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Cover Page Footnote

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Ultra Long Stent in an Aberrant Right Coronary Artery

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Abstract

The prevalence of anomalous origin of right coronary artery from the left sinus is about 0.92%. A percutaneous coronary intervention (PCI) in such a vessel is challenging especially when maneuvering long stents. We report a case of 75-year old female patient with recent acute coronary syndrome. The angiogram showed significant lesions in the left anterior descending coronary artery and the left circumflex coronary artery with an aberrant RCA originating from the left sinus close to the origin of LMCA with multiple tight lesions. The aberrant RCA was stented with a 50 mm long stent. To the best of our knowledge, the placement of such a long stent in an aberrant coronary artery has hitherto never been reported in the literature.

Keywords: Aberrant RCA, Inferior wall MI, Long stent

1. Introduction

A percutaneous coronary intervention in an anomalous vessel is a challenge right from catheter engagement to accurate stent deployment while minimizing the contrast volume and fluoroscopic time. The presence of hemodynamically significant lesions in other coronary vessels and sometimes the need for serial multiple stents in diffusely diseased vessels offsets the delicate balance between the final angiographic result and the procedure-related complications. Undoubtedly, both short-term and long-term prognosis depends on these two factors. The introduction of long stents has been a favorable alternative in this direction to reduce the number of stents, but at the same time poses a challenge to the operator in terms of trackability, especially in situations of inadequate guide support like an aberrant coronary artery.

2. Case Report

We report a case of 75-year old hypertensive female admitted with a history of recent unstable angina and an old inferior and posterior wall myocardial infarction (MI). She was hemodynamically stable. The ECG showed sinus rhythm with evidence of an old inferior wall MI. Echocardiography revealed hypokinesia of inferior and posterior segments with preserved wall thickness with good LV systolic function. She was subjected to coronary angiography via the right femoral artery which revealed proximal to mid diffuse 80–90% disease in the LAD with ostial 90% discrete disease in the first diagonal and proximal near total discrete disease in the second diagonal. The LCX was non-dominant with distal 90% discrete disease followed by total occlusion. The RCA was dominant with an aberrant origin from the left sinus. It was a 3.5 mm vessel with ostial 70% discrete disease followed by diffuse disease involving the entire RCA upto the crux with a maximum severity of 90% in the mid RCA and 80% before the crux. The SYNTAX score was calculated to be 41.5. After consulting the heart team, the potential

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benefits and need for CABG as the first option was discussed with the patient and relatives. The patient was not willing for CABG and opted for PCI. A decision to proceed with PCI was made in the heart team. The patient was loaded with aspirin 300 mg, ticagrelor 180 mg and atorvastatin 80 mg. The LAD and LCX were revascularized according to conventional angioplasty protocols. Engaging the aberrant RCA was difficult. Initial attempts with 7F Extra Back Up 3.0 (EBU, Medtronic, Inc., Minneapolis, MN, USA), 6F Tiger Heartrail guide catheter (Terumo Europe N.V., Leuven, Belgium), 7F Judkins Left 3.0 Launcher (Medtronic, Medtronic Parkway Minneapolis, MN, USA) failed. We could finally engage with a 7F Judkins Left 3.5 Launcher. The RCA was wired with Fielder FC (Asahi INTECC, Tustin, CA, USA) with Fine cross microcatheter (Terumo Medical Corporation, Somerset, NJ, USA) support. The Fielder FC was exchanged with a Grandslam (Asahi INTECC, Tustin, CA, USA) wire. The lesions were predilated with a 2.0 × 20 mm Sapphire II (OrbusNeich, Hong Kong) @ 10 atm. Further predilatation was done in mid RCA with a 2.5 × 12 NC Trek (Abbott Vascular, Santa Clara, California), dilated at 24 atm and in the distal RCA with a 2.0 × 15 mm Sapphire II at 16 atm respectively. The mid to distal RCA was stented with 3.0 – 2.5 × 50 mm Biomime Morph (Merilife Sciences, Gujarat, India) @ 14 atm to 3.20 mm (proximal size) and 2.70 mm (distal size). Overlapping with the proximal edge of the already deployed stent, the proximal RCA was stented with a 3.0 × 33 mm Partner (Lepu Medical Technology, Beijing, China) @ 14 atm to 3.18 mm. The overlapping segments and the proximal stent were post dilated with a 3.0 × 8 mm NC Trek @ 20 atm. Further, the RCA ostium was stented with a 3.5 × 8 mm Genx Sync (MIV Therapeutics India Ltd, Surat India) @ 18 atm to 3.86 mm. TIMI III flow was noted in all revascularized vessels. The total procedure time was 103 minutes with a contrast volume of 330 ml (see Figs. 1–4).

