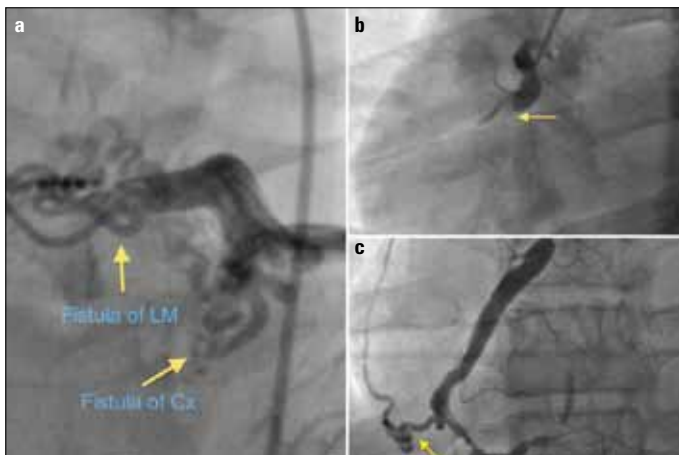
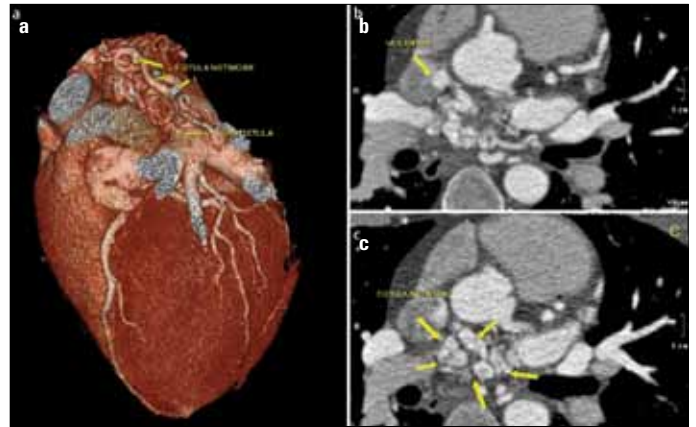


## Multiple coronary artery fistulae presenting with ST-elevation myocardial infarction

A 33-year-old male patient without any major risk factors for coronary artery disease presented to our hospital with typical chest pain that started two hours ago. Electrocardiography showed sinus rhythm and ST elevation in inferior leads (II, III, aVF). The patient was immediately taken to the cardiac catheterization laboratory to perform percutaneous coronary intervention. Coronary angiography revealed fistulae originating from the left main coronary artery (LMCA) and circumflex artery (Cx) (Fig. 1a, Video 1). Proximal segments of the left anterior descending (LAD) artery and Cx were ectatic, and no critical stenosis was noted. The right coronary artery (RCA) was the culprit vessel, and the left Amplatz guiding catheter was preferred because of the unusual origin of the right coronary ostium (Fig. 1b). After an ectatic proximal segment, the middle portion was totally occluded with minimal antegrade flow. After the balloon angioplasty, distal TIMI-3 flow was seen. Fistula formation, which was not evident earlier, was noted to be originating from the middle portion of RCA (Fig. 1c, Video 2). The procedure was terminated because chest pain and ST segment elevations resolved. Intravenous glycoprotein 2b/3a inhibitor was given. Bedside echocardiography showed neither hypokinesia of the RCA region nor other mechanical complications of STEMI. Three days after the index event, 64-slice multidetector computed tomography angiography was performed to determine the exact course of the fistulae. Computed images revealed multiple, dilated, and tortuous fistulae that arose from the proximal portion of LMCA and the proximal and distal portions of Cx and that drained into the superior vena cava by forming a network at the inferoposterior site of the right pulmonary artery (Fig. 2). Fistulae that originated from the middle portion of RCA drained into SVC at the aortic root level. Surgery was recommended to the patient because of multiple fistulae, extreme fistula tortuosity, significant left-to-right shunting (Qp/Qs: 1.9), LMCA involvement, and incomplete revascularization of RCA. However, the patient refused the surgery and requested to be managed conservatively.



