

Successful Primary Angioplasty of Anomalous Coronary Artery through Radial Access and Increased Guide Support: A Case Report

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Abstract

One of the rare abnormalities of coronary artery anatomy is the common origin of all three coronary arteries from the right sinus of Valsalva, which, may associated with myocardial ischemia. Percutaneous coronary intervention of such patients with anomalous coronary arteries is particularly challenging. In such patients femoral route is usually chosen for coronary angioplasty, various studies have proved that the radial access provides better engagement and robust support to the guide catheter. We report a rare case diagnosed with ST-segment elevated myocardial infarction. The patient underwent successful trans-radial primary angioplasty with a buddy wire, parked in the non-culprit artery.

INTRODUCTION

Coronary artery anomalies are congenital disorders diagnosed incidentally during coronary angiography (CAG). The anomalous anatomy of coronary arteries is associated with varied clinical manifestations. They are relatively uncommon with 1-2% of incidence during CAG, poses unique challenges during coronary angioplasty and consequently worst clinical outcomes. Additionally and the traditional guiding catheters prevent co-axial engagement and successful delivery of the hardware to the target lesion. Even though usually the femoral route is used for coronary angioplasty in such patient, various study has proved that radial route is relatively safer. Moreover in cases when femoral approach has failed, radial access can be used as an alternative for coronary intervention [1-3]. The percutaneous coronary intervention (PCI) of such patients is particularly challenging as they are unstable and need the earliest revascularization. We are presenting a rare case of such a patient who presented with ST-segment elevation myocardial infarction (STEMI) and underwent successful trans-radial primary angioplasty.

CASE REPORT

A 72-year-old male patient was presented at our casualty

department with a complaint of chest pain for 7 hours. At presentation, his blood pressure was 110/70 mm Hg, and heart rate was 64 bpm. The patient was diagnosed with STEMI in view of ST-elevation at lead I, and aVL, and, ST depression at lead II, III, aVF, V3 to V6. Echocardiogram was suggestive of hypokinesia of anterolateral wall with moderate LV systolic dysfunction (Fig 1)

The patient was injected with a loading dose of antiplatelets (aspirin and clopidogrel) and was shifted to a cardiac catheterization lab. The diagnostic SF Tiger catheter was used for angiography through right radial access, although, coronary ostia was not visualized in the left anterior aortic sinus. Instead, all the three coronary arteries were found originating from a common trunk of a right anterior aortic sinus (Fig 2). Angiography showed total thrombotic occlusion of the proximal circumflex artery (Fig 2). The diagnostic catheter was exchanged with JR 3.0 guiding catheter, however, coaxial engagement of the circumflex artery could not be achieved. The JR 3.0 catheter was again exchanged with a 6F multipurpose catheter and run through the coronary guidewire parked in the RCA as a buddy wire (Fig 3).

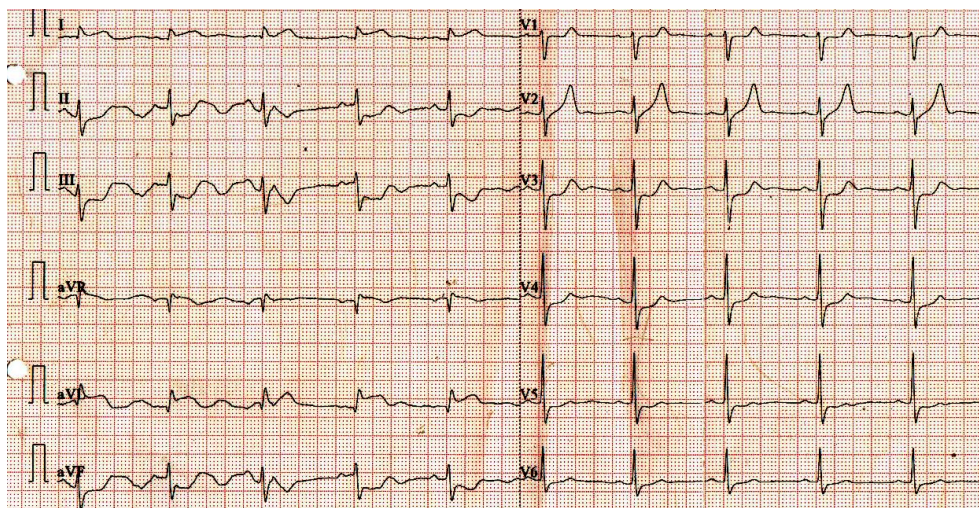


Figure 1. Electrocardiogram at presentation

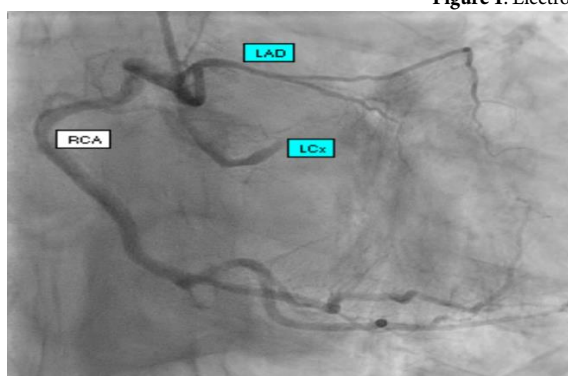


Figure 2. Pre-procedure angiogram showing common origin of all the three coronary arteries and proximal thrombotic occlusion at the circumflex artery. RCA: Right coronary artery; LCx: Left circumflex artery; LAD: Left anterior descending artery.