3. Discussion

The prevalence of an anomalous origin of the RCA from the left sinus is about 0.92%.^[1] The challenges in engaging an aberrant RCA include finding the ostium without significant usage of contrast, the coaxial placement of an appropriate guide, adequate guide support, wiring the tortuous vessel deep into its distal segment, trackability of balloon and stent. In this case, the vessel was diffusely diseased with a need for three stents, the distal stent being a 50 mm long tapering stent. Attempting to track such a long stent in an aberrant coronary vessel should only be done after the achievement of good guide stability and generous

Abbreviations

RCA	Right coronary artery
LCX	Left circumflex artery
LAD	Left anterior descending artery
LMCA	Left main coronary artery
PCI	Percutaneous coronary intervention
ECG	Electrocardiogram
LV	Left ventricle
Atm	Atmosphere
ml	milliliter
TLR	Target lesion revascularization
MACE	Major adverse cardiovascular events
TIMI	Thrombolysis in myocardial infarction

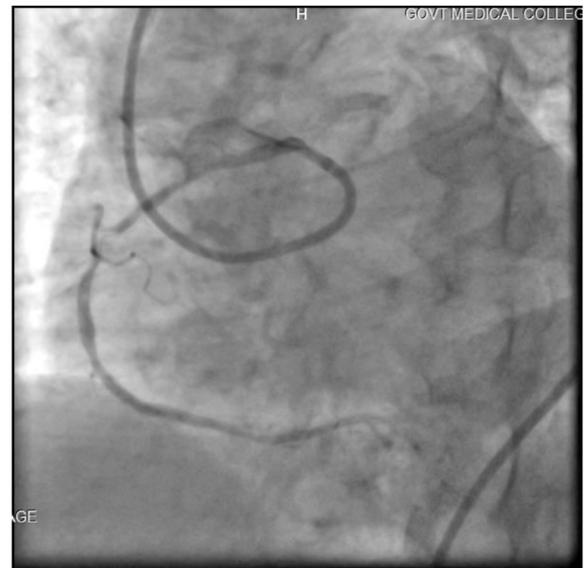


Fig. 1. Aberrant RCA hooked with JL 3.5 Launcher.

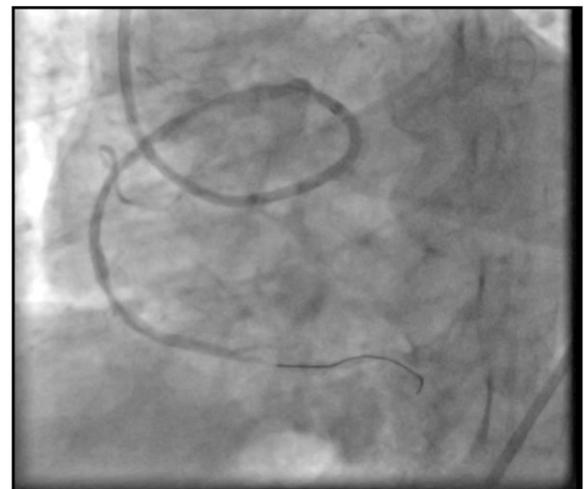


Fig. 2. RCA wired with Fielder FC coronary wire.

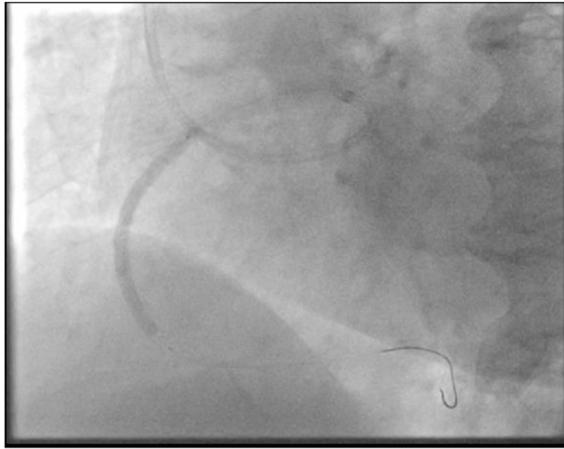


Fig. 3. Mid RCA stented with 3.0 - 2.5 × 50 mm long Biomime Morph Stent.



Fig. 4. TIMI III flow achieved as the final result.

predilatation. Multiple trials with several guiding catheters before finding the ideal one appropriate for the coronary anatomy is usual when dealing with anomalous vessels. The various catheters usually used in such situations were the Amplatz, Tiger Heartrail, EBU guide and JL catheters.[2] The use of a left bypass guiding catheter has been reported by D Sun et al.[3] Desabandhu V et al. reports a case of engaging the anomalous RCA with a diagnostic JL 3.5 catheter and passing a 300 cm Fielder FC wire into the vessel, over which the catheter was exchanged with a 7F 3.5 JL guide.[4] Finding it difficult to engage, a 2 mm × 15 mm balloon was passed distally and dilated to 8 atm. This anchoring

force of the dilated balloon was utilized to lead the guide catheter and hence successfully engage the RCA. A case reported by LF Hong et al. describes the difficulty of tracking the stent even after adequate predilatation due to lack of guide support. He circumvented this difficulty by anchoring two guiding wires of supreme supportiveness into the LCA aimed to augment the supportiveness of the guide catheter.[5] These cases emphasize the need for the operator to be familiar with the various strategies involved in the PCI of an anomalous coronary artery and the willingness to experiment and innovate until the desired result is achieved.

Author Contribution

Conception and design of Study, Literature review, Acquisition of data, Analysis and interpretation of data, Analysis and interpretation of data, Research investigation and analysis, Research investigation and analysis, Data collection, Drafting of manuscript, Revising and editing the manuscript critically for important intellectual contents, Data preparation and presentation, Supervision of the research, Research coordination and management, Funding for the research: Vinayakumar Desabandhu, Jomy Vadasseril Jose.

Conflict of Interest

We have no conflict of interest associated with this publication, and there has been no financial support for this work that could have influenced the outcome of this study.

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