**Figure 1. a-c. Coronary angiography views (a) fistulae of LM and Cx arteries (b) totally occluded right coronary artery with absent flow (c) coronary angiographic view of the fistula of the right coronary artery after balloon angioplasty**



**Figure 2. a-c. Coronary multidetector computed tomography views (a) 3-D reconstruction of fistula network (b) fistulae drained into the superior vena cava (c) fistula network**

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**Video 1.** Coronary angiographic view of the fistulae of LM and Cx arteries

**Video 2.** Coronary angiographic view of the fistula of the right coronary artery after balloon angioplasty

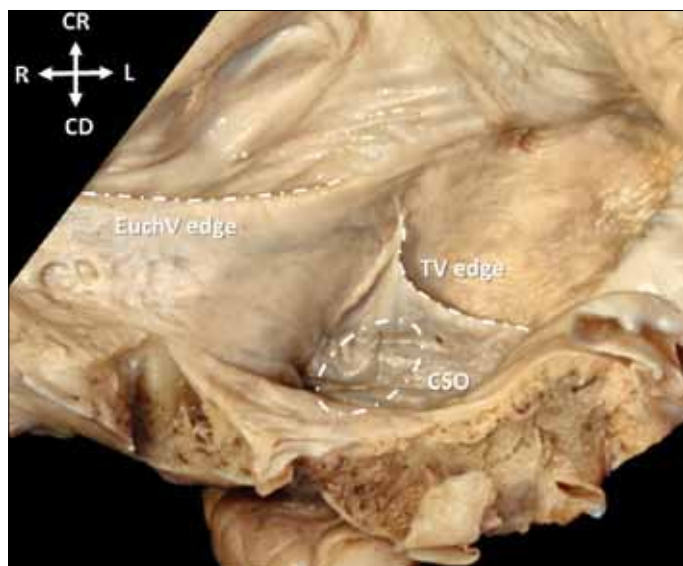
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## Thebesian valve: the cause of unsuccessful retrograde coronary sinus cannulation

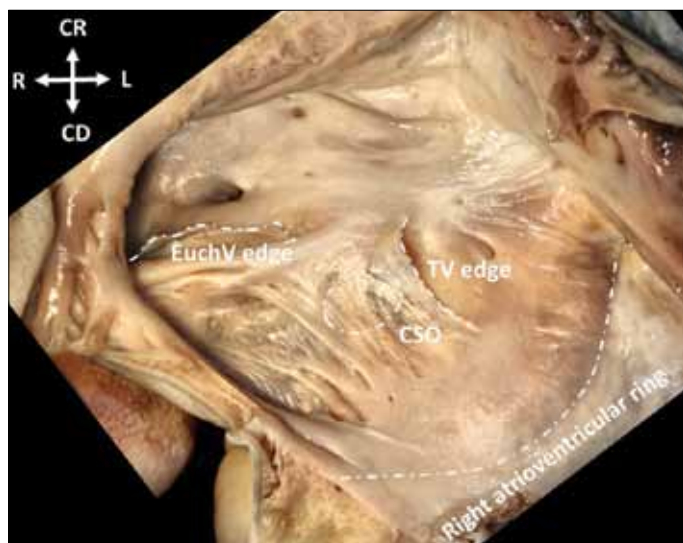
We present the case of a cadaveric heart specimen with Thebesian valve in the shape of a fold, covering the whole coronary sinus ostium (CSO) and going well beyond the CSO contour (Fig. 1). The transverse diameter of CSO is 8.9 mm, the height of the valve is 13.5 mm, and the maximal distance between the free edge of the valve and the atrial surface is 1.9 mm. The CSO is located behind the valve (2.4 mm away from the free edge).

In such a case, because of the large fold of the valve that covers the CSO, conventional retrograde coronary sinus (CS) catheterization is completely impossible through the access by the superior and inferior vena cava. Introduction of the catheter is unattainable not only because of the small width of the entrance under the free edge of the valve but also because of the location of the CSO behind the fold of the valve. The ostium located at such a site requires the insertion of the catheter under the free edge of the valve (if possible) and rapid, tight turning (rotation) of more than 90° in order to gain access to the coronary venous system. This barrier may be overcome with the use of radiofrequency energy to traverse an occlusive valve.



