

Dual Left Anterior Descending Coronary Artery Anomaly, Chronic Total Coronary Occlusion Perspective

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Abstract

Dual left anterior descending coronary artery is well-known as a congenital phenomenon of coronary artery anatomy. It may be confronted during daily coronary angiography and in unaware operators it may be misjudged as a chronic total occlusion lesion in short LAD branch. And in another concept if in a real chronic total occlusion situation of LAD what will be the strategy.

Keywords: Dual LAD anomaly; CTO intervention perspective

Introduction

Coronary artery anomalies represent about 0.64% to 1.3% of patients undergoing coronary angiography [1-3]. The left anterior descending coronary arteries (LADs) have rare variations in origin, course, and distribution, also the right coronary artery fairly shows such anomalous variations [3,4]. Approximately 1% of Moretti's cases were reported to show complete duplication of a coronary artery or one of its branches [5].

Objective

Demonstration of the Dual LAD anomaly and consideration of strategic approach when dealing with CTO in one branch of that anomaly.

Case Presentation

Our case is a female patient 54 years old diabetic, hypertensive and dyslipidemic on oral hypoglycemic, statins, Beta Blockers and aspirin, she presented to our clinic complaining from typical chest pain and minor ECG changes, cardiac markers was negative for 2 sets. Because of her high risk profile we advised to do Coronary angiography (Figure 1).

Discussion

It was a strange to distinguish angiographically the LAD course properly as if the LAD was divide into one which is short with tapered end giving septal perforators and another one which is long reach to LV apex giving diagonals. There were no significant lesions in our case.

Spindola-Franco and colleagues, 6 had reported the incidence of dual LAD in otherwise normal hearts is approximately 1%. The anomaly was described by an early division of the proximal LAD (the LAD proper) into one is too short to reach the apex; this "short LAD" stays in the anterior interventricular sulcus (AIVS). The second the "long LAD," reach to the apex, 1st along the AIVS, then leaving it, and then reentering the distal AIVS. However, 1 relatively frequent

variation consists of a long LAD that arises not from the LAD proper but from the right coronary artery. In this case, the short LAD arises from the LAD proper as described above and the long LAD courses outside the AIVS until it enters the distal AIVS. The LAD proper is the LAD segment that starts at the bifurcation of the left main stem and is so called until its level of bifurcation. Spindola-Franco and co-authors provided an angiographic description of the dual LAD important variants as follows [6]:

Type I: Both Short and long LAD run in AIVS the shorter is gives off the major proximal septal perforators. The longer one descends on the left ventricular side of the AIVS, and then reentering the distal AIVS.

Type II: The same as type I except that the long LAD descends on the right ventricular side, rather than the left, before reentering the AIVS. Types I and II can be better differentiated from one another angiographically in the left anterior oblique (LAO) view than in the right anterior oblique view (RAO).

Type III: The same as Types I and II except that the long LAD travels intramyocardially in the ventricular septum. This vessel is most visible in 2 angiographic projections: RAO and lateral.

Type IV: High in the AIVS, a very short vessel is formed by the LAD proper and the short LAD. From this vessel, the major septal perforators, as well as the diagonal branches, originate. The long LAD is unusual in its origin, arising from the right coronary artery [6].

Accordingly in our case it is considered to be Type I Spindola's classification. The question here what is the optimal approach of intervention if there is a chronic total occlusion CTO lesion in the long LAD after bifurcation of proper LAD? And is there a role of retrograde approach especially through septal perforators? It seems that the retrograde approach through septal collaterals in such situation will not succeed in reaching the distal CTO segment, as the pass way will lead to the short LAD branch, so ante grade approach is the mandatory way to recanalize that part of LAD otherwise surgical revascularization will be the choice.

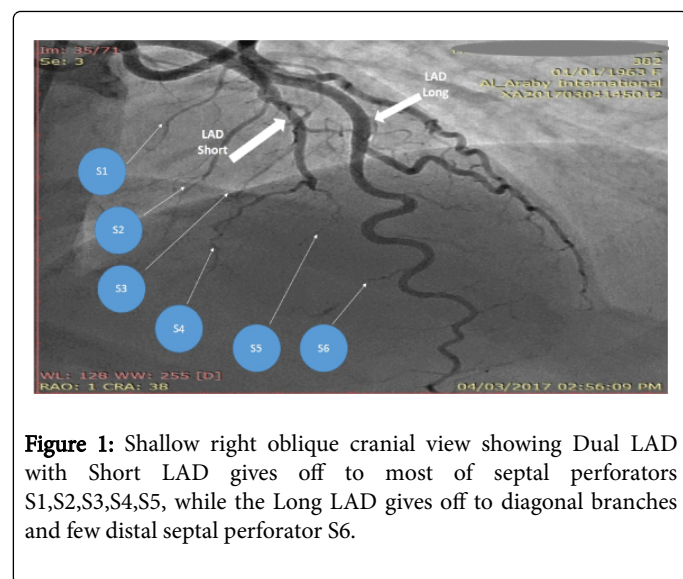


Figure 1: Shallow right oblique cranial view showing Dual LAD with Short LAD gives off to most of septal perforators S1,S2,S3,S4,S5, while the Long LAD gives off to diagonal branches and few distal septal perforator S6.

Conclusion

Dual LAD coronary anomaly is a rare case that could be confronted during regular coronary angiography, in case of chronic total occlusion

in Long LAD branch retrograde approach will be impossible through septal perforators, so paying attention to that anomaly could explain part of failure of retrograde approach is this kind of anomalies and it should pay attention to CTO operators to consider that anomaly in there CTO cases.

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