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Congenital Absence of Left Main Coronary Artery with Anomalous Origin of Left Anterior Descending and Left Circumflex Arteries Presenting with Acute Non-ST Elevation Myocardial Infarction

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Abstract Congenital coronary artery anomalies are rare disease entities, occur only in 0.3%-5.6% of the general population. These anomalies could lead to serious complications in some cases and is associated with associated with sudden death due to lethal arrhythmias and premature coronary artery disease. Diagnosis of these anomalies is generally made during angiography. In this report, we present a rare case of absent left main coronary artery and anomalous origins of left anterior descending artery and left circumflex artery from right sinus of Valsalva in a 62 year old man presented with non-ST elevation myocardial infarction (NSTEMI).

Keywords: *congenital absence of left main coronary artery, anomalous origin of left anterior descending and left circumflex arteries, acute non-st elevation myocardial infarction*

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1. Introduction

Congenital coronary artery anomalies are defined as a coronary pattern that is found in less than 1% of the general population, with a prevalence ranging from 0.3%-5.6% [1]. In few types of the anomalies, there is an association with sudden death and premature coronary disease [2]. Congenital absence of left main coronary artery (LMCA) and anomalous origins of left anterior descending artery (LAD) and left circumflex artery (LCX) arising from right sinus of Valsalva is rarely reported. Here we are presenting a 62-year-old male who presented with non-ST NSTEMI who found to have anomalous absence of left main coronary artery and anomalous origins of left anterior descending artery and left circumflex artery from right sinus of Valsalva.

2. Report of the Case

62 years old man with past medical history of hypertension, dyslipidemia and type II diabetes mellitus presented with acute chest pain. The pain started suddenly, pressure like, at the left side, 9/10 in intensity, radiates to left arm and was associated abdominal discomfort, nausea and diaphoresis. The pain was relieved by sublingual nitroglycerin. Electrocardiography showed tall positive T waves at inferior leads (Figure 1). His troponin was initially 0.5 ng/L then increased after 4 hours to 1.2 ng/L. He was started on aspirin, clopidogrel and heparin. Transthoracic echocardiography showed ejection fraction estimated to be 60% without wall motion abnormality. He was taken for cardiac catheterization, which showed 95% occlusion of proximal left circumflex artery (LCX) and 60% occlusion of distal Left anterior descending artery (LAD). LCX and LAD were originated from right coronary cusp (Figure 2). He was treated with drug-eluting stent for proximal LCX (Figure 3). He was discharged on aspirin and ticagrelor in a stable medical condition.

3. Discussion

Coronary heart disease one of the leading causes of death in developed countries [3]. Congenital coronary artery anomalies are relatively rare entities with a prevalence that is reported to be approximately 0.3%-

5.6%. The variation in prevalence is likely explainable by the diversity of the study populations [1]. Studies suggest that congenital coronary artery anomalies are the second most common cause of sudden death in young athletes, likely due to premature coronary disease [2]. Based on predisposition to CAD, congenital coronary artery anomalies are classified into 3 major groups: first: anomalies that predispose to ischemia such as coronary vessels originating from right atrium; second: anomalies that do not predispose to ischemia, as in anomalous origin of right coronary artery from posterior sinus of Valsalva; third: anomalies that might predispose to ischemia as in congenital absence of LAD [4]. It is usually diagnosed incidentally by CT coronary angiography, interventional coronary angiography, and in some severe and unusual cases, by transthoracic or transesophageal echocardiography, particularly in pediatric populations [4].

In our case, the patient has multiple anomalies: congenital absence of the left main coronary artery (LMCA) which was reported in 0.41%-0.67% of the cases [5]. It is, in most of the cases, clinically benign. However, an association with myocardial infarction and syncope were reported [6]. The second one is anomalous origins of left anterior descending artery (LAD) and left circumflex artery (LCX) from right sinus of Valsalva, were report separately as 0.03% and 0.032% respectively. The combination of both is extremely rare. The clinical significance of this anomaly is according to the course of the LAD. The possibilities of LAD course are: pre-pulmonic anterior to the right ventricular outflow tract which rarely causes ischemia; retro-aortic posterior to the aortic root, as in our case, usually benign; inter-arterial between the aorta and pulmonary artery, often associated with unfavorable outcomes; trans-septal subpulmonic course, which rarely causes ischemia; and retro-cardiac in the posterior atrioventricular groove, which predisposes to coronary disease [6]. The other aspect of the anomaly management is technical difficulties of coronary angiography and percutaneous coronary intervention due to unexpected positions and difficult angles.

