PERCUTANEOUS CORONARY INTERVENTION TO RADIAL GRAFT IN A PATIENT WHO HAD CORONARY BYPASS SURGERY WITH Y ANASTOMOSIS

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ABSTRACT

Background: Percutaneous coronary intervention (PCI) of radial artery grafts (RAGs) anastomosed to the left internal mammary artery (LIMA) is rare, particularly in complex Y-graft configurations

Case Presentation: A 74-year-old diabetic woman with prior CABG (LIMA to LAD, RAG to OM and RCA via Y-anastomosis) presented with angina and ECG changes. Angiography showed severe stenosis in the RAG. PCI through the LIMA was performed with drug-eluting stent placement, achieving good results.

Conclusion: This rare case highlights the technical feasibility and clinical success of PCI in a RAG originating from a distal LIMA Y-anastomosis. Multidisciplinary evaluation is essential in managing such complex anatomy.

Keywords: percutaneous coronary intervention, left internal mammary artery with Y anastomosis, coronary artery bypass graft, radial artery graft

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INTRODUCTION

Coronary artery bypass graft (CABG) is the treatment of choice of severe Left Main Coronary artery stenosis or three vessel coronary artery disease using combined arterial and venous grafts (1,2). Saphenous Veins grafts are associated with a higher mortality rate compared to arterial grafts in general, thus arterial conduits including (right internal thoracic artery, right gastroepiploic artery, right inferior epigastric artery, and radial artery) are being used more frequently (3).

Radial artery graft (RAG) was first performed in the 1970s and stopped because of early reports of graft failure (4,5); however, excellent results were reported in the early 1990s about graft patency using new technical and pharmacological methods. Since then, many surgeries have been performed using this graft technique (6). Moreover, free RAG with proximal anastomosis from the aorta is preferred over RAG with proximal anastomosis in the left internal mammary artery (LIMA) (7).

CASE PRESENTATION

A 74-year-old female patient, who had type 2 diabetes for more than 5 years and had undergone CABG, with LIMA to the left anterior descending (LAD) artery and sequential RAG to both the right coronary artery (RCA) and obtuse marginal (OM) artery in 2015, presented to our clinic with angina equivalent symptoms and new ECG changes of right bundle branch block, with Q waves on inferior leads. Her echocardiogram

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was normal. She was given an angiogram appointment based on her symptoms and ECG changes.

In the coronary catheterization laboratory, her angiogram showed severe distal left main disease, occluded LAD, severe ostial disease of OM2 filling from RAG, and total occlusion of mid RCA (Figures 1 and 2). Her LIMA to LAD was patent, and RAG, which has proximal anastomosis from distal LIMA just before LAD anastomosis, was patent, with severe mid focal disease and supplying both OM2 and RCA (Figure 3).

After the intracoronary injection of nitroglycerin, a decision was made after discussion with colleagues to do RAG through LIMA, and a 100cm 6F LIMA(Mach1 , Boston Scientific) guide catheter was placed on the LIMA ostium, a 0.014in(ChoICE , Boston Scientific) extra support guidewire was advanced carefully through LIMA and placed in the RAG distal to the lesion , followed by a 3 mm × 15 mm PROMUS Element(Boston Scientific) drug-eluting stent, which was deployed successfully with good results (Figures 4 and 5).

A follow-up angiogram done 7 months later showed a nicely patent RAG stent (Figure 6).

DISCUSSION

Graft failure is common in patients who had CABG, with treatment options including medical therapy, thrombectomy, redo CABG, and balloon angioplasty with stenting (8). The treatment plan should be carefully selected according to symptoms presented, left ventricular function, risk factors, and benefits and after discussion with a multidisciplinary team.

Radial graft failure can be divided into complete occlusion of the vessel, sling-like appearance, and focal stenosis (9). Early graft failure is usually caused by acute thrombosis (technical problems, conduit related factors and hypercoagulable state). In the first months after surgery, neointimal hyperplasia at the anastomotic site that extend gradually to be generalized is the usual cause of graft failure, whereas atherosclerotic degeneration is the main cause of graft failure after 12 months. (10).

More patients with a history of CABG are being treated with percutaneous coronary intervention (PCI) (11,12) mainly due to higher mortality rates associated with redo CABG compared to first time CABG (13), although many reports have suggested that redo-CABG has some advantages over PCI, mainly due to the reduced frequency of later revascularization (14).

