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Delayed Presentation of Baffle Obstruction in an Adult Post–Mustard Repair of Transposition: Computed Tomography Demonstration

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Abstract

Atrial switch surgery is performed in patients with transposition of the great arteries. One of the complications of this surgery is obstruction of the baffle created. We describe the computed tomography findings of one such case where there was delayed presentation of recurrent Mustard baffle obstruction in addition to pulmonary venous drainage obstruction in an adult previously operated on for intra-atrial repair of transposition of the great arteries.

Keywords

- atrial switch surgery
- baffle obstruction
- transposition of great arteries

Case History

A middle-aged female patient, who was a known case of transposition of great arteries with an intact ventricular septum, had undergone a Mustard atrial switch surgery at 3 years of age with no significant postoperative complications. The patient was on regular follow-up. At 32 years of age, the patient had an episode of transient ischemic attack with spontaneous recovery. Echocardiography at that time revealed normal biventricular function with stenosis of the common chamber to the right atrium (RA; a gradient of ~15 mm Hg) and stenosis of the superior vena cava to the left atrial junction (a gradient of ~20 mm Hg). Moderate tricuspid regurgitation and mild mitral regurgitation were also noted. Computed tomography angiography revealed calcification (►**Fig. 1B**) of the baffle with stenosis in the superior vena cava to left atrial communication (►**Figs. 1**–**2**) and significant stenosis of the anastomotic site between the common chamber, draining all four pulmonary veins with the RA (►**Fig. 3**). No obstruction in the inferior vena cava to left atrial communication through the baffle (►**Fig. 4B**) was seen. A chest radiograph revealed features of mild pulmonary venous hypertension in the form of the prominence of the upper lobe pulmonary veins (►**Fig. 5**). The patient was considered for revision surgery, and intraoperatively, the baffle was found to have shrunk and calcified. The prepulmonic course of the left coronary artery (►**Fig. 4A**) precluded the arterial switch surgery at this time. After longitudinally incising the baffle and left atrial roof, the baffle was reconstructed using a wider Gore-Tex patch, along with widening of the pulmonary venous chamber. The patient was on routine follow-up after this revision surgery. Six years following this revision surgery on routine echocardiography, a superior vena cava baffle obstruction was seen with a gradient of 13/8 mm Hg. Computed tomography angiography at that time revealed tight stenosis of the superior vena cava to left atrium anastomosis (►**Figs. 6**–**7A**) with no stenosis in the pulmonary vein to RA anastomosis (►**Fig. 7B**). The patient was asymptomatic for this superior vena cava obstruction, hemodynamically stable, and presently on follow-up.

Discussion

This case shows the postoperative complications related to atrial switch surgery, such as baffle occlusion. Both baffle stenosis and pulmonary venous obstruction have been reported in the literature, with varying incidences. In the

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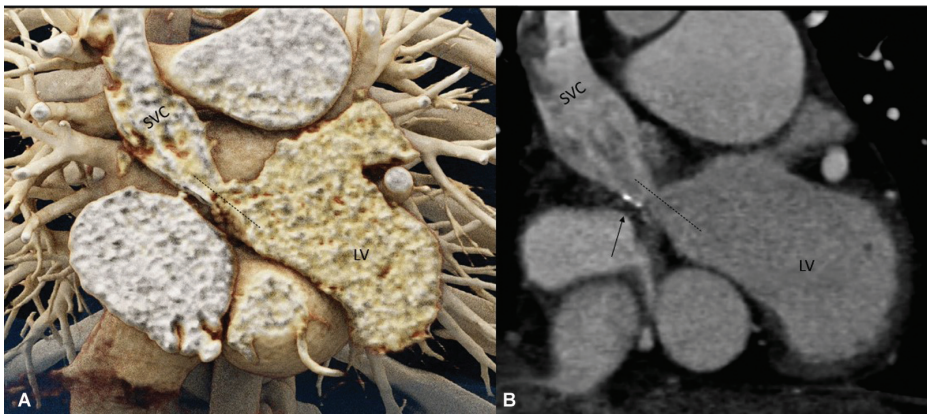

Fig. 1 (**A**) Coronal cinematic volume-rendered computed tomography image showing stenosis (shown by *dotted black line*) of systemic baffle. (**B**) Coronal computed tomography image showing stenosis of the systemic baffle (shown by a *dotted black line*) and calcification of the baffle (shown by a *black arrow*). LA, left atrium; SVC, superior vena cava.