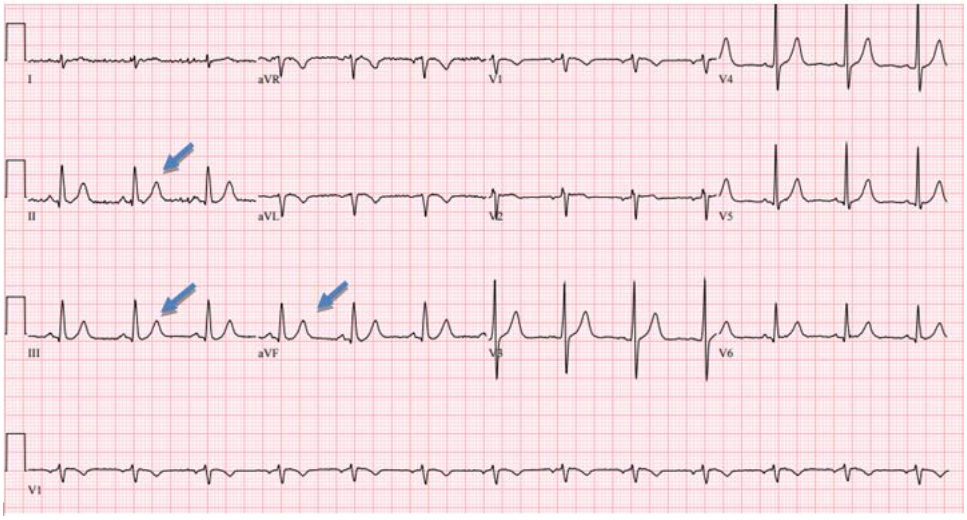

Figure 1. Electrocardiography showed tall positive T waves at inferior leads

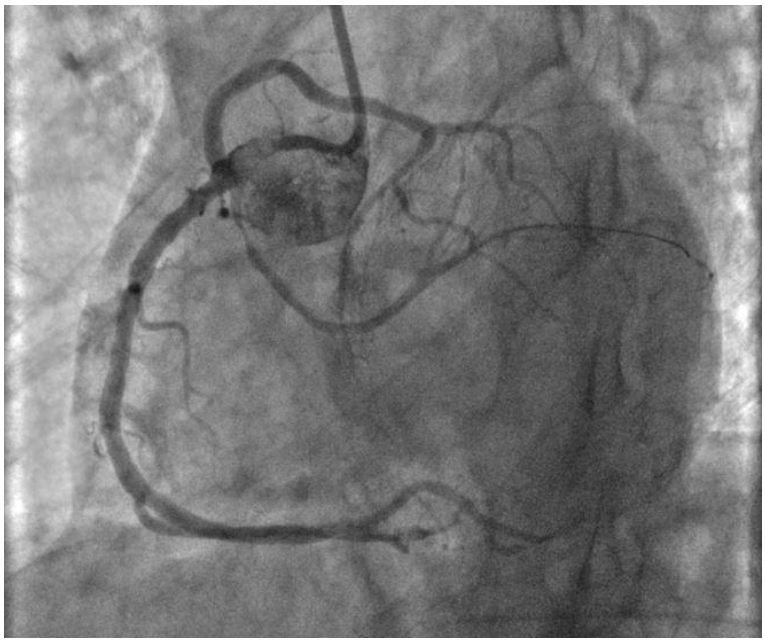

Figure 2. 95% occlusion of proximal left circuflex artery (LCX) and 60% occlusion of distal Left anterior descending artery (LAD). LCX and LAD originated from right coronary cusp

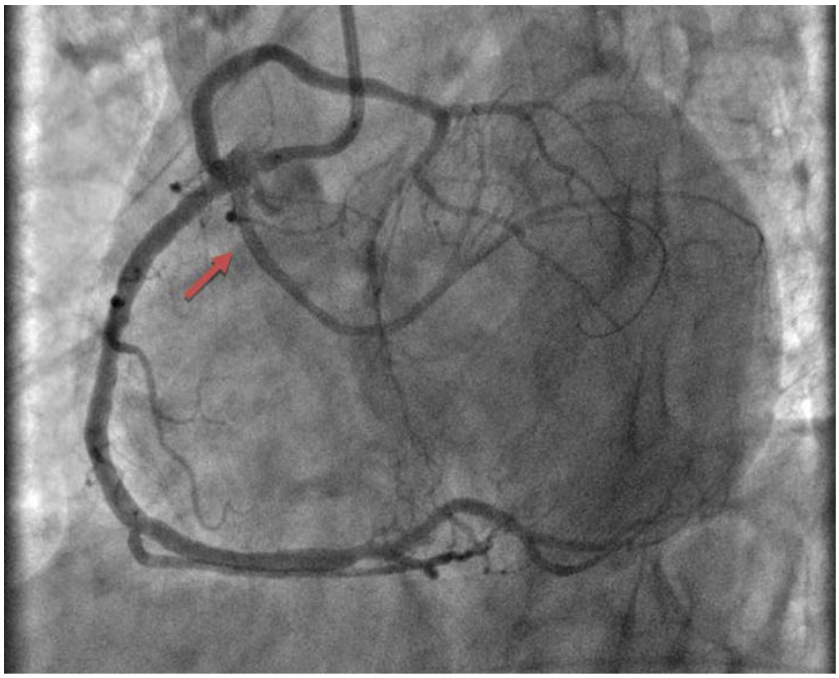

Figure 3. Drug-eluting stent for proximal LCX

4. Conclusion

We reported a case of combined anomalies of the coronary arteries including absence of Left Main Coronary Artery with Anomalous Origin of Left Anterior Descending and Left Circumflex Arteries that presented with NSTEMI. This combination of anomalies is exceedingly rare.

While congenital coronary artery anomalies are quite rare, these entities could result in acute coronary syndrome with technical difficulties during percutaneous coronary interventions. Our case report highlights the need to keep that possible diagnosis of congenital coronary anomalies in mind while managing patients with acute myocardial infarction.

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