Graft PCI is more challenging as it can be complicated by periprocedural myocardial infarction and higher restenosis rate than native vessel PCI (15), especially when the graft supplies a large area of the myocardium.

RAG PCI through LIMA was described in a case report by Beloscar and colleagues, where the patient started to get angina 6 months after stenting, another angiograph was performed showing in-stent restenosis which was treated by angioplasty (16). Another study of RAG PCI over 18 patients was done by Goube and colleagues, where they performed balloon angioplasty in 9 patients and stenting in 9 patients, showed 2 RAG restenosis in the balloon angioplasty group and 1 in the stent group (17).

Currently, RAG PCI success rate is equivalent to LIMA PCI, with a higher

restenosis rate in RAG PCI patients, mostly because patients who underwent CABG using RAG are usually diabetics (18).

This case report describes a PCI of RAG with proximal anastomosis in distal LIMA, where the graft supplies both the OM and posterior descending branch of the RCA.

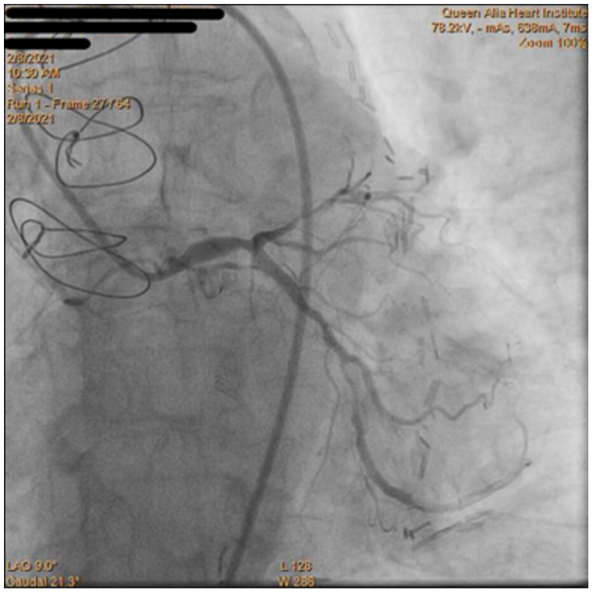

Figure 1: Left anterior oblique caudal view of the left system showing severely diseased left main coronary artery, total occlusion of the left anterior descending artery, and severe ostial disease of obtuse marginal 2.

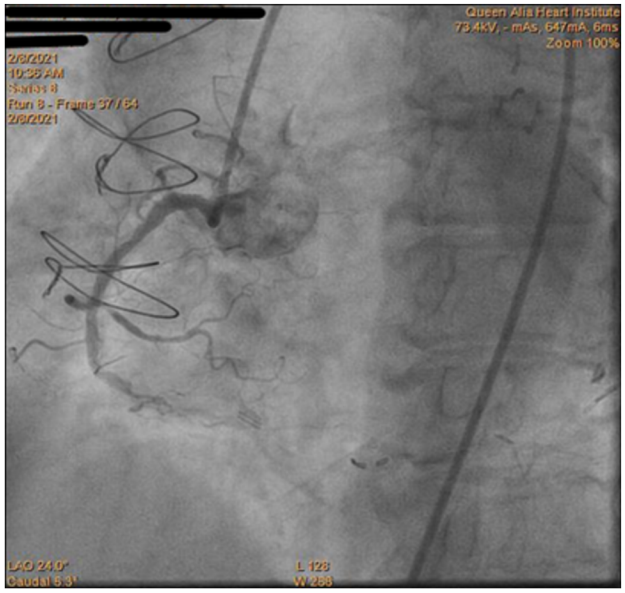

Figure 2: Left anterior oblique caudal view of the right coronary artery showing an occluded Right Coronary Artery.

