

Anomalies of the coronary arteries originating from the right sinus of Valsalva

Single coronary artery originating from the right sinus associated with right dominant coronary artery

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Abstract

Anomalous origin of left and right coronary arteries from a single coronary ostium in the right sinus of Valsalva is rare. Accordingly, few reports have described this anomaly. We report a case of a 70-year-old woman with left and right coronary arteries originating from the right sinus of Valsalva. Coronary anomalies are associated with increased mortality, depending on the myocardium at risk. A left main originating from the right coronary sinus is supplying a greater extent of the myocardium and is associated with both an increased incidence of symptoms and of sudden cardiac death. The possibility of such an artery anomaly should always be considered in patients with a history of chest pain or syncope.

Key words : Anomalies of coronary Artery, right sinus of valsalva.

Introduction

Primary congenital anomalies of the coronary arteries occur as isolated anomalies and are not necessarily associated with other types of congenital heart diseases.¹⁾ These could be hemodynamically significant by leading to abnormal myocardial perfusion, while haemodynamically insignificant anomalies are principally those of abnormal aortic origin or distribution of coronary arteries, and myocardial perfusion is usually not altered in these individuals. Widespread application of coronary arteriography has resulted in more frequent detection of patients with anomalous coronary arteries, and their clinical

significance is becoming better appreciated.²⁻⁶⁾

Unrecognised coronary anomalies may lead to errors in clinical diagnosis and surgical problems.⁷⁻⁹⁾ When planning coronary angioplasty on anomalous coronary arteries, there is an even greater need to accurately define the origin and course of these vessels.¹⁰⁻¹¹⁾ Certain anomalous coronary arteries are associated with sudden cardiac death, myocardial infarction and anginal syndrome.^{2,5,6)}

Coronary artery anomalies are rare, but their true incidence is not known. The anomalies are found in approximately 1% of coronary angiograms¹²⁾ and 0.3% of autopsies performed.¹³⁾

Absence of the left main coronary ostium is very rare, occurring with an incidence 0.4%.¹⁴⁾

We report a patient with the entire coronary origin arising from the right sinus of Valsalva.

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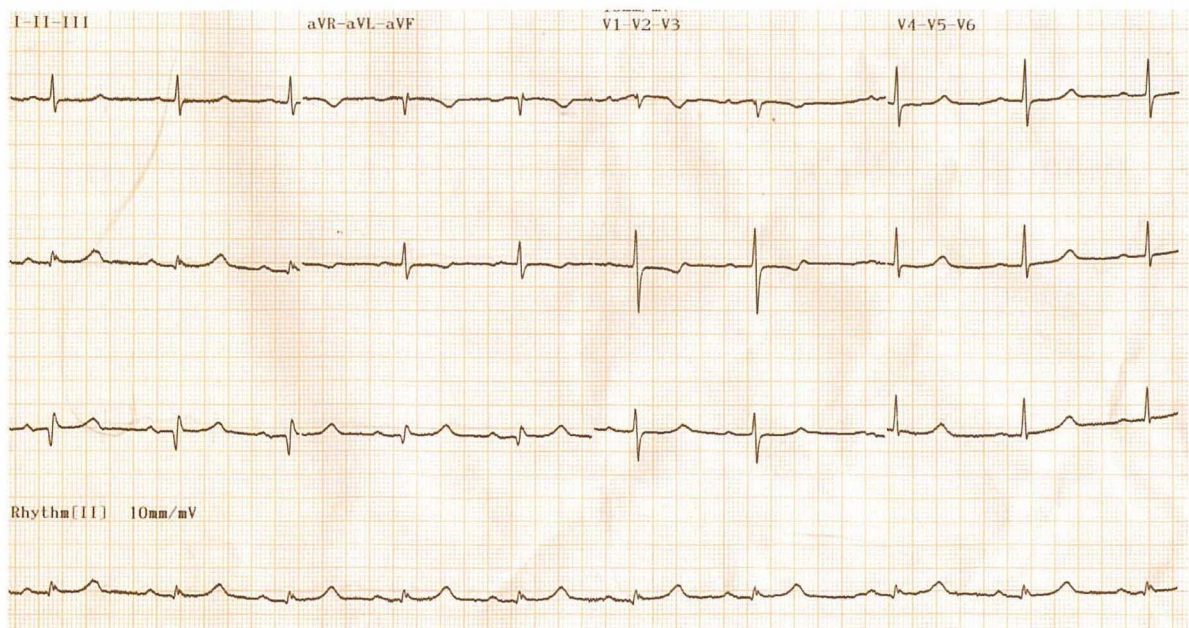


Fig 1 electrocardiogram showed Q wave in lead II, III and aVF.

