Review of Single Coronary Artery with Report of Two Cases

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ABSTRACT

Introduction: Anomalies of the coronary artery are found incidentally in around 0.1-3% of healthy individuals. Single coronary artery is an extremely rare anomaly and is seen in only 0.0024%– 0.044% of the population.

Case Series: First case:- A 53 year old woman presented with unstable angina. The patient had progressive retrosternal chest discomfort since 2 months, which was aggravated on exertion. Second case :- A 65-year-old man presented with retrosternal chest pain of two days duration, which was associated with vomiting and diaphoresis.

Conclusion: We have reported a rare case of SCA, which is rare congenital abnormality. Patients in this rare disorder are asymptomatic or may become symptomatic on excretion or may present with chest pain, ventricular fibrillations or MI. Gold standard diagnosis of SCA is coronary angiography.

Keywords: Anomalies of the Coronary Artery Disease.

INTRODUCTION

Anomalies of the coronary artery are found incidentally in around 0.1-3% of healthy individuals[1]. These might be asymptomatic, but can be a cause of chest pain and in some cases can cause significant hemodynamic consequences and sudden cardiac death[2]. Single coronary artery is an extremely rare anomaly and is seen in only 0.0024%– 0.044% of the population[3]. In this anomaly only one coronary artery arises with a single ostium from the aortic trunk[2]. SCA is commonly associated with other congenital cardiovascular anomalies such as transposition of the great vessels, coronary fistulas, bicuspid aortic valve and tetralogy of Fallot[4,5].

CASE SERIES

First case- A 53 year old woman presented with unstable angina. The patient had progressive retrosternal chest discomfort since 2 months, which was aggravated on exertion. There were few episodes of associated palpitations. The patient did not have any other co-morbid conditions. On examination the vitals were stable and the physical examination was otherwise unremarkable. Cardiac troponin was negative, the complete blood count and metabolic profile were normal. Electrocardiogram showed normal sinus rhythm, with non-specific T-wave changes. Echocardiogram showed normal left ventricular function and no segmental wall motion abnormalities. Her clinical condition was suspected to be caused by coronary arterial disease, so she was further investigated by coronary CTA.

On CTA a common trunk is seen arising from the right coronary cusp that is seen dividing into the RCA and another vessel (equivalent of the LCA). This vessel after its origin from the right coronary cusp hooks posterior to the aorta, reaching between the aorta and the left atrium, thereafter dividing into the LAD and LCX at the level of the aortic root. These findings are suggestive of type of Lipton's classification

The branches of LAD and LCX have a normal course with no stenosis.

The RCA and its branches have a normal course with no stenosis.

The patient was managed conservatively with emphasis on aggressive control of risk factors.

Second case- A 65-year-old man presented with retrosternal chest pain of two days duration, which was associated with vomiting and diaphoresis. The patient had co-morbid conditions in the form of hypertension and the patient was evaluated at another center where he was diagnosed as a case of inferior wall myocardial infarction and underwent IV thrombolysis. On evaluation at our center the vitals were stable, patient had pedal edema, raised JVP and bilateral basal crepitations. Rest of the physical examination was unremarkable. The electrocardiogram revealed T wave inversion in lead II, III & a VF and ST depression in chest leads V2 to V6. Echocardiogram revealed LVEF of 45%, mid basal, septal, inferior & posterior wall hypokinesia with moderate mitral and tricuspid regurgitation.

The patient underwent PCI and it showed a single coronary artery arising from the right coronary sinus. The LMCA was arising from the right coronary artery.

CT angiography was performed to evaluate the course of the LMCA which showed.

DISCUSSION

Single coronary artery is a rare congenital anomaly with a quoted incidence of 0.024% to 0.044% [6]. Although a single coronary may be compatible with life expectancy, patients are at increased risk for sudden deaths if major coronary branch crosses between the pulmonary artery and the aorta. In addition, proximal stenosis of a single coronary artery may be devastating if there is an inability to develop collateral channels.[7] Conginital cardiac structural deformities associated with SCA include pulmonary artery artresia,

