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Left Main and Right Coronary Artery Arising from Single Coronary Trunk: A Very Rare Cardiac Anomaly

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Authors' contributions

This work was carried out in collaboration among all authors. Author AG designed the study and performed the procedure. Author RR wrote the first draft of the manuscript and managed the literature searches. Author SS managed the analyses of the study. Authors KM and NOB did the proof reading. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Aim: Single coronary artery is a rare anomaly. Patients may present with syncope, angina or rarely sudden cardiac death.
Presentation of Case: Patient presented with dyspnea on exertion for one year. On 2D Echo patient had small restrictive VSD. On coronary angiography single coronary artery from right cusp was seen. On CT angiography anomalous origin was confirmed. There was no malignant course of coronary artery.
Discussion: Anomalous origin of coronary arteries are rare cardiac anomalies. It can present as syncope, angina, or sudden cardiac death especially in patients with malignant course of coronary artery passing between aorta and pulmonary artery. Hence CT coronary angiography is useful to rule out the malignant course. In our patient, there was no malignant course hence managed conservatively.
Conclusion: Anomalous origin of coronary artery is a rare anomaly and requires tailored treatment according to type and course of artery.

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Keywords: Left main; right coronary artery; anomalous coronary artery.

ABBREVIATIONS

RCA : Right Coronary Artery
VSD : Ventricular Septal Defect
CT : Computed Tomography
PTCA : Percutaneous Transluminal Coronary Angioplasty

1. INTRODUCTION

Single coronary artery anomaly is rare, with an estimated incidence of approximately 0.03%. [1] Anomalies of Coronary arteries are clinically silent. However, rarely coronary anomalies with malignant course may cause symptoms like syncope and angina and rarely may be the cause of sudden cardiac death usually in young adulthood.

2. PRESENTATION OF CASE

18 year old male patient was admitted with chief complaints of dyspnea on exertion NYHA class I for 1 year. He had no history of chest pain, syncope or presyncope, palpitation, paroxysmal nocturnal dyspnea or orthopnea. There was no history suggestive of squatting spells or recurrent respiratory tract infections in childhood. On examination pulse and blood pressure were normal. He had no cyanosis or clubbing. Limb arterial saturation was normal on oximetry. Electrocardiogram was normal. 2D echo was done suggestive of tiny restrictive ventricular septal defect. He was taken for cath study. Cath study didn't show any significant shunt across VSD which was suggestive of small and restrictive ventricular septal defect. Qp/Qs was calculated to be 1.3 which showed that shunt across Ventricular septal defect was not significant. However, on coronary angiography incidentally, he was diagnosed to have single coronary (Fig. 1). The single coronary arose from right coronary cusp and gave rise to Left main and Right coronary artery. The Left main then divided into LAD and LCX territories (Fig. 2).

Patient was later sent for coronary CT angiography to see for malignant course of arteries. On CT coronary angiography, anomalous origin of left main (LM) coronary artery from Right main coronary artery just distal to its origin indicating single coronary trunk arising from right sinus of valsalva was seen. LMCA was coursing posterior to the aorta between the left atrium to the left and the aortic root anteriorly. No evidence of malignant course between MPA and Aorta was noted. As there was no malignant course of coronary arteries patient was advised conservative management.

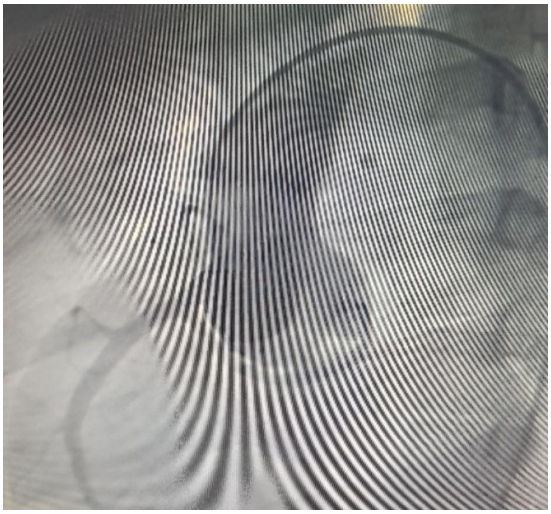

Fig. 1. Cuspal shoot showing single coronary artery

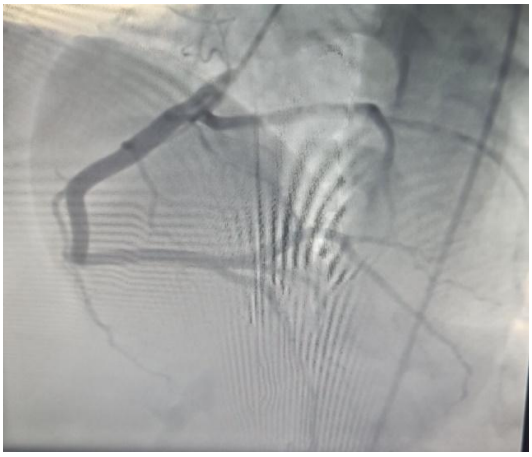

Fig. 2. Angiography showing single coronary artery

3. DISCUSSION

The term coronary originated from the latin word "corona" meaning crown. Coronary arteries are named according to the area they supply rather than the origin. Most common coronary artery variants include split RCA and ectopic origin of RCA near right aortic sinus. Siblings should also be screened as they may have increased

prevalence of coronary anomalies [2,3] Almost 12-20% of sudden cardiac death in young competitive atheletes is attributed to congenital coronary artery anomalies [4]. In children anomalous left coronary artery from pulmonary artery requires urgent surgical correction [5]. Single coronary ostium has got lesser mortality (14%) than other coronary anomalies but that originating from right (18%) has more mortality than left (9%) [4] Lipton et al. have classified anomalous coronary arteries according to their site of origin and anatomic distribution. They are classified into the “R” or “L” subtypes depending on whether the ostium originates from the right sinus or left sinus of Valsalva. Each type is divided into three groups (I, II, III) depending on the anatomical course of the artery. According to the relationship of the anomalous artery to the pulmonary artery and aorta they are classified into anterior [A], posterior [P] and in-between [B] patterns [6]. Our case was R II P according to the above classification.

Single coronary artery may be associated with congenital structural cardiac anomalies like tetralogy of Fallot, patent truncus arteriosus and pulmonary artery atresia [7]. It has also been shown to be associated with transposition of great vessels (TGA), bicuspid aortic valve and coronary arteriovenous fistula [8] Single coronary artery has also been seen to increase the development of cardiomyopathy, congestive heart failure and myocardial ischemia [9].

Only in a few cases blood flow is inadequate in resting state, most of the anomalies have no ischemia and only occasionally some anomalies have ischemia in exceptional clinical states [10]. Most cases are diagnosed at autopsy largely because of insufficient clinical suspicion and difficulties in implicit routine examination and clinical testing for these malformations [11]. Treatment options include conservative management, PTCA or surgical repair [12,13] Since our case was asymptomatic, he was managed conservatively.

4. CONCLUSION

Anomalous origin of coronary artery requires tailored treatment according to type and course of artery and is a rare anomaly. Patients with abnormal course on angiography should have a CT to rule out any malignant course.

CONSENT

All authors declare that ‘written informed consent was obtained from the patient for publication of this case report and accompanying images.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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