

## AN ANOMALOUS CORONARY ARTERY CASE AT LIAQUAT NATIONAL HOSPITAL, KARACHI

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**ABSTRACT:** Anomalous Circumflex Coronary Artery, originating from right coronary sinus is a rare entity. A 50 years old male admitted to coronary care unit with acute coronary syndrome and shock. Prognosis was good with early intervention. With six month follow-up showed no recurrence and patent coronary artery with stent. This procedure significantly improved patients' in a cost effective manner.

**KEY WORDS:** Anomalous coronary artery, Non-STEMI, Shock, Early intervention.

### INTRODUCTION

Anomalous Coronary Artery (ACA) is a rare instance which is present in less than 1 % of normal population (Shirani, 2002). It refers to a wide range of congenital abnormalities including the origin, course and structure of epicardial arteries. It is associated with sudden death, myocardial ischemia, congestive cardiac failure, or endocarditis.

Normally the two coronary arteries arise from right & left coronary sinuses. The left coronary artery originates as a single trunk of different length and sizes, divides into left anterior descending artery running into anterior interventricular sulcus and provides many branches like diagonal and septal, and circumflex coronary artery which runs in the left atrioventricular groove, gives obtuse marginal and or left posterior descending artery.

The right coronary artery runs in right atrioventricular groove to reach up to crux of the heart and give rise to different branches including atrioventricular nodal artery (A V Nodal) (90% and 10% from left circumflex in the normal population) and posterior descending artery (PDA). The right and left dominance depends upon A V nodal & PDA origin (Gray's Anatomy, 61h edition)

The anomalous coronary artery is usually silent and is detected upon on routine angiography. Hence coronary angiography is the diagnostic and conclusive tool for the confirmation of anomaly. The angiography requires expertise and sometimes special catheters to have better pictures. Once the lesion is diagnosed it should be dealt earlier to have good prognosis which was done in this case where patient presented with ACS and shock.

### CASE REPORT

Fifty (50) years old male patient admitted to coronary care unit with typical history of acute coronary syndrome, he had retrosternal burning of intense nature, radiating to both arms, jaw, neck, in the previous night which awoke the patient. He was experiencing same complaints on exertion earlier but ignored.

Patient denied having any history of Ischemic Heart disease, Diabetes mellitus, Hypertension, or Smoking. There was no other risk factor like obesity, sedentary life style as he was an active company employee. Until recently he was enjoying a good health.

Initial examination revealed shock like state with hypotension of blood pressure 80/50, tachycardia of 120 bpm, no gallop.

Electrocardiograph showed ST segment depression of 2-3mm in inferior and lateral leads.

Troponin was mildly raised, other laboratory parameters or chest X-ray did not show any anomaly. He was stabilized with inotropic support, Heparin, Aspirin, Clopidogrel and supportive therapy. His Echocardiography showed normal left ventricular function with no segmental wall motion abnormality (SWMA).

In view of ACS & Shock he was advised for an early intervention, which he accepted.

His coronary angiography was done by left Judkin JL 4 6F catheter for left system showed normal left main artery and normal course of left anterior descending artery with 30-40% stenosis (Figure 1). Circumflex was not visualized on left injection. Circumflex & Right coronary artery was visualized by using Right

Judkin JR4 6F catheter. Left circumflex coronary artery had anomalous origin & originating from right coronary sinus with 80% stenosis in the proximal segment (Figure 2). His left ventricular function was normal.

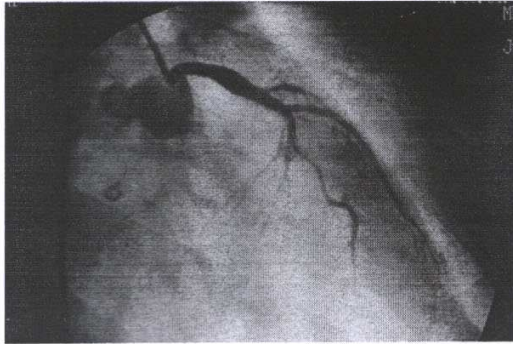


Figure 1. Left main coronary artery and Left anterior descending artery.

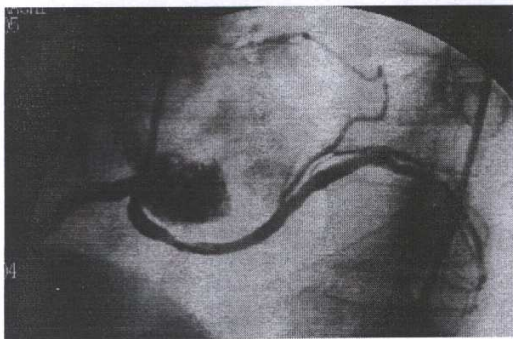


Figure 2. Anomalous origin of LCX from Right coronary sinus shows proximal lesion.