**Figure 1. Thebesian valve that covers the whole coronary sinus ostium (CSO)**

CR - cranial; CD - caudal; L - left; R - right side; TV - Thebesian valve; EuchV - Eustachian valve



**Figure 2. Case 2 - Thebesian valve that covers the whole coronary sinus ostium (CSO)**

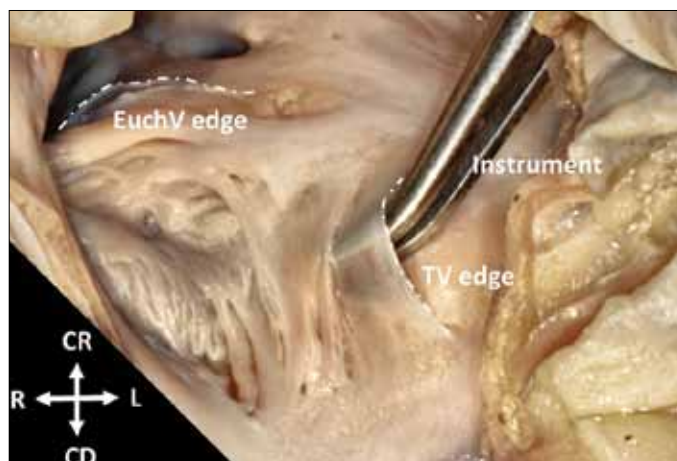
CR - cranial; CD - caudal; L - left; R - right side; TV - Thebesian valve; EuchV - Eustachian valve

According to our observations of 300 cadaver hearts, we can conclude that valves covering more than 100% of the CSO are present in 2.5% of individuals and can make conventional CS cannulation difficult or even impossible (Fig. 2, 3).

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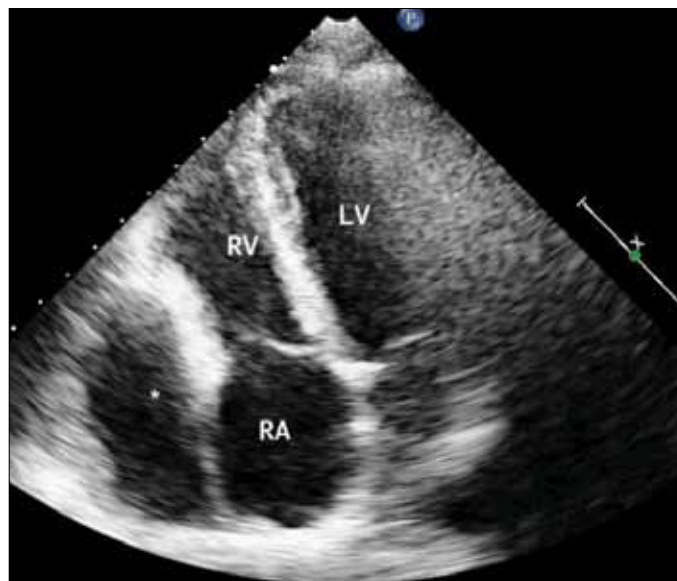


**Figure 3. Case 2: Even the use of excessive force with the instrument (on the border of the tissue strength) does not allow the visualization of coronary sinus ostium**

CR - cranial; CD - caudal; L - left; R - right side; TV - Thebesian valve; EuchV - Eustachian valve

## Echocardiographic diagnosis of an asymptomatic giant right atrial appendage aneurysm

A 36-year-old man with exertional fatigue was referred to the outpatient department of our hospital for assessment. Transthoracic echocardiogram revealed a large cystic mass close to the right chambers, which compressed the entire right ventricle. The lateral side of the tricuspid valve annulus was displaced because of compression (Fig. 1, 2, Video 1). Additionally, transesophageal echocardiography revealed a thin-walled outpouching cavity (85 x 45 mm) with dense echocardiographic contrast in continuity with the right atrium; this was confirmed as a giant right atrial appendage aneurysm (Fig. 3-5, Video 2, 3). Giant right atrial appendage aneurysm is extremely rare. Because of the risk



**Figure 1. Transthoracic echocardiogram in the apical four-chamber view revealed a large cystic mass close to the right chambers, compressing the entire right ventricle**