

Case study

Malignant course of Right Coronary Artery

Abstract

Anomalous origin of a coronary artery is uncommon but clinically significant. Manifestations vary from asymptomatic patients to those who present with angina pectoris, myocardial infarction, syncope, arrhythmias, and sudden cardiac death. We herein describe a rare case of an anomalous origin of the RCA with malignant course between aorta and pulmonary artery. Angiography is invasive, have a relatively low cannulation success rate. Therefore, CT coronary angiography is the best method for imaging. Sudden death without symptoms occurs frequently in patients with anomalous RCAs, so surgical repair is recommended.

Introduction-

Anomalous aortic origin of a coronary artery is uncommon but potentially clinically significant. Manifestations may vary from asymptomatic patients to those who present with sudden cardiac death, myocardial infarction, syncope, heart failure, angina pectoris and arrhythmias. In the present case we describe an anomalous origin of the right coronary artery (RCA) from the left sinus of Valsalva with malignant course of RCA between aorta and pulmonary

artery which is a very rare anomaly, and its incidence is 0.019% to 0.49% on coronary angiography.¹⁻³

Case Report-

A 65-year-old male patient presented to emergency room with history of syncope and sweating from last 2 days, pulse rate was 54 per minute and blood pressure being 118/76 mm of hg with no postural variation, on examination first and second heart sounds were normal without any murmur, neurological examination was normal. Electrocardiogram was done that showed sinus rhythm with early repolarization changes. Echocardiography was suggestive of no regional wall motion abnormality with normal ejection fraction. Blood test like complete blood counts, liver and renal function test were normal, random blood sugar was 128mg/dl and serum electrolytes were within normal limits Troponin T was negative, stress test was done which was inconclusive at 6.4 Mets by modified Bruce protocol, patient developed significant breathlessness during the test which made him to stop the test but patient did not had any presyncope or syncope. Holter monitoring was done for 72 hours and was normal. He was then subjected a coronary angiography which showed normal coronaries but anomalous origin of Right coronary artery (RCA) from left sinus of Valsalva and a malignant course between aorta and pulmonary artery (fig .1.1 and 1.2). After this CT coronary angiograph was done which confirmed the

diagnosis of malignant course of RCA (fig.2). Patient was then sent for corrective surgery.

Discussion-

The incidence of coronary artery anomalies is approximately 1% among patients undergoing cardiac catheterization,⁽¹⁻³⁾ 0.29% among autopsy specimens,⁽⁴⁾ and less than 0.1% among prospective echocardiography screenings.⁽⁵⁾ Most anomalies are incidentally detected and do not create clinical problems.⁽¹⁻⁴⁾ Anomalous origin of the right or left coronary artery from the contralateral sinus of valsalva which is described above is uncommon and mostly asymptomatic but many patients, particularly young ones, present with sudden death or myocardial ischemia with or without symptoms. These anomalies are rare, and many cardiologists and radiologists are unfamiliar with them. Around 19-33% of sudden cardiac deaths in the young population are attributable to coronary artery anomalies.⁽⁶⁾ hence it is importance of indentifying them.

The Pathophysiology of the restricted coronary blood flow seen in this anomaly is suggested to be due to the acute takeoff angle, slit-like orifice, compression of the intramural segment by the aortic valve commissure, lateral luminal compression of the intramural portion of the coronary artery and

compression of the coronary artery between the aorta and the pulmonary artery (7-9). However, there is still controversy concerning the mechanism by which the interarterial course is compressed between the aorta and the pulmonary artery. An intravascular ultrasound (IVUS) study⁽¹⁰⁾ found that luminal compression of the coronary artery was mainly due to the aorta because the pressure of the aorta is much greater than pulmonary artery. Various methods available for evaluation of anomalous RCAs include echocardiography, angiography, Multidetector computed tomography (MDCT) scan, and Magnetic resonance imaging (MRI). Non-invasive tools such as MDCT⁽¹¹⁻¹⁴⁾ and MRI⁽¹⁵⁾ can provide precise information about the complex anatomy of coronary artery anomalies, MDCT scan is preferred due to its higher spatial resolution and rapid exam time as compared to MRI. MDCT can also provide multiplanar image reconstructions to permit precise evaluation of the takeoff portion and course of the anomalous coronary artery. Evaluation is difficult in angiography because the complex three-dimensional structure is displayed in a two-dimensional plane, and selective cannulation of the anomalous coronary artery is made difficult by the small, slit-like orifice. The success rate of selective cannulation is 55-61%. MDCT provides excellent information concerning orifice location and the course of the anomalous coronary artery. The size and shape of the slit-like orifice differ according to image projection, so multiplanar image reconstruction is necessary in precise evaluation. Angiography is invasive procedure, have a relatively low cannulation success rate, and is limited with

