



# Absence of Circumflex Artery



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## Introduction

Even though anatomic variations in Coronary circulation are quite common, some of the variations are very rare. Right and Left coronary arteries which supply blood to the heart and they arise from the ascending aorta. Any coronary artery disorder may have serious implications by reducing the blood supply to heart which may lead to Myocardial infarction and death. Coronary arteries represent the only supply to the myocardium. They arise from ascending aorta. The two main coronary arteries are right and left coronary arteries. Right coronary artery originates from right anterior aortic sinus and left coronary artery originates from left posterior aortic sinus of Ascending Aorta. Patency of left coronary artery is vital for sufficient perfusion of the heart. The left coronary artery is responsible for supply of most of the left ventricle, but also considerable portion of right ventricle [1]. Left coronary artery bifurcates into left anterior descending and circumflex artery and passes between pulmonary trunk and left auricle.

The left anterior descending artery runs in the left anterior interventricular groove and ends at the apex or may course up to crux of the heart. Circumflex artery runs in the posterior atrioventricular groove and ends at the crux by anastomosing with right coronary artery or may end before the crux. Sometimes from Circumflex artery, Posterior interventricular artery may arise and may run in the posterior interventricular groove and termed as left coronary dominance. Numerous studies on the variations of the arteries have been reported, but still it is better to study them further with respect to their clinical significance. The incidence of congenital coronary artery anomalies is 5 – 6%. By definition, the term anomalous or abnormal is used to define any variant form observed in less than 1% of the general population [2]. The incidence of all coronary anomalies is 0.23% in autopsy series and ranges between 0.3 and 12% in Angiographic series [3].

## Discussion

Splanchnopleuric mesoderm contributes to all components of heart. The mesoderm contributes to the cardiac area that

occurs during 3<sup>rd</sup> week of embryogenesis. The cardiac area later forms a pair of endocardial tubes which fuses at the end to form primitive heart tube. Normal coronary artery arises from appropriate differentiation of pluripotent cells into their respective anatomic and functional components. Anomalies of the coronary circulation result from processes that disrupt the normal differentiation and specialization of heart tube [4]. Abnormal formation of heart tube which may lead to abnormal formation of coronary arteries. In particular, abnormal involution, position of endothelial buds or septation of truncus arteriosus may give rise to anomalous origin of coronary artery [5]. Coronary endothelial sprouts occur at around 5<sup>th</sup> week of Intrauterine life from the bulbous cordis from which blood vessels appear which has not yet differentiated into the aorta and pulmonary trunk. The first evidence of coronary vessel development is the appearance of the blood islands at the beginning of the 5<sup>th</sup> week just under the epicardium in the sulci of the developing heart. The prevalence of Absence of Circumflex artery is about 0.6 – 1.3%. This has been associated with systolic click syndrome, dilated cardiomyopathy and acute myocardial infarction [6]. Absence of Circumflex artery may be due to failure of development of left Circumflex artery in the left atrioventricular groove and may present as Bifurcated trunk of left coronary artery from which left anterior descending artery and diagonal artery arise. In the absence of Circumflex artery, 80% are benign and asymptomatic and 20% are clinically important [7].

## Conclusion

Anatomic variations of the heart vessels are common. Hence identification of normal coronary artery pattern and its branches and variations are important for cardiologists, cardiothoracic surgeons and radiologists while performing coronary angiography and surgical procedures. Coronary angiography is an imaging procedure which shows the identification of normal coronary arterial pattern and its variations in the coronary arteries. MDCT (Multi Detector Coronary Angiography) is the study to diagnose the Coronary artery anomaly including

Absence of Circumflex artery and to plan for surgery in associated conditions if needed. The angiography is useful in the diagnosis of chronic stable angina, variant angina, myocardial infarction and sudden cardiac death. Atherosclerotic lesions of Left anterior descending artery may be important in these patients because of diminished compensating mechanisms.

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