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Successful PCI of Anomalous Left Circumflex Coronary Artery Arising from Right Coronary Sinus – A Case Report

Gurkirat Singh[1*], Hemant Khemani[1], Shakil Shaikh[1] and Narender Omprakash Bansal[1]

[1]Department of Cardiology, Grant Medical College and Sir J.J. Group of Hospitals, Mumbai, India.

Authors' contributions

This work was carried out in collaboration between all authors. Author GS designed the manuscript, provided the clinical finding, the laboratory findings and images for the study and wrote the first draft of the study. Authors HK and SS managed the literature searches. Author NOB revised the manuscript. All authors read and approved the final manuscript.

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Case Report

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ABSTRACT

Coronary artery anomalies occur in 1.3-5.6% of patients undergoing coronary arteriography. An anomalous origin of LCX from right coronary sinus is the most common congenital variant. It is usually considered "benign" since it is not known to predispose individuals to sudden cardiac death. Such vessels are particularly predisposed to atherosclerotic disease in their proximal portion, due to the acute angulation of its origin from the aorta and its posterior retro aortic course. We present a case of 55 years old female admitted with acute coronary syndrome. Coronary angiogram showed the anomalous origin of the left circumflex artery from right coronary sinus. This artery had a significant lesion which was successfully stented with a drug-eluting stent.

Keywords: Anomalous LCX; acute coronary syndrome; PCI.

**Corresponding author: E-mail: singhgs269@yahoo.com;*

ABBREVIATION

LCX : Left Circumflex Artery;
RCA : Right Coronary Artery;
LAD : Left Anterior Descending Artery;
PCI : Percutaneous Coronary Intervention.

1. INTRODUCTION

Coronary artery anomalies occur in 1.3-5.6% of patients undergoing coronary arteriography [1, 2]. An anomalous origin of LCX from right coronary sinus is the most common congenital variant with prevalence at coronary angiography of 0.18%-0.67% [1,2,3,4]. It was first described by Antopol and Kugel in 1933 [5]. It is usually considered "benign" since it is not known to predispose individuals to sudden cardiac death [6]. The clinical significance of this anomaly is that it may pose considerable challenges and technical difficulties for the interventional cardiologist during the percutaneous coronary intervention. The recognition and adequate visualization of this anomaly is essential for proper patient management. We present a case of 55 years old female admitted with acute coronary syndrome. Coronary angiogram showed the anomalous origin of the left circumflex artery from right coronary sinus. This artery had a significant lesion which was successfully stented with a drug-eluting stent.

2. CASE REPORT

55-year-old female, diabetic since 10 years, hypertensive since 15 years, admitted with acute onset of left-sided chest pain, associated with sweating since 5 hours. She also had a history of acute coronary syndrome 1 year ago, for which she was admitted in other hospital and PCI to LAD with 2 stent was done at that time. On examination, pulse was 84/min and blood pressure was 148/92 mmHg. Cardiovascular and respiratory system examination was normal. Electrocardiogram showed down sloping ST depression and T inversion in II, III, aVF and V3-V6 (Fig. 1). Echocardiography showed no regional wall motion abnormality and an ejection fraction of 60%. Qualitative Troponin T was positive. Routine blood investigations were normal. Coronary angiogram done through right femoral access showed LAD stents patent. Left circumflex artery was arising from right coronary sinus, had significant lesion (Figs. 2, 3). Right coronary artery was dominant, had a significant lesion.

Lesion in RCA was stented with 2.75 x 24 mm Everolimus-eluting stent after predilatation. Anomalous LCX was engaged with JR 3.5 6F catheter. The lesion was crossed with routine angioplasty wire and dilated with 2 x 12 Balloon. The lesion was then stented with 2.5 x 15 mm Everolimus-eluting stent. Check shoot after the procedure showed good result (Figs. 4, 5). The procedure was uneventful. The patient was discharged after 3 days. The patient is asymptomatic at 8 weeks follow up.

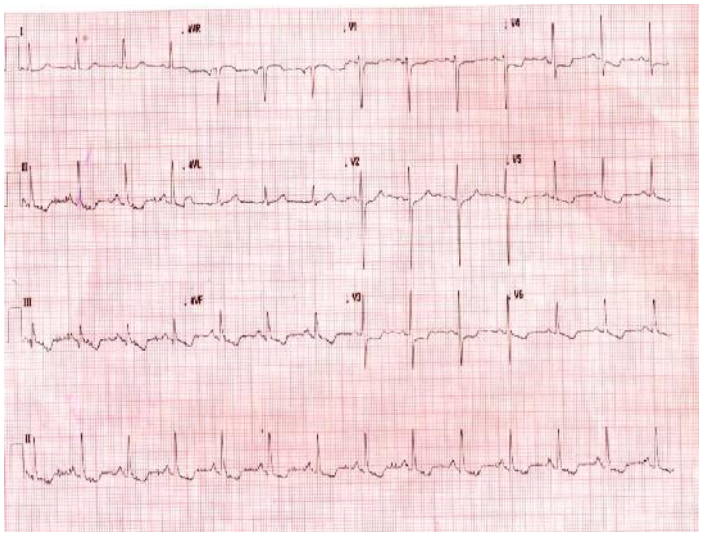

Fig. 1. ECG of the patient on admission, showing down sloping ST depression and T inversion in II, III, aVF and V3-V6.

