

## Images in Cardiovascular Disease



# Multi-modality Imaging of Cocaine-induced Rupture of Sinus of Valsalva Aneurysm Communicating with Tricuspid Valve Annulus

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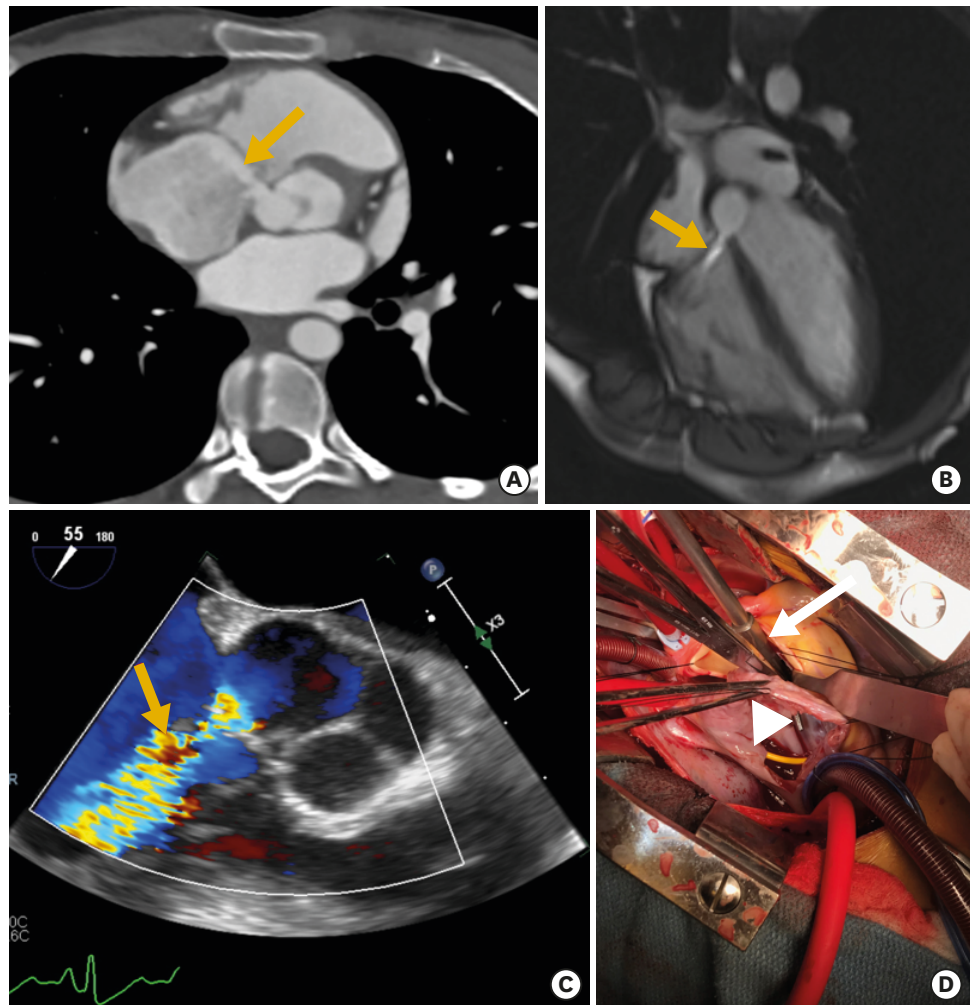
### Conflict of Interest

The authors have no financial conflicts of  
interest.

A 29-year-old woman with history of polysubstance-abuse (cocaine and marijuana) presented with sudden onset of chest pain and severe dyspnea following cocaine abuse. Patient was afebrile and denied intravenous drug abuse. Gated chest computed tomography angiography (CTA) showed severe pulmonary edema and abnormal communication between sinus of Valsalva aneurysm (SVA) and right atrium/ventricle junction (**Figure 1A**). Cardiac magnetic resonance confirmed abnormal communication (**Figure 1B, Movie 1**) and showed pulmonary blood flow (Qp) to systemic blood flow (Qs) ratio [Qp/Qs] of 2.4, confirming significant left-to-right shunt. Infectious workup was negative.

Intra-operative transesophageal echocardiogram demonstrated dilated non-coronary cusp communicating with the right atrium/ventricle (**Figure 1C, Movie 2**) which was confirmed during surgery (**Figure 1D**). The aortic root was repaired using pericardial autologous patch. The defective tricuspid annulus was also repaired. Patient's symptoms significantly improved after surgery.

SVA is rare and can be congenital or acquired. It most commonly involves the right coronary cusp followed by non-coronary cusp.<sup>1)</sup> Ruptured SVA, commonly communicates with right ventricle and is mostly seen with infective endocarditis.<sup>2)3)</sup> Other predisposing factors for rupture are rarely reported.<sup>1)</sup> While cocaine-induced aortic dissection or coronary artery aneurysm have been described,<sup>4)5)</sup> to our knowledge no such report is present for cocaine-induced SVA rupture. Given absence of any other predisposing factor we believe that SVA in our case was most likely congenital, however we are not able to exclude cocaine-induced SVA. Cocaine was strongly postulated as the predisposing factor for SVA rupture however, likely secondary to significant cocaine-induced hemodynamic instability at the time of abuse.



**Figure 1.** (A) Gated computed tomography angiography shows abnormal high-density column of contrast (arrow) extending between the non-coronary aortic cusp and right atrium. (B) Steady-state free precession cardiac magnetic resonance shows abnormal communication of the aortic root and junction of the right atrium and right ventricle seen as a dephasing jet (arrow). (C) Color Doppler transesophageal echocardiogram at the level of the aortic valve shows slightly dilated non-coronary cusp and abnormal jet (arrow) between this cusp and right ventricle. (D) Intra-operative image shows abnormal communication as the right angle clamp is going through fistula from aorta (arrow) to right atrium (arrow head).

## SUPPLEMENTARY MATERIALS

### Movie 1

Cine steady-state free precession cardiac magnetic resonance in 4-chamber view again shows abnormal communication of the aortic root and junction of the right atrium and right ventricle seen as a dephasing jet.

[Click here to view](#)

**Movie 2**

Color Doppler transesophageal echocardiogram at the level of the aortic valve again shows abnormal communication seen as aliasing jet between non-coronary cusp and right ventricle.

[Click here to view](#)

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