CASES OF SINGLE CORONARY ARTERY
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PRESENTATION OF CASE
Case-1
A 56-year-old hypertensive male presented to the cardiology department with a complaint of shortness of breath on climbing stairs since 2 months. On physical examination, his blood pressure was 100/70 mmHg, heart rate was 69 beats/minute, respiratory rate was 20/minute and body temperature was 98.4°F. He didn't have any past or familial cardiovascular history. On further examination, he displayed a positive treadmill test (stress test). The ECG and echocardiogram were normal. The biochemical examination showed LDL cholesterol of 200 mg/dl and serum triglyceride of 440 mg/dl. He was diagnosed to have chronic stable angina.

The coronary angiography was performed via right radial artery, which revealed the presence of anomalous origin of coronary arteries. It divulged that coronary artery arose anomalously from the single right coronary sinus and left and right coronary arteries were sharing a common ostium. On selective injection to the left coronary sinus, it disclosed that no coronary artery arose from left sinus. No evidence of stenosis or atherosclerotic lesions was observed (Figure 1). Hence, he was discharged on the same day as was stable with no complications. The medical therapy for the patient included rosuvastatin 20 mg/day.

Case-2
A 54-year-old hypertensive female presented to our hospital with complaint of chest pain since last 10 days. She underwent mitral valve replacement surgery before 10 years. Earlier before 1 year, she confronted cerebrovascular accident with left parietal infarct. Her 2D-echocardiography showed good left ventricular systolic performance. Coronary angiography was performed which discovered presence of single coronary artery originating from left sinus of Valsalva. It revealed existence of anomalous right coronary artery (RCA) originating from dominant left main coronary artery (LMCA). Her coronary angiogram also disclosed the presence of 60-70% lesions in mid and 80% lesion in distal anomalous RCA. So, percutaneous coronary intervention to distal anomalous RCA was planned via femoral route. LMCA was engaged with 6Fr EBU 3.0 guiding catheter. The lesion was crossed with run through wire and the tip of the wire was placed in distal RCA. The lesion was predilated with 2.0 × 8 mm and 2.5 × 8 mm balloon at 14 atm. for 20 seconds. Subsequently, the lesion was stented using 2.5 × 16 mm Yukon Choice stent (Translumina Therapeutics, India) at 14 atm. for 20 seconds. At the end of the procedure, good TIMI-III flow was obtained without any dissection or residual lesions (Figure 2). On follow up visits, patient was asymptomatic and doing fine.

DIFFERENTIAL DIAGNOSIS
- Anomalous Single Coronary Artery
  - Single coronary artery arising from right sinus or left sinus and have common ostium.
  - Both right and left coronary artery arising from single sinus (either left or right) but have different ostium.
- Left Main Coronary Artery Atresia
- Right Coronary Artery Atresia

CLINICAL DIAGNOSIS
Case-1
Single coronary artery originating right aortic sinus sharing same ostium (Type: R-II).

Case-2
Single coronary artery originating left aortic sinus sharing same ostium (Type: L-II)

DISCUSSION OF MANAGEMENT
Congenital coronary artery anomalies are present at birth, but most probably remain asymptomatic.¹² The congenital coronary artery anomalies are broadly classified as aberrations of coronary artery origin, course, size or number of vessels. In Indian population, the prevalence of coronary artery anomalies was found to be 0.95%.³ Pervasiveness of coronary artery anomalies includes 1.2% in angiographic series and 0.17% in autopsy series.³ One of the rare coronary artery anomalies is occurrence of single coronary artery in which both left and right coronary arteries arises from single sinus of Valsalva and supply blood to the entire heart. Single coronary artery is the abnormality of coronary artery origin and it represents around 2-4% of all coronary anomalies. It refers to an isolated coronary artery which...
originates from the single aortic sinus through a single ostium. Though rare, it is not devoid of life-threatening symptoms, such as myocardial ischemia, arrhythmias, syncope or sudden cardiac death. Usually, all these symptoms develop at the younger age mainly before forties. Lipton MJ, et al.7 and Yamanaka O, et al.8 have classified SCA anomalies based on their origin (right or left aortic sinus) and the anatomical course (I, II or III) in regards with ascending aorta and pulmonary trunk.

Here, we present two cases of single coronary artery originating from different sinuses in each individual. According to the classification of single coronary artery by Lipton MJ, et al.7 and Yamanaka O, et al.8, in the present cases, single coronary artery arising from right aortic sinus (case-1) was classified under R-II pattern and single coronary artery arising from left aortic sinus (case-2) was classified as L-II pattern. In first case, the main single artery from right aortic sinus gives off two main arteries i.e. right coronary artery and left main coronary artery which further bifurcate into left anterior descending artery and left circumflex artery. However, in second case, the main single artery from left aortic sinus gives off separate right coronary artery, left descending artery and left circumflex artery.

In almost 40% of cases, single coronary artery is encountered with other congenital cardiac abnormalities such as persistent truncus arteriosus, tetralogy of fallot, transposition of great arteries, coronary arteriovenous fistula or bicuspid aortic valve. But, in our cases no such other anomalies were reported along with single coronary artery. However, various cases of single coronary artery with other congenital anomalies have been reported. Furthermore, in the study by S Turkmen et.al, total 215,140 patients who underwent coronary angiography were studied and from that 67 (0.031%) patients were diagnosed with single coronary artery. They found that highest numbers of single coronary artery were detected in patients with age of 40-49 years. However, in present cases both the patients were incidentally diagnosed in their mid-fifties. Furthermore, in the first case, there was no evidence of stenosis or atherosclerotic lesions. Both patients were stable without any severe complications even at the 5th decade of life despite of having anomalous single coronary artery which was very rare.

Figure 1: Representative images of case-1: (A) and (B) Caudal and Cranial view of right coronary sinus - origin of the LMCA artery from the ostium of the RCA, respectively and (C) Cranial view of left coronary sinus- absence of left coronary artery in the left sinus.

Figure 2: Representative images of case-2: (A) Coronary angiogram showing single coronary artery originating from left coronary sinus, (B) 80% stenosis in distal RCA before the bifurcation, (C) The lesion was pre-dilated with 2.00 x 8 mm and 2.50 x 8 mm balloon at 14 atm. for 20 seconds, (D) 2.5 x 16 mm Yukon Choice SES deployed in the distal RCA and (E) Final post-procedure TIMI-III flow.

REFERENCES


