Case Report

Anomalous left main coronary artery (LMCA) arising from right coronary cusp: A case report

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Abstract

Coronary arteries show a wide variation in regard to their origin. This can also potentially have increased mortality risk. A 17 year old South Asian male with a history of exertional syncope for 2 years , presented with cardiac arrest and was found to have anterior STEMI. Coronary angiography revealed an anomalous LMCA arising from the right coronary cusp. Computer tomography scan of the heart clearly delineated the abnormality. Following successful resuscitation and stabilization a staged surgical intervention was done with unroofing and re-implantation of the LMCA. Anomalous LMCA origin can have a variable presentation including exertional syncope, angina and sudden cardiac death. The exact mechanism leading upto these complications are however poorly understood. Further studies and guideline protocols are required to clearly define management and intervention. Conclusion: LMCA anomalous origin can have atypical presentations. The clinical relevance of this abnormality must be realized to potentially prevent and intervene before disastrous cardiac complications occur.

Introduction

Coronary artery anomalies represent a potentially fatal form of congenital cardiac pathology. Although rare in incidence, they constitute a diverse group of anatomic variants with variable presentations and clinical impact. Anomalous origination of a coronary artery from the opposite coronary sinus is a subgroup with high risk for sudden cardiac death[1]. We report a case of a patient with anomalously originating LMCA from the right coronary cusp (RCC), who presented with a life-threatening cardiac event.

Case History

A 17 year old boy was admitted with a cardiac arrest while running and was successfully resuscitated at the local hospital. He was managed as anterior ST elevation myocardial infarction with ventricular tachycardia. He had a history of exertional syncope (few episodes) two years ago, and underwent 2D echocardiography, Holter monitoring and Exercise ECG which were all normal. He was asymptomatic afterwards until the current presentation.

He was intubated and ventilated, thrombolysed with streptokinase and was transferred to a tertiary care hospital for specialized cardiology management. The coronary angiogram revealed minor coronary artery disease with an anomalous origin of LMCA from right coronary cusp(RCC).

Subsequent computed tomography coronary angiogram confirmed the diagnosis of the anomalously originating LMCA with an inter-arterial course between aorta and main pulmonary artery in a narrow space (Figure 01), with no atherosclerotic disease.

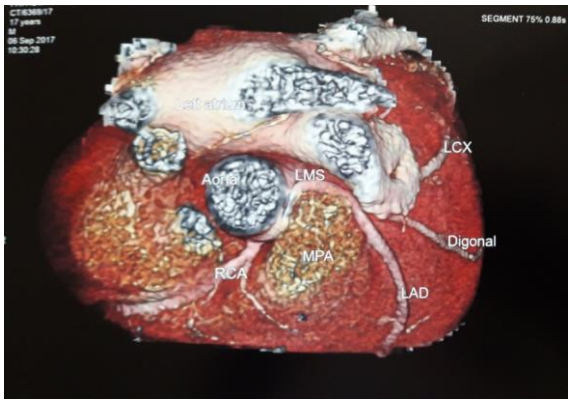

Figure 01- CT coronary angiogram (3D reconstruction)

Following close monitoring in the intensive care unit, the patient made a gradual recovery with improved left ventricular function and was subsequently referred for surgical correction of LMCA. Un-roofing of the anomalous origin of LMCA and re-implantation to the posterior sinus was done with an excellent clinical outcome.

Discussion

The possible clinical presentation of anomalously originating LMCA include dyspnoea, palpitations,

syncope, angina pectoris and sudden cardiac death specially associated with exertion in young adults[1]. The exact mechanism of death related to coronary artery anomalies is a topic of debate with multiple proposed theories. Lateral compression by dilated major vessels during exercise is one postulated mechanism[2]. However the risk for sudden cardiac death has not been quantified in studies. Therefore a fundamental challenge upon diagnosing a coronary anomaly is to decide on its likelihood of interfering with normal blood flow[1].

There are four different anatomic configurations of the aberrant LMCA arising from RCC, described depending on its course in relation to the major vessels; i.e posterior/retroaortic, inter-arterial, anterior/pre-pulmonic and septal/sub-pulmonic[3]. Among these, the inter-arterial course of LMCA, which the above patient had, is known to be the most insidious variant[4]. However the symptoms and clinical consequences do not always correlate with the anatomic delineation. Even the reportedly benign variants can give rise to severe symptoms[4].

The true prevalence of coronary artery anomalies in the general population is known to be under-recognized[4]. Given the rarity of occurrence, it would not be practical or cost-effective to screen the population for coronary anomalies. However, the incidence and clinical outcomes of individual types of coronary anomalies need to be discussed in order to establish management guidelines. Indications for surgery in these patients remain debatable and depend on multiple individual patient and disease factors[1]. However given the age and presentation with the life threatening cardiac event in our case, surgical correction was highly justifiable.

Conclusion

Coronary artery anomalies are an important cause of sudden cardiac death. Anomalously originating LMCA may clinically present as exertional syncope.

References

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