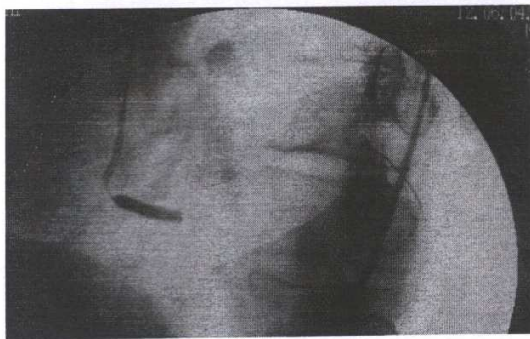


Figure 3. Stent in Left anomalous CX artery.

Anomalous CX artery angioplasty was done by using Guiding Catheter JR 46F and then passing floppy wire without any difficulty, over the wire direct 2.75x12mm metallic stent was placed at the lesion and inflated at different ATMs thereafter patient's condition improved (Figures 3 & 4).

He was discharged after a couple of days. He was ambulatory after full mobilization, on Aspirin, Clopidogrel, both bloker, statin, Ace inhibitors. In his regular follow-ups, he had no more anginas.

After six month his repeat coronary angio was normal in the sense that stent showed no stenosis with patent anomalous circumflex coronary artery (Figure 5).

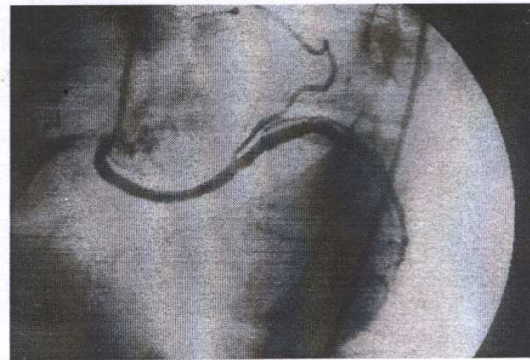


Figure 4. Post stent deployed Left anomalous CX.



Figure 5. Final result shows Right coronary artery and Left anomalous CX artery originating from the Right coronary sinus.

## DISCUSSION

The cardiovascular system embryologically starts in 3rd week of gestation as a pair of two cords, in the 4th week primitive vascular network is formed. In the 5th week coronary buds arise from truncus arteriosus which further converts into aorta & pulmonary trunk. The luminal continuity between proximal coronary buds and distal epicardial vessels forms in the 6th week, & normal coronary circulation assumes its normal configuration (George *et al.*, 2004).

The incidence of anomalous aortic origin of the coronary arteries is less than 1 % (Shirani, 2002) in the general population coming for coronary angiography. The incidence of left circumflex anomalous origin was reported by Chaitman *et al.* (1976), Page *et al.* (1974), Engel *et al.* (1975), Dermetrios *et al.* (1978), 0.45%, 0.67%, 0.7%, and 0.37% respectively.

The most common anomaly seen is the origin of left circumflex coronary artery & in one of the angiographic series it was found about 57.8%, (overall 0.67%) usually the distal vessel follows the normal pathway. Page *et al.* (1974) have described the &quot; aortic sign & rsquo; in which a profile view of the anomalous CX artery, coursing posteriorly behind the right sinus of Valsalva, is demonstrated during left ventriculography in right anterior oblique projection.

Aberrant origin of left Cx coronary artery is suspected when left main injection showed a vessel with a long initial non branching segment. Page *et al* called this appearance a sign of nonperfused myocardium. In case separate origin of CX or short left main slight LAO position for injection will clear it. Selective injection can be given by rotating slightly catheter posteriorly.

The association of anomalous origin of coronary arteries with coronary artery disease is difficult to assess exactly, however, there is high incidence of valvular heart disease measuring about 31 %. Although this anomaly is not reported with sudden death and is taken as benign which doesn't alter myocardial perfusion but it should be noted in coronary artery disease especially in obstructive coronary artery disease and valve surgery.

One of the contraindication for thrombolytic therapy is shock, advanced age, late presentation, and prior by

pass surgery or bleeding disposition as reported by Cragg *et al.* (1991). In this patient, shock was the indication of early intervention. One of the major benefits of early intervention is that it can be applied to large number of patients with least complications with experienced hands and early mobilization of the patient & minimum hospital stay. The only contraindications are lack of vascular access, renal impairment and active bleeding. Early intervention definitely improves the mortality and morbidity. This procedure does not only improve the health but it is cost effective and cheap method as well.

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