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A Case Report

Anomalous Origin of Left Coronary Artery from Right Sinus of Valsalva: A Case Report

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ABSTRACT

C*ongenital anomalies of the coronary arteries are a cause of sudden cardiac death. Of the known anatomic variants, nomalous origination of a coronary artery from an opposite sinus of Valsalva (ACAOS) remains a major clinical issue and a challenging condition to treat. We present a case of 82 years old female patient with chest pain, who underwent a diagnostic coronary angiography. She was found to have an extremely rare anomalous coronary origin (Left main coronary artery arising from the right sinus of valsalva). The patient was successfully treated conservatively.*

Keywords: *Congenital coronary anomalies, Chest pain , Coronary angiography*

1. INTRODUCTION:

Coronary artery anomalies represent a life-threatening form of congenital cardiac pathology. The underlying cause of sudden cardiac death in patients with congenital coronary abnormalities is multifactorial and has been stated with multiple competing theories.

The term 'coronary artery anomaly' (CAA) is used when the observed coronary pattern is seen in less than 1% of the general population (1). The overall incidence of CAA has been estimated between 0.9% and 5.6% (2–3). Based on the origin and course of the anomalous artery, CAA can either represent a benign incidental finding or can have severe cardiovascular sequelae. Of the known anatomic variants, anomalous origination of a coronary artery from an opposite sinus of Valsalva (ACAOS) remains a major clinical issue and a challenging condition to treat.

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2. CASE PRESENTATION

An 82 years old female patient presented to our facility with complains of new-onset substernal chest pain and shortness of breath. Other relevant medical history included hypertension and dyslipidemia.

On presentation, the patient was hemodynamically stable and physical examination including cardiovascular auscultation was unremarkable.

Electrocardiography was done showing no ST-T changes. Lab studies were normal including troponin I.

Acute coronary syndrome was still suspected in an 82 years old female patient with multiple risk factors presenting with resting chest pain.

Coronary angiography was done via the right radial approach using a Judkins left and right catheter.

After an initial failed attempt to first cannulate the left coronary ostium to evaluate for concomitant left anterior descending (LAD) and circumflex disease (Fig.1), the right coronary ostium was engaged instead, which revealed a large caliber RCA descending through the coronary sulcus to the crux, before bifurcating into the posterior descending artery and posterolateral artery(Fig.3a).

Contrast injection into the RCA also showed the anomalous origin of the Left coronary artery stemming from the right coronary cusp (Fig.2) .All three arteries are free of significant disease.

The diagnosis was made: Anomalous coronary artery origination from an opposite sinus of valsalva (ACAOS).

Coronary CT angiography was ordered to see the possible interarterial course of left coronary artery but not done due to financial problems.

Optimization of medical treatment and control of risk factors were the treatment of choice in such case.

3. DISCUSSION

The overall incidence of the abnormal aortic origin of the coronary arteries is estimated to be approximately 0.64% of births (4).

The most common anomaly is the origin of the left circumflex artery from the right sinus of Valsalva, followed by the origin of a single coronary artery from the left sinus of Valsalva, origin of both the right and the left coronary arteries from the right sinus of Valsalva, and the LAD originating from the right sinus of Valsalva.

The prevalence of the RCA arising from the left sinus of Valsalva is approximately 0.17% while the rarest anomaly is the left coronary artery arising from the right sinus of Valsalva and its prevalence is around 0.047% (5).

The clinical presentation in ACAOS is commonly anginal chest pain or syncope that occurs mostly with exercise or other strenuous activities. In young athletes and military recruits, the first clinical presentation may unfortunately be sudden cardiac death.

The pathophysiology behind syncope, myocardial ischemia, and sudden cardiac death has been postulated to be the compression of the anomalous coronary artery between the aorta and the pulmonary artery on its way to the left ventricle.

Diagnosis is mainly based on the high index of clinical suspicion for the anomalous origin of the coronary artery. Coronary magnetic resonance angiography (CMRA) and coronary computed tomographic angiography (CCTA) are important noninvasive diagnostic tools that are being increasingly used to detect such cases.

Coronary angiography is the gold standard for the diagnosis and evaluation of the origin and the course of anomalous coronary arteries and is particularly important when the noninvasive test fails to yield definitive results.

In patients with symptoms arising from ventricular tachyarrhythmia or myocardial infarction, surgical intervention is indicated, particularly in cases of the origin of the left coronary artery from the right sinus of Valsalva.

