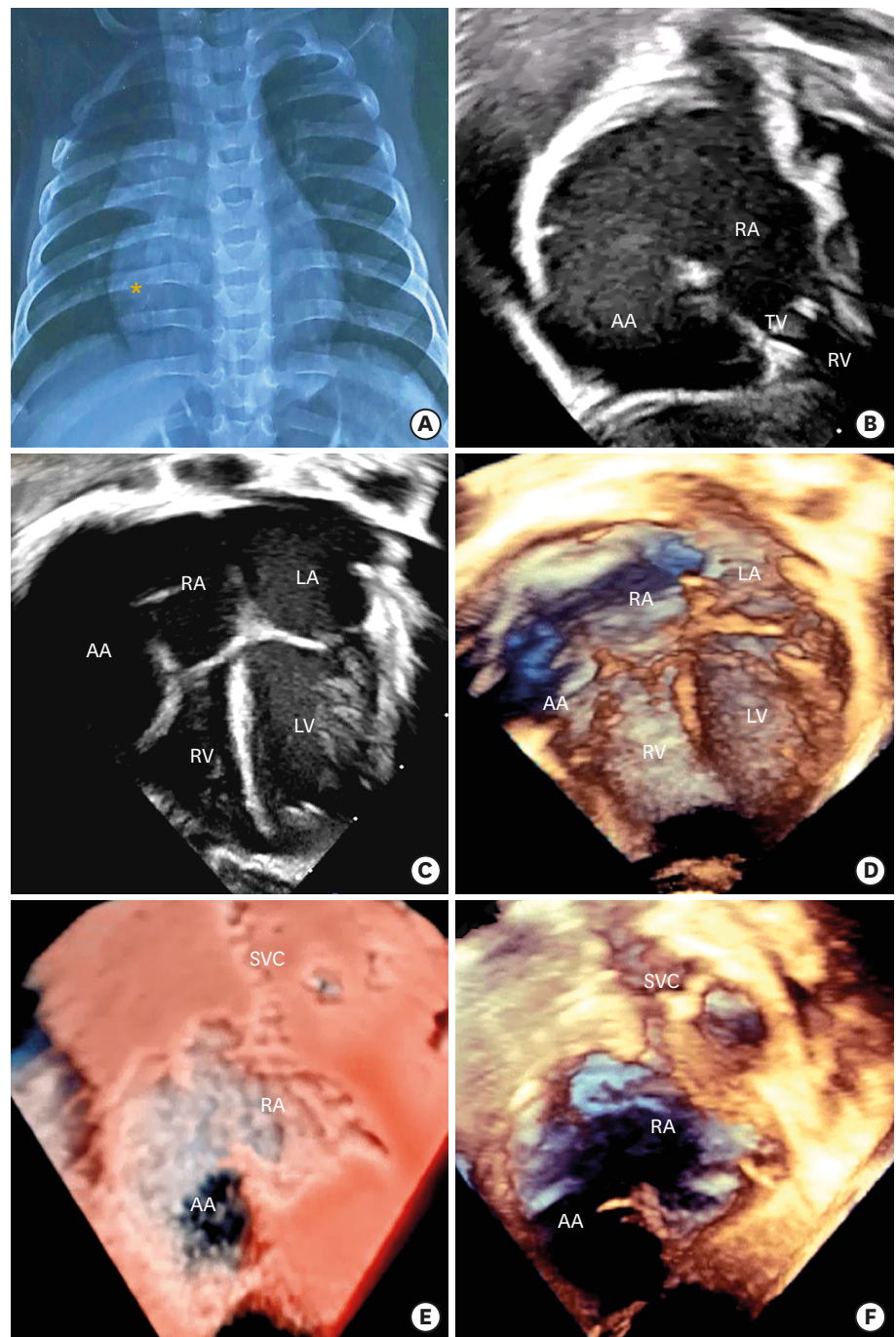


Figure 1. (A) Chest X-ray showing prominence of the right border of the heart (Yellow asterisk) at the site of the aneurysm. (B, C) Two-dimensional echocardiography demonstrating a giant right atrial appendage aneurysmal cavity in continuity with the right atrium in subcostal view and four-chamber view. (D) Three-dimensional echocardiography of four-chamber view demonstrating the aneurysm. (E, F) photorealistic three-dimensional rendering transillumination and conventional three-dimensional echocardiography of subcostal bicaval view showing a large right atrial appendage aneurysm in relation to the atrial structures. AA: aneurysm of the atrial appendage LA: left atrium, LV: left ventricle, RA: right atrium, RV: right ventricle.

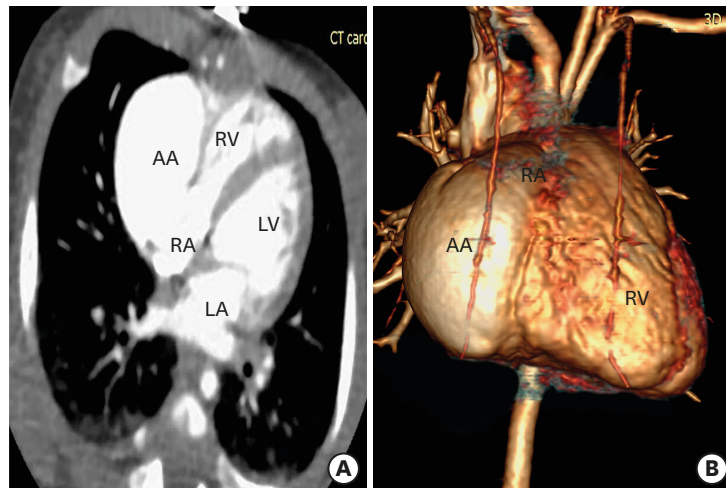


Figure 2. (A) Cardiac computed tomography contrast-enhanced axial CT showing giant right appendage aneurysmal cavity in continuity with the right atrium partially compressing the RV. (B) Three-dimensional reconstruction of multidetector CT showing the right atrial appendage aneurysm. AA: aneurysm of the atrial appendage, CT: computed tomography, LA: left atrium, LV: left ventricle, RA: right atrium, RV: right ventricle.

SUPPLEMENTARY MATERIALS

Movie 1

Conventional Three-dimensional echocardiography of subcostal bicaval view showing a large right atrial appendage aneurysm in relation to the atrial structures.

[Click here to view](#)

Movie 2

Three-dimensional reconstruction of multidetector CT showing the right atrial appendage aneurysm.

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