

Interesting Image / İlginç Görüntü

An extremely rare coronary artery fistula extending from the sinoatrial nodal artery to the right atrium

Sinoatriyal düğüm arterinden sağ atriyuma uzanan oldukça ender bir koroner arter fistülü

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A 28-year-old female was admitted to our hospital with complaints of palpitations and fatigue. The patient's medical history was unremarkable. The physical examination revealed a hyperkinetic precordium (heart rate 108/min) and a continuous murmur (systolodiastolic) on the right side of the sternum. The patient's blood pressure was 120/70 mmHg. Electrocardiogram revealed atrial fibrillation with a high ventricular rate.

Two-dimensional transthoracic echocardiography (TTE) detected a markedly enlarged right atrium and aneurysmatic right coronary ostium with no

abnormalities of other cardiac structures (Figure 1a). The left ventricular ejection fraction was 60%. Selective coronary angiography revealed a tunnel-like connection that seemed like a fistula extending from the right coronary sinus of Valsalva to the right atrium (Figure 1b). The pulmonary-to-systemic blood flow ratio (Qp/Qs) was assessed as 1.18 during right cardiac catheterization. The pulmonary artery pressure was 32 mmHg.

The images obtained with cardiac multidetector computed tomography (MDCT) revealed a dilated tunnel coursed from the right coronary sinus to the

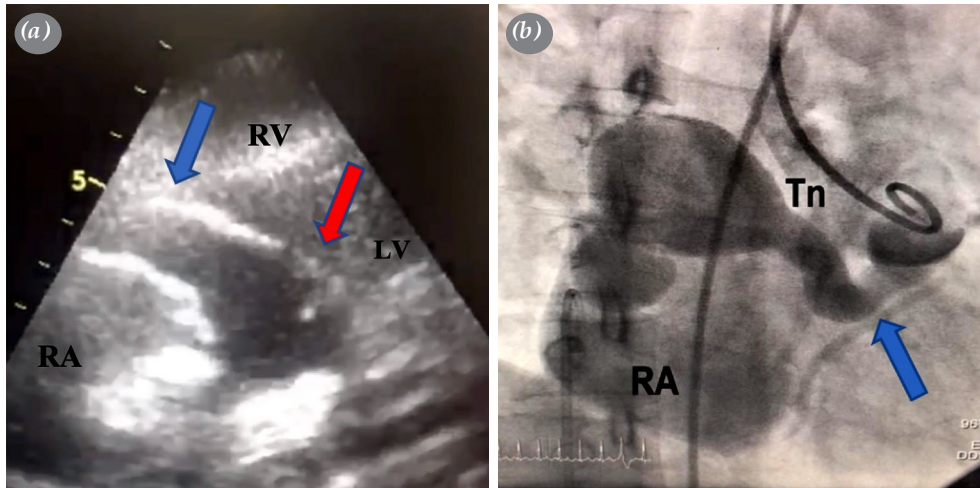


Figure 1. (a) The right coronary sinus (red arrow) and proximal part of the right coronary artery (blue arrow) are observed as aneurysmatic on TTE. (b) Selective coronary angiography reveals the tunnel (blue arrow) draining into the right atrium.

TTE: Dimensional transthoracic echocardiography; Tn: Tunnel; RA: Right atrium.

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superior posterior segment of the right atrium. This connection was identified as the sinoatrial nodal artery due to its projection. At the termination of the fistula, the tunnel was aneurysmally dilated and compressing the superior vena cava. The right coronary artery that originated from the fistula then stretched to the posterior atrioventricular sulcus, dividing into posterior descending and posterior-lateral arteries. Meanwhile, right-side dominance of coronary arteries anatomy was noted (Figure 2a-d). The left main coronary artery and its branches were normal. The patient was offered surgical excision; however, she refused any surgical

treatment. Therefore, it was decided to follow up the patient with medical treatment for congestive heart disease.

A coronary artery fistula (CAF) is an abnormal connection between coronary arteries and the cardiac chambers, great vessels, or coronary sinus without an interposed capillary bed. Most CAFs are congenital; however, acquired forms can also be identified after cardiac surgery, myocardial biopsies, penetrating trauma, or inflammatory diseases.^[1] The most common origins of CAFs are the right coronary artery (50-60%),