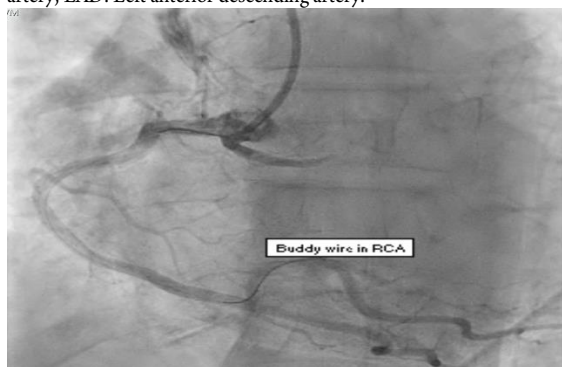


Figure 3. Buddy wire parked in right coronary artery for guide support. RCA: Right coronary artery

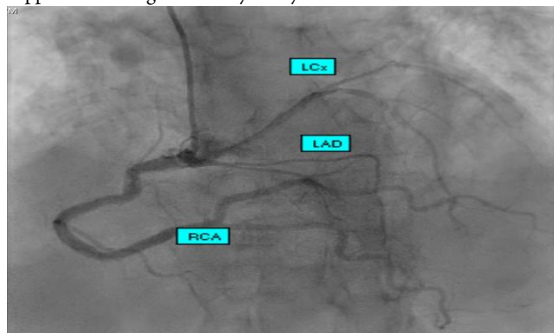


Figure 4. Post-procedure angiogram showing all the three coronary arteries originating from the right aortic sinus. RCA: Right coronary artery; LCx: Left circumflex artery; LAD: Left anterior descending artery.

The buddy wire yielded extra stability to the guiding catheter, and under this support, the circumflex artery was wired with another run through coronary guidewire. Antegrade flow was established after the first run of thrombus aspiration. Lesion was predilated with a 2x10 mm compliant balloon and stented with a 2.75x12 mm drug eluting stent. TIMI 3 flow was achieved and complete ST resolution was noted 90-minutes post-procedure (Fig 4).

DISCUSSION

The common origin of all the three coronary arteries is a rare coronary anomaly which can be associated with MI depending upon the course of the coronary artery [4-6]. Consequently, the PCI of these aberrant vessels is technically challenging, though, previous reports proved its feasibility. The difficulties that encountered during PCI of such vessels include improper visualization of anomalous arteries; inability to obtain a co-axial engagement of catheter during angioplasty; matching curve of the guidewire that follows the course of the aberrant vessels, which, also pose difficulty in the advancement of the balloon or the stent delivery system; and the inadequate experience of the surgeon regarding the anatomies of the anomalous arteries [7, 8].

The provision of supplementary support to the guide catheter is another significant obstacle in the PCI of anomalous arteries. As the coaxial alignment of the guide catheter with an unfavorable angle of the origin of the anomalous arteries may require additional support. In our case, the radial access successfully provided stability to the guide catheter. Additionally, various reports suggested that the right radial access provides good catheter support than the femoral access during PCI of anomalous arteries [1-3]. In our case, achieving the co-axial engagement by a workhorse guiding catheter was difficult. Therefore, we emphasized on the buddy wire, parked in the non-culprit artery to support the guiding catheter during its active manipulation. In this case, the circumflex artery was originated very proximally and, pointing downward during the initial

course. To match the route, a guiding catheter with the primary curve more obtuse than the Judkin's right was essential for the easy run through, hence, we chose a multipurpose catheter. Of note, because of the proximal origin of the circumflex, it was difficult to visualize after engaging the common trunk. Guiding catheter was pulled in the right sinus with the support of buddy wire and another wire introduced into the circumflex artery. We had also come across some difficulty while aspirating the thrombus into the catheter. The manoeuvre used for the installation of the guiding catheter was also followed during the delivery of the balloon and stent.

In conclusion, coronary intervention in unstable patients with anomalous origin of coronary arteries in the setting of acute myocardial infarction is inherently challenging. However, with the appropriate use of available hardware through the trans-radial approach the standard door to balloon time for PCI of such patients is achievable.

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None

Conflict of Interest

The Author(s) declare(s) that there is no conflict of interest.

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