CASE REPORT

A 70-year-old woman with coronary artery risk factors including hypertension, hypercholesterolemia was admitted for aggravating angina. She had anti-anginal medications for 2 years at local hospital, but despite optimal medical there was no significant symptom improvement. She was transferred to our hospital for evaluation including coronary angiography. No remarkable findings were observed on physical examination. Her electrocardiogram showed Q wave in lead II, III and aVF.(Fig 1). Her chest X-ray was normal. Echocardiography revealed normal left systolic function.

Coronary angiography revealed that the left descending coronary artery (LAD) anomalously originated from a common ostium with the right coronary artery (RCA) in the right sinus of Valsalva (RSV). The RCA originated from a common ostium with the right coronary artery (RCA) in the right sinus of Valsalva and distributed all area of LCX artery - so called right dominant coronary artery.(Fig 2, Fig 3)

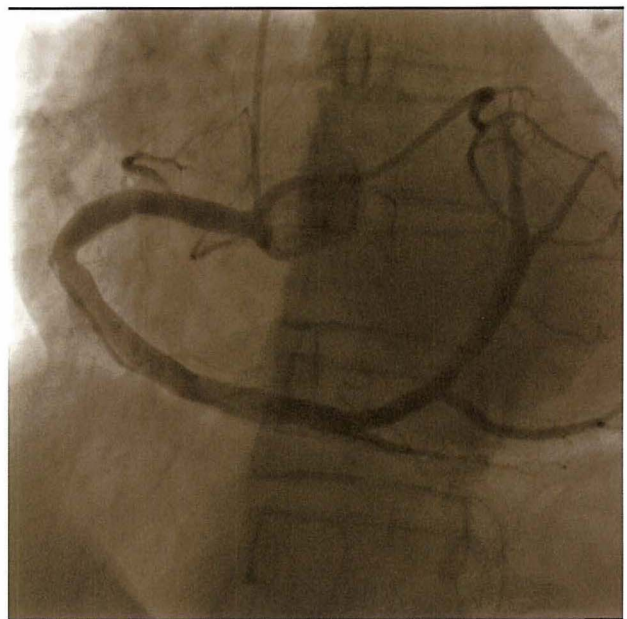


Fig. 2. Left anterior oblique view showing anomalous left coronary artery originating from right coronary sinus.

Aortogram revealed no other coronary artery from left coronary sinus of Valsalva. (Fig 4)

The patient was advised to avoid strenuous exercise and her condition was unremarkable on followup (at 6 months after coronary angiography).

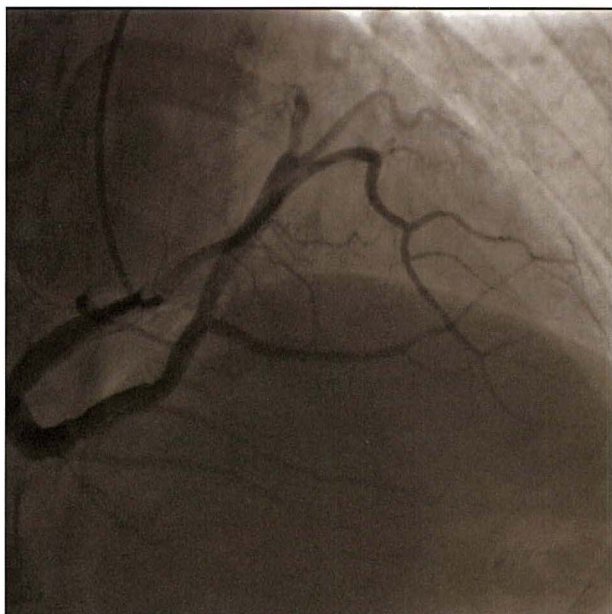


Fig. 3. AP cranial view showing anomalous left coronary artery originating from right coronary sinus.