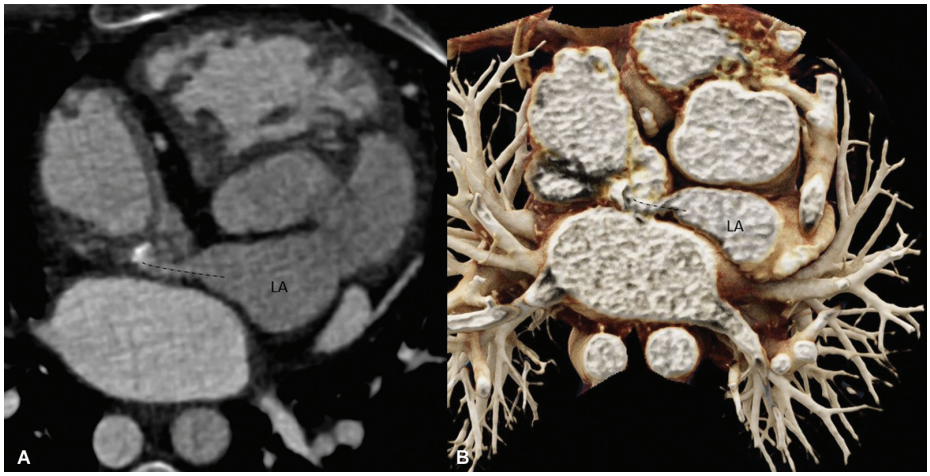

Fig. 2 (**A**) Axial computed tomography image showing stenosis of the baffle between the superior vena cava and left atrium (shown by a *dotted black line*). (**B**) Axial cinematic volume-rendered image showing stenosis of the baffle between the superior vena cava and left atrium (shown by a *dotted black line*). LA, left atrium.

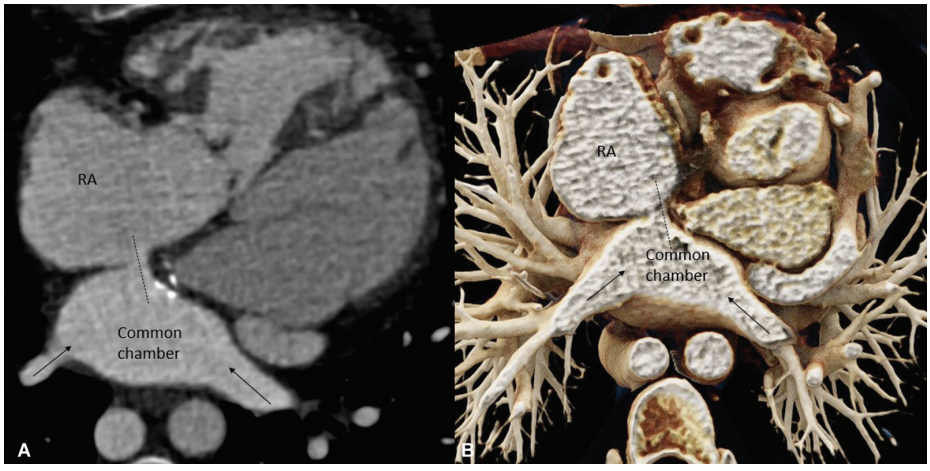

Fig. 3 (**A**) Axial computed tomography image showing stenosis between common chamber draining pulmonary veins (pulmonic veins shown by *black arrows*) and right atrium (stenosis shown by *dotted black line*). (**B**) Axial volume rendered image showing stenosis between common chamber draining pulmonary veins (pulmonic veins shown by *black arrow*) and right atrium (shown by *dotted black line*). RA, right atrium.