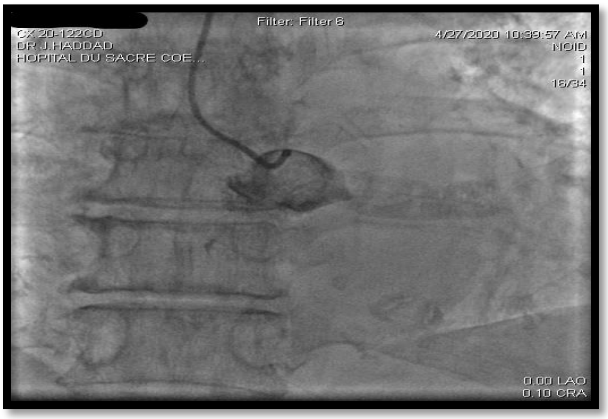

Fig 1: Coronary angiogram showing absence of left coronary artery in the left coronary sinus.

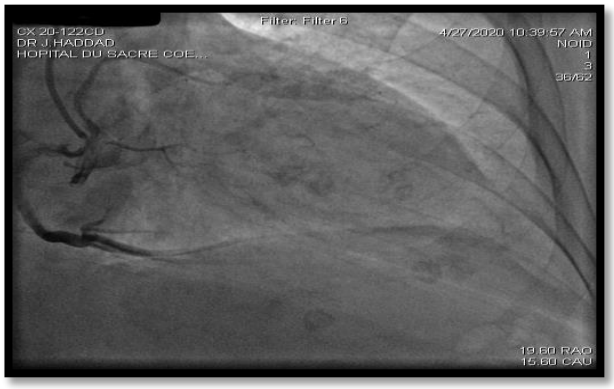

Fig 2: Angiographic view (RAO/CAU) demonstrates the anomalous origin of left coronary artery from the right sinus of valsalva. (3 ostiums a part : LAD,CX,RCA).

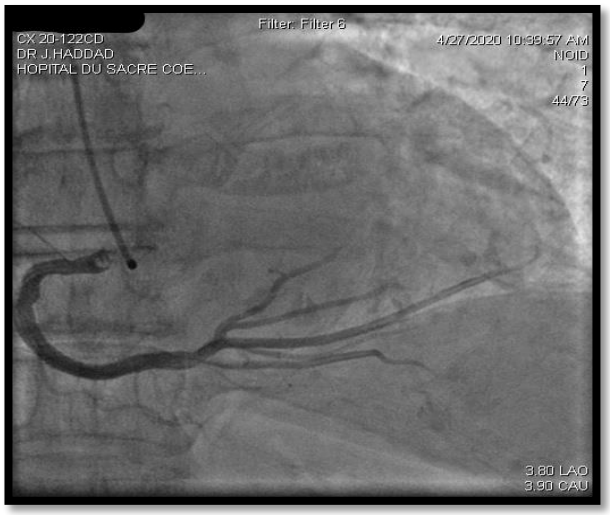

Fig 3a: Right coronary artery with its ostium arising from right sinus of valsalva.

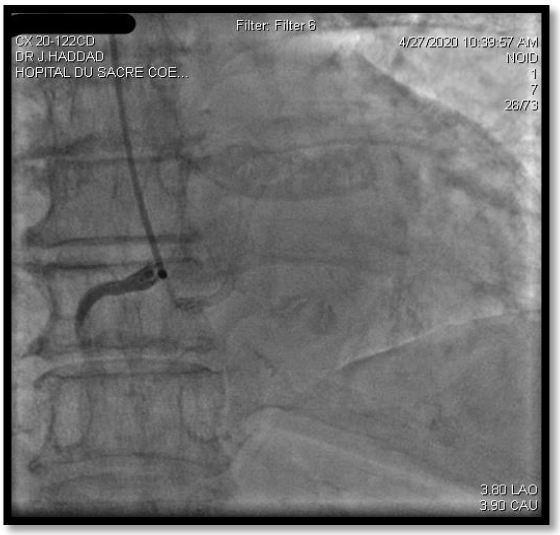

Fig 3b: Proximal left anterior descending artery and proximal RCA arising each from an ostium a part

4. CONCLUSION

We report an extremely rare case of congenital coronary artery anomaly in an 82 years old female patient with ACAOS that was treated conservatively.

The true prevalence of coronary artery anomalies in the general population is unknown. In addition, the absolute risk of sudden cardiac death is difficult to predict and hinges upon multiple variables. Although the majority of the patients are asymptomatic, further evaluation with coronary CTA is warranted to rule out potential malignant pathology.

Treatment of coronary artery anomalies is controversial and dependent on the discovered anatomy. Surgery is the mainstay of treatment though beta blockers and calcium channel blockers have been utilized to lessen ischemic symptoms.

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