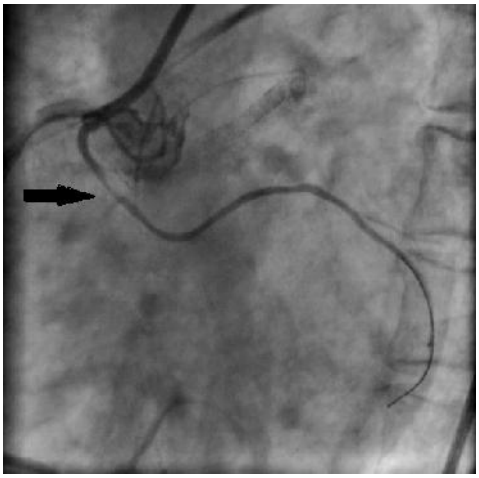

Fig. 2. Coronary angiogram in LAO view showing anomalous LCX originating from right coronary sinus. The significant lesion is marked by an arrow

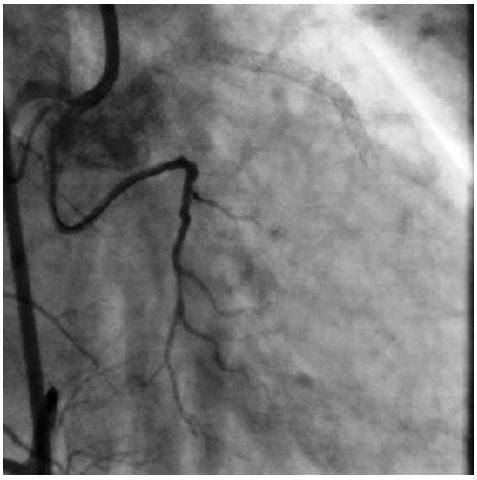

Fig. 3. Coronary angiogram in RAO view Showing Anomalous LCX originating from right Coronary sinus

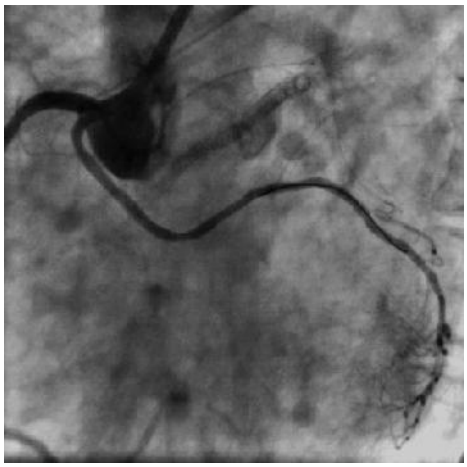

Fig. 4. Angiogram in LAO view after stenting shows good result

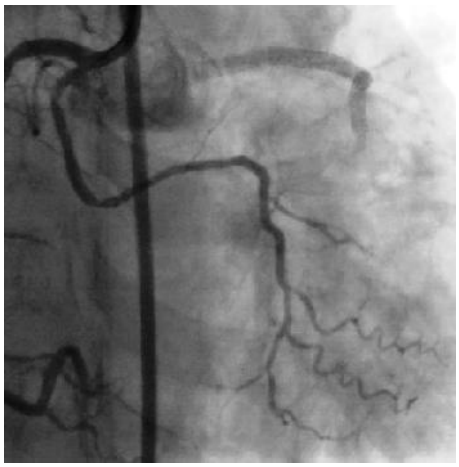

Fig. 5. Angiogram in RAO view after stenting shows good result

3. DISCUSSION

An anomalous origin of LCX from right coronary sinus is the most common congenital variant and is divided into three types [3]. Type I- Separate Ostia for RCA and LCX, Type II- Common ostia in the right sinus and Type III- LCX arising as a branch of the proximal RCA. Type I is most common, with a reported incidence of 0.41% [1]. Type II was present in our patient. It usually takes a posterior course to the great vessels before supplying the posterolateral surface of the left ventricle. This retro-aortic posterior course has been proposed to be a contributing factor in the development of atherosclerosis in anomalous LCX. Two angiographic signs have been described [3]. One sign is a profile view of the artery behind the aortic root during left ventriculography (the 'aortic root sign'), and the other sign is a recognition of absent arterial inflow to a significant area of the posterior lateral left ventricle during selective injections of the main left coronary artery (the 'sign of non-perfused myocardium').These signs have proven to be reliable in recognizing the anomalous artery before its selective demonstration. These vessels are generally small, with a mean vessel diameter of only 2.20 mm (range, 1.3-3.9 mm) [6]. The majority of significant lesions involving the anomalous LCX appear to be confined to the proximal to mid-body of the vessel.

The clinical significance of this anomaly is that it may pose considerable challenges and technical difficulties for the interventional cardiologist during the percutaneous coronary intervention. The first case series of PCI performed on anomalous LCX was described in 1982 [7]. The selective cannulation of anomalous LCX can be technically challenging and time-consuming. Most available catheters are designed for usual coronary anatomy. Multipurpose guide catheter and Amplatz left guide catheter are ideal for engaging Anomalous LCX. Judkins right guide catheter can be used, but requires considerable manipulation. The second challenge is wiring the anomalous LCX lesion. During the wiring of anomalous LCX, the catheter may disengage multiple times. By wiring the RCA first and using the "push the knuckle" technique, a safe and elegant positioning of the guide catheter at the bifurcation, and further intervention, can be achieved easily and effectively [8].

4. CONCLUSION

An anomalous origin of LCX from right coronary sinus is the most common congenital variant. It is usually considered "benign" and asymptomatic. The anomalous LCX most commonly arises from a separate ostium within the right sinus. The clinical significance of this anomaly is that it may pose considerable challenges and technical difficulties for the interventional cardiologist during the percutaneous coronary intervention.

CONSENT

Written informed consent was obtained from the patient for publication of this report and any accompanying images.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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