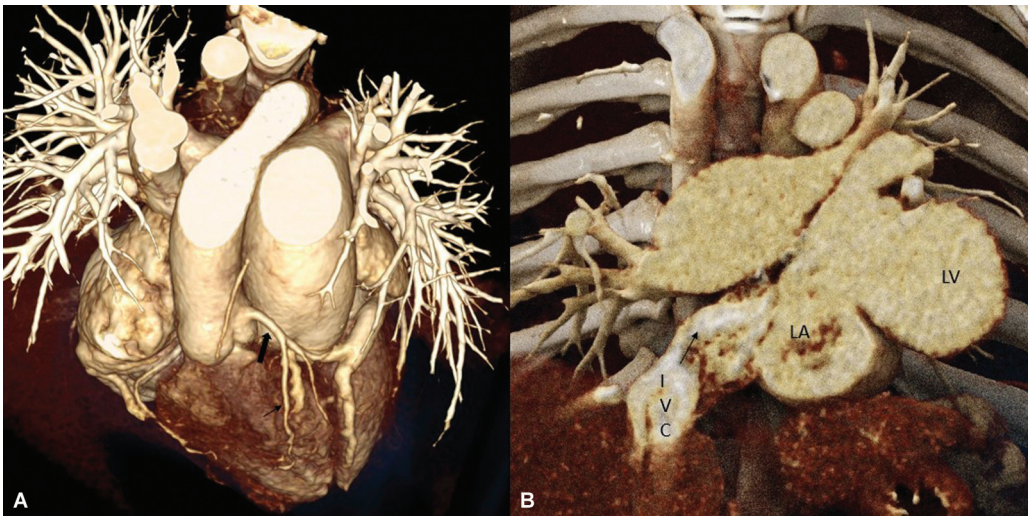

Fig. 4 (A) Volume-rendered image showing the left main coronary artery (shown by *thick black arrow*) having a prepulmonic course with division into the left anterior descending (shown by *thin black arrow*) and left circumflex artery. (B) Oblique coronal volume-rendered image showing drainage of the IVC into the left atrium through a baffle (shown by a *thin black arrow*) with no obstruction. IVC, inferior vena cava.

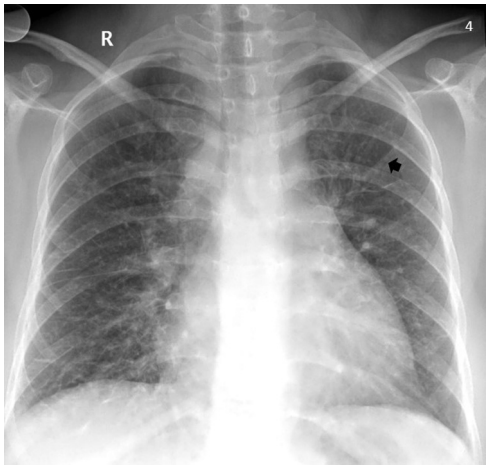

Fig. 5 Chest radiography showing upper lobe venous prominence secondary to pulmonary venous hypertension (shown by black arrowhead).

series of 33 patients by Kron et al, baffle obstruction occurred in one-third of patients (11 of 33) and required reoperation in 8 patients.[1] In a series of 402 survivors of the Mustard operation, described by Williams et al, 3.5% (14) of the children had to undergo reoperation for baffle obstruction.[2] Multiple risk factors have been described as causes of baffle obstruction, and operation at the age of less than 1 year is one of them.[1,2] Other causes include the use of Dacron material, operative techniques, baffle infection, shrinkage, and adhesions of the baffle to the atrial wall.[3]

In the series by Kron et al, the latest age when baffle obstruction developed was 18 months following surgery.[1] In the case of systemic venous obstruction, if there is involvement of both the superior and inferior venae cavae, then only repair is required, whereas pulmonary venous obstruction is a more sinister complication and requires urgent treatment.[4]