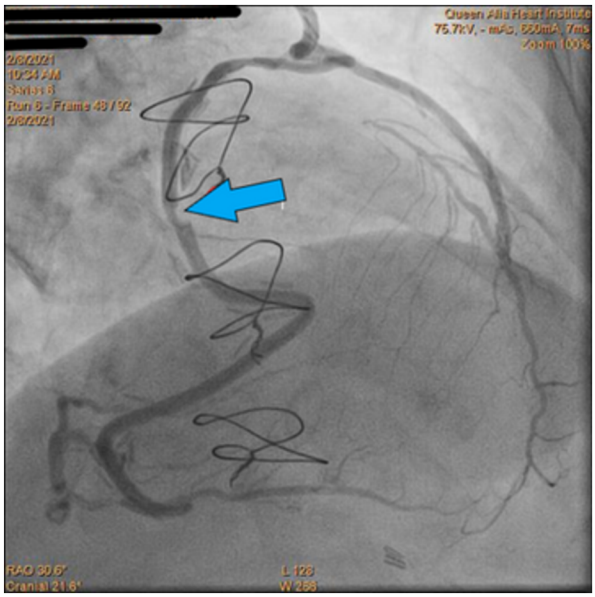

Figure 3: Right anterior oblique cranial view shows a patent left internal mammary artery to left anterior descending with Y anastomosis to the right coronary artery and obtuse marginal 2. The arrow indicates severe focal stenosis in the radial artery graft.

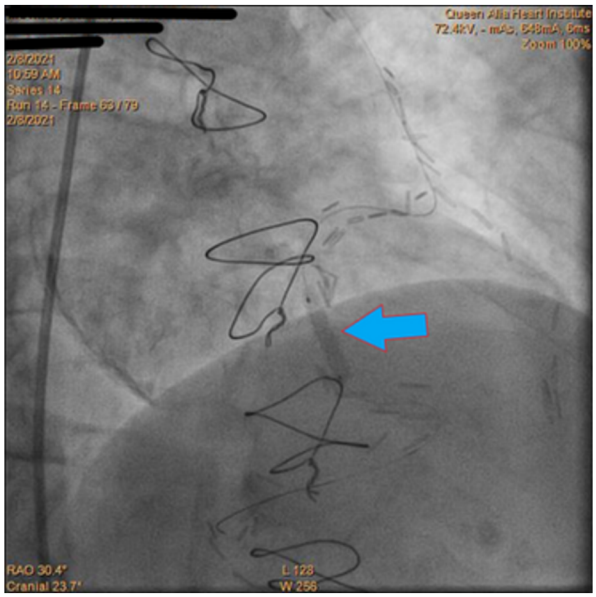

Figure 4: Right anterior oblique cranial view showing stent deployment in the radial artery graft. The arrow indicates the stent while being inflated.

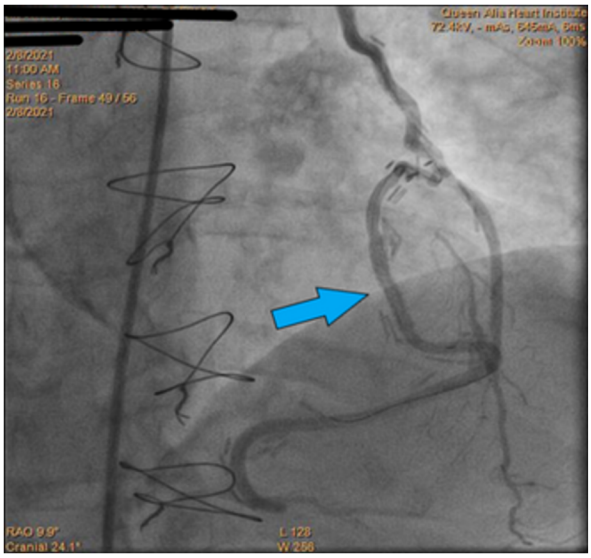

Figure 5: Right anterior oblique cranial view after stent deployment. Blue arrow indicates stent position.

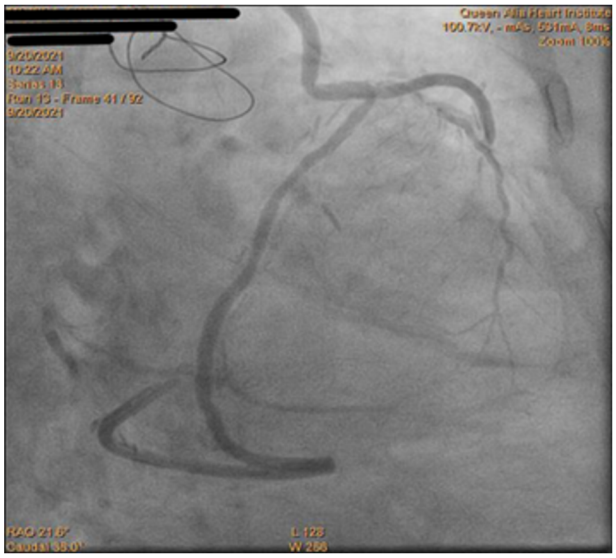

Figure 6: Right anterior oblique cranial view 7 months later showing a patent stent in the radial artery graft.

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