respect to multiplanar image reconstruction. Therefore, MDCT is the best method for imaging coronary artery anomalies despite its radiation. Surgical treatment methods are variable. The unroofing procedure^(16,17) manipulates the orifice, enlarges the orifice, and makes an acute angulation, which decreases the lateral compression of the intramural segment. Sudden death without symptoms occurs frequently in patients with anomalous Left coronary arteries, so surgical repair is recommended.⁽¹⁸⁾ However, sudden death is extremely rare in asymptomatic patient with anomalous RCA.

Conclusion

On the basis **of above case report it is advisable** to be vigilant in symptomatic patient for malignant anomalous RCA. This case report also emphasizes the role of non-invasive CT Coronary angiography in accurate detection of anomalous coronaries and their malignant course.

References-

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Fig. 1.1 and Fig. 1.2 - Coronary angiography - showing anomalous origin of RCA from left sinus of Valsalva.

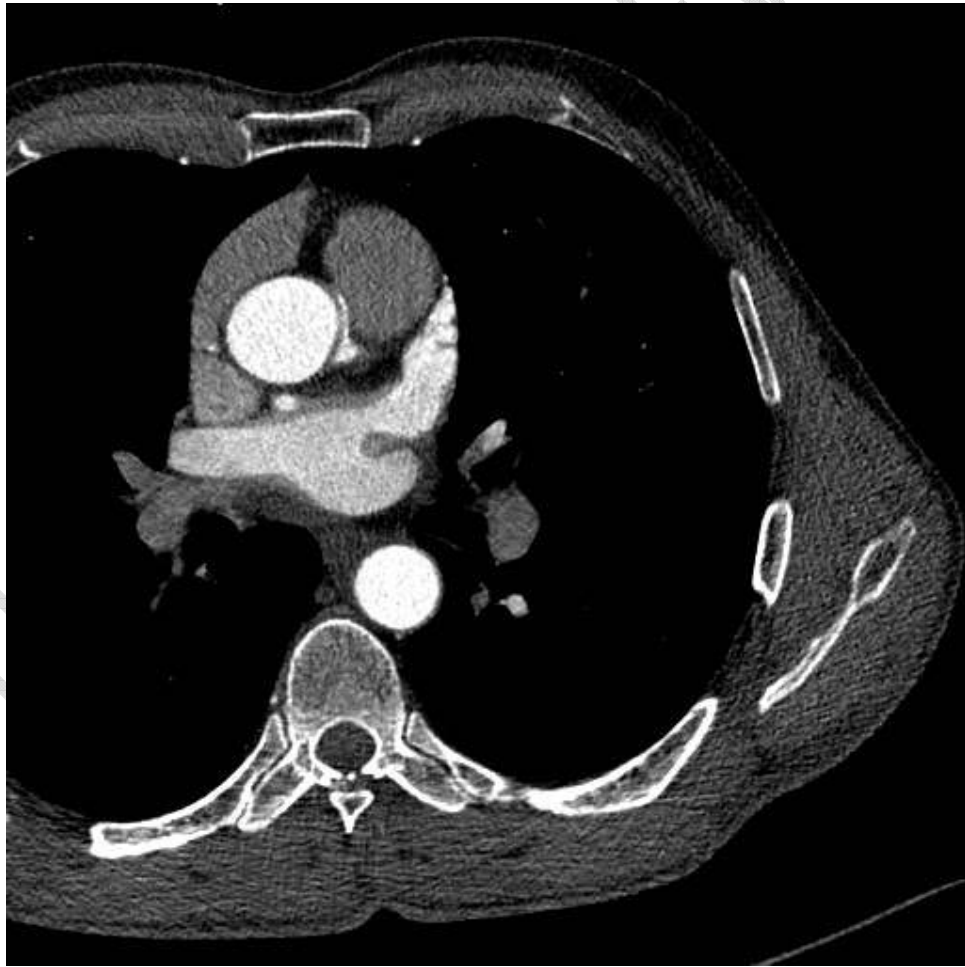


Fig. 2 CT coronary angiography showing malignant course of RCA between aorta and pulmonary artery.

Ethical issues – None

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