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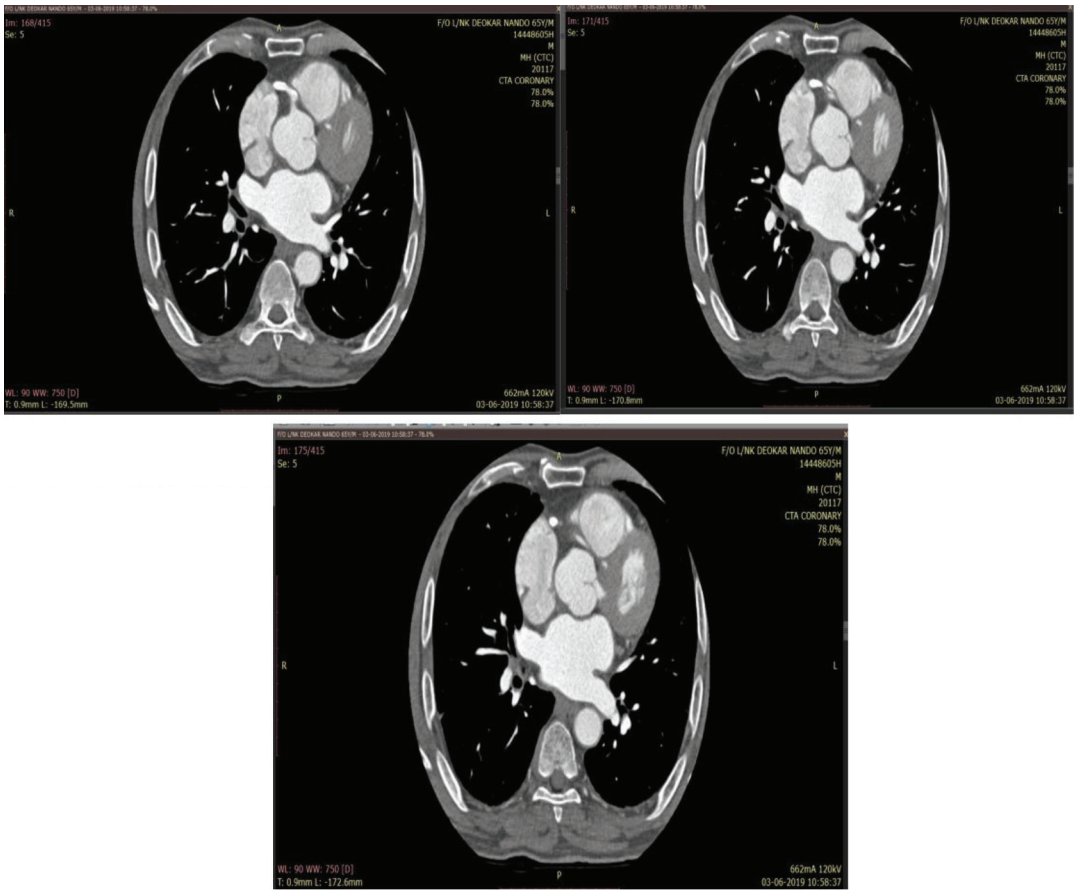

Figure-1: Single coronary artery

Table 1 Lipton's classification of single coronary artery

Originating from right cusp	Description	Originating from left cusp
RI	Solitary vessel arising from either the left or right coronary cusp, following the course of either a normal right or left coronary artery	LI
RIIA RIIIB RIIP	Divided into 3 types depending on the relationship of the aberrant vessel to the great vessels. Type A courses anterior to the pulmonary trunk. Type B travels between the aorta and pulmonary trunk. Type P travels posterior to the aorta	LIIA LIIB LIIP
RIII	Absent left coronary artery with the left anterior descending and circumflex arteries arising from the common trunk originating from right coronary cusp	

teratology of Fallot, and patent truncus arteriosus.[8]

Incidence of RCA arising from the left coronary vasulature ranges from 0.1 to 0.9% with ,most of the published case reporting RCA originating from the proximal or middle portion of the LAD[9,10].

Several classification systems for coronary artery abnormalities exist. Lipton et al [11]

Originally proposed the angiographic classification of SCA, which was later modified by yamaka et al. The classification takes account the origin of the ostium from the sinus of valsalva, anatomical course of the vessel and the course of the transverse trunk. Alphabets R or L are used to identify the ostial origin of the vessel, roman numerals I,II or III are used to represent the anatomical distribution of the vessel , and the letters A,B,P,S and C are used to delineate the course of the vessels with respect to the pulmonary artery and the aorta.[12]

Most of the patients are asymptomatic at the time of diagnosis, and cases of SCA are usually found incidentally on coronary angiography. Many patients might have atypical chest pain or non-specific symptoms, with absence of obstructive coronary artery disease and negative workup for ischemia[13].Coronary angiography remains the gold standard for diagnosis and classification. Echocardiography is useful mainly to delineate other structural abnormalities accompanying the SCA. Computed tomography angiography offers a less invasive imaging modality despite requiring administration of contrast media[14].

Treatment options include conservatives' medical management, percutaneous coronary intervention with stent placement and surgical correction. Most patients are

asymptomatic do not require invasive therapy and should be managed with strict control factors.

Taylor et at[5] looked at the records of the 242 deceased patients with isolated congenital coronary anomalies and found one third of patients suffered sudden cardiac death, and half of these were exercise related deaths. Patients younger than 30 years of age were significantly more likely to suffer from sudden cardiac deaths as compared to older patients. Younger patients were also more likely to die suddenly during physical exertion.

CONCLUSION

We have reported a rare case of SCA, which is rare congenital abnormality. Patients in this rare disorder are asymptomatic or may become symptomatic on excretion or may present with chest pain, ventricular fibrillations or MI. Gold standard diagnosis of SCA is coronary angiography.

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