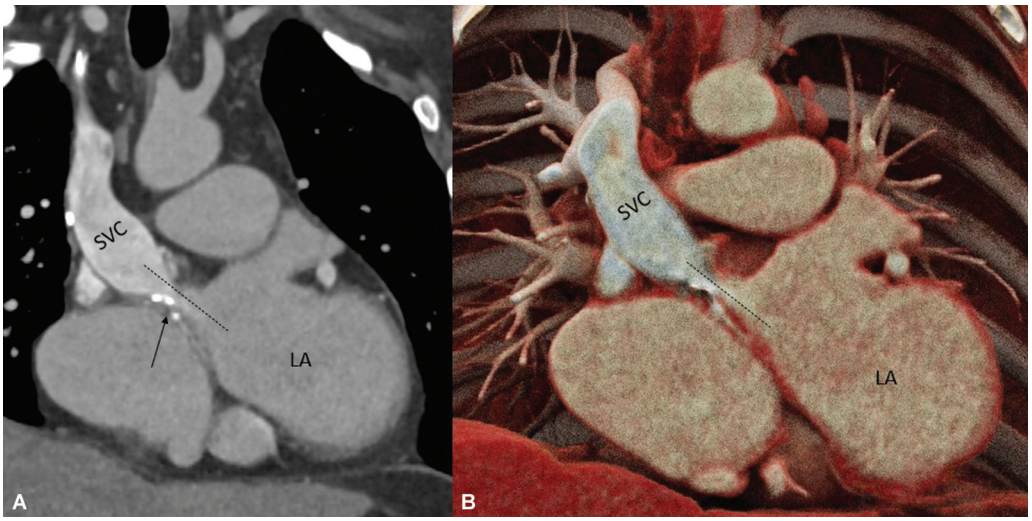

Fig. 6 (A) Coronal computed tomography image showing recurrent stenosis of systemic baffle (shown by *dotted black line*), calcification of the baffle shown by *black arrow*. (B) Coronal cinematic volume-rendered computed tomography image showing recurrent stenosis of the systemic baffle (shown by a *dotted black line*). LA, left atrium; SVC, superior vena cava.

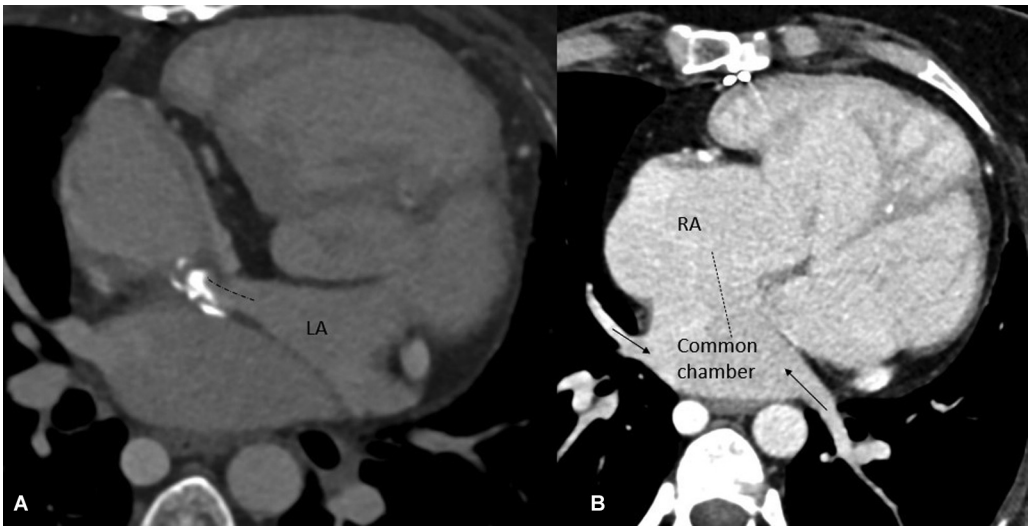

Fig. 7 (**A**) Axial computed tomography image showing recurrent stenosis of the baffle between the superior vena cava and the left atrium (shown by a *dotted black line*). (**B**) Axial computed tomography image showing wide opening between the common chamber draining pulmonary veins (pulmonic veins shown by a *black arrow*) and right atrium (shown by a *dotted black line*). LA, left atrium; RA, right atrium.

Conclusion

This case demonstrated a very delayed presentation of systemic baffle obstruction with its recurrence post–revision surgery and obstruction of pulmonary venous drainage. Computed tomography, particularly multiplanar reformatted images, helps accurately delineate the anatomy of stenosis and plan for urgent surgical management.

Funding
None.

Conflict of Interest
None declared.

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