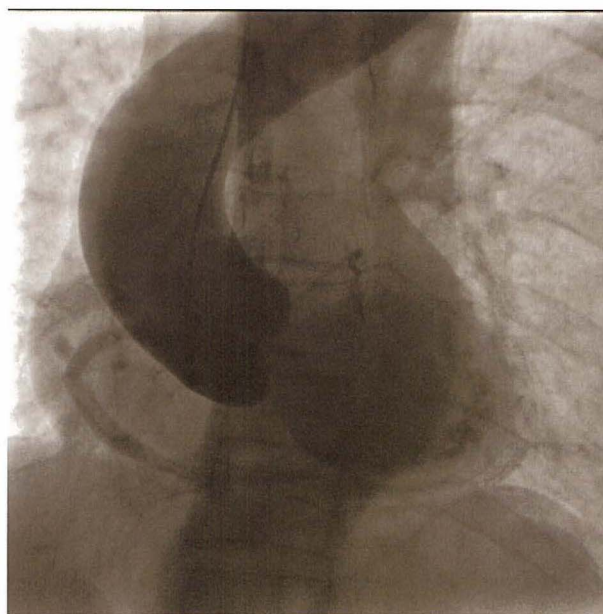


Fig 4. Aortogram revealed no other coronary artery from left coronary sinus of Valsalva.

DISCUSSION

Coronary anomalies are associated with increased mortality, depending on the myocardium at risk. The presence of an anomalous LMCA originating from a single ostium in the RSV is found in 0.017% of all coronary angiography cases and 1.3% of patients with anomalous coronary anatomy.^{1,2)} The clinical significance of the anomalous LMCA originating from the RSV depends on its relationship with the aorta and the main pulmonary artery.

A left main originating from the right coronary sinus is supplying a greater extent of the myocardium and is associated both with an increased incidence of symptoms and of sudden cardiac death.¹²⁾ The latter may be due to compression of the proximal coronary artery by the pulmonary trunk or more likely by the aortic wall. The dynamic compression during systole may also compromise the coronary blood flow. However, numerous other causes may explain the increased risk in patients with an anomalous origin of the coronary arteries. This includes the size of the

slit-like coronary ostium, the angle of the coronary ostium in relation to the aorta, and the length of intramural passage.¹³⁾

Although a left coronary artery arising from the right sinus of Valsalva is a rare anomaly, it is commonly associated with sudden death in young trained athletes.¹⁴⁾ Therefore the possibility of such an artery anomaly should always be considered in young individuals with a history of chest pain or syncope. Prodromic symptoms like exertional dyspnea, chest pain or syncope can be the first manifestation of a coronary anomaly.

Catheter-based revascularization of this anomaly is a therapeutic challenge for interventional cardiologists. Percutaneous coronary intervention (PCI) of an anomalous coronary artery requires proper angiographic recognition of the anatomic details, such as the orifice configuration, exit angulation, and the route of the anomalous artery. In selected patients, a lesion in a LMCA of anomalous origin can be treated safely and successfully with PCI. Few patients are reported in the literature with coronary stenting of an anomalous

LMCA.^{5,8)}

To our knowledge, our report is the first to illustrate PCI of an anomalous LMCA originating from a single ostium in the RSV and coursing posterior to the aortic trunk. Since the single ostium usually has a very large caliber, the risk of guiding catheter damage is low. In our case, the lesion characteristics (focal and in the mid portion of the LMCA) made it suitable for percutaneous approach. Moreover, as frequently seen in this type of anomaly, the left coronary system was smaller than usual. The successful angiographic result and the asymptomatic status of our patient in the follow-up support this therapeutic option. We suggest that appropriate guide-catheter selection and careful manipulation are essential for the success of percutaneous revascularization in this anomaly.

Conclusion

Anomalous origin of left and right coronary arteries from a single coronary ostium in the right sinus of Valsalva is rare. Accordingly, few reports have described this anomaly. We report a case of a 70-year-old woman with left and right coronary arteries originating from the right sinus of Valsalva. The possibility of such an artery anomaly should always be considered in patients with a history of chest pain or syncope.

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