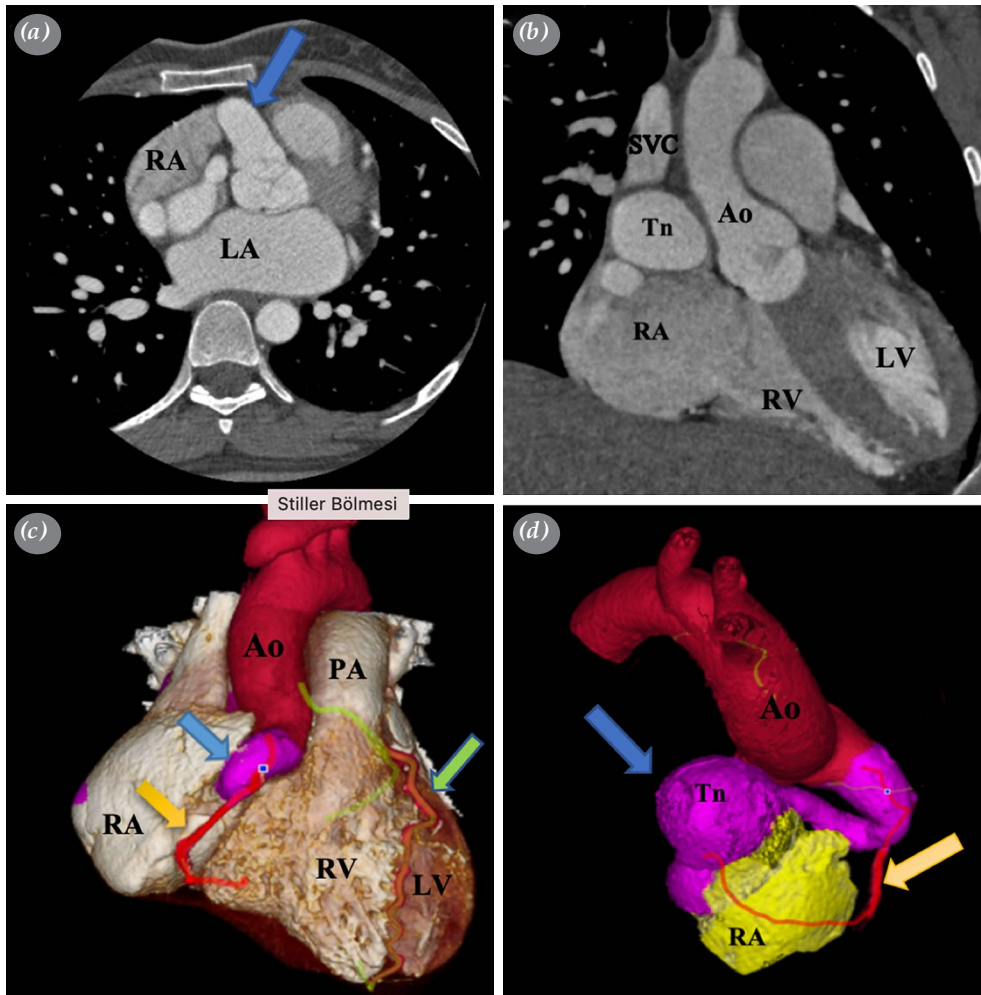


Figure 2. (a-d) Cardiac computed tomography demonstrating the fistula on multiplanar reconstructions and volume rendering images. (a) The aneurysmatic right coronary ostium, which continued a tunnel (blue arrow) in axial images. (b) The curved reformat image displays the tunnel (blue arrow) draining into the right atrium as a coronary artery fistula and the aneurysmatic dilatation at the termination. (c) The volume rendering image reveals the right coronary artery (yellow arrow) separating from the tunnel (blue arrow) and following the posterior atrioventricular sulcus. The left coronary artery is shown to be normal (green arrow). (d) The right atrial appendix subtracted from the volume rendering images, allowing the visualization of the entire tunnel, the right atrium, and the fistula.

RA: Right atrium; LA: Left atrium; SVC: Superior vena cava; Tn: Tunnel; Ao: Aorta; RV: Right ventricle; LV: Left ventricle; PA: Pulmonary artery.

left anterior descending coronary artery (35-40%), left circumflex coronary artery (5-20%), and both coronary arteries (5%).^[1] The majority of CAFs drain into the right ventricle, right atrium, superior vena cava, coronary sinus, or pulmonary arteries.^[1] In addition, there may be unusual drain sites for CAFs at times, such as inferior vena cava.^[2] For diagnosis, TTE is partially helpful in determining indirect findings of a CAF (marked dilatation in coronary arteries, enlarged related heart chamber, and turbulent blood flow). Selective coronary angiography is the gold standard for the imaging of CAFs. It is used to show the presence of the fistula, the vessels that separate from the fistula, and the location where the fistula drains. However, the use of selective coronary angiography for diagnosis and follow-up is limited in patients with no treatment planned due to its invasive nature.^[1] In recent years, the innovations in MDCT have allowed the imaging of nearly all anatomical structures of the heart in a single heartbeat. The drain site of the fistula and the branches separating from the fistula can be demonstrated using cardiac MDCT.^[3]

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Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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