Multiple Giant Coronary Arterial Aneurysms following Sirolimus Drug Eluting Stents Implantation

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Abstract

Coronary artery aneurysm after coronary interventions are rare but variable (0.2%-1.7%) clinicopathological entity depending on whether a incidental or a routine 6 monthly angiographic follow up finding and is seen more common with drug eluting stents (DES) rather than bare metal stents (BMS). It is of three types and depending on the type and patient clinical response further strategy (conservative, covered stents or coronary artery bypass surgery) is decided. We report a patient with large type 2 coronary artery aneurysms post percutaneous coronary intervention (PCI) to the right coronary artery (RCA) and the Left anterior descending (LAD) coronary artery and presenting four months later.

Case

A 50 year old male who underwent coronary angioplasty with stenting to LAD and RCA with cypher select 3.0 mm x 24mm and 3.0 mm x 18 mm four months back for unstable angina presented again to the hospital with chief complaints of exertional angina Canadian class 3 grade. His ECG showed global ST-T changes suggestive of ischaemia and being a high risk case (ACC/AHA labels patient who had coronary artery disease and underwent PCI or CABG as high risk patients and the threshold for coronary angiogram in those are lower vis a vis a presenting without such history). He was planned for a check angiogram. His cardiac enzymes were normal which was expected as historically he was having stable angina pattern only though the grade was obviously higher. His 2D echo/colour Doppler showed good LV function with EF of 60%, no RWMA, valves and pericardium were normal, so was the RV and pulmonary arteries. Coronary angiogram unexpectedly showed bilateral coronary arterial giant aneurysms with persistant restenosis as the cause of his angina. The patient was sent for referred for CABG surgery (Figures 1 and 2).

Discussion

Coronary artery aneurysm by definition is luminal diameter 50% greater than the adjacent normal segment and large aneurysm is the one which is 100% greater than the adjacent normal reference segment. Kachru et. al.¹ have reported an incidence of 0.2% without routine angiographic follow up where as Rha et.al² have reported an incidence of 1.7% per patient at 6 month routine angiographic follow up. As far as conventional coronary angiogram is concerned it is good for accurate diagnosis. Intravascular ultrasound (IVUS)is needed for determining the exact mechanism for the aneurysm.³ Aoki et. al.³ have classified stent aneurysms into three types based on plausible mode of origin and time of onset.

Type 1

Early presentation within 4 weeks and is due to arterial injury related to the procedure (oversized balloons, high pressure inflations, atherectomies and laser angioplasty). Typically associated with pericarditis. Pseudoaneurysms are also clubbed in type 1 variety of stent aneurysm and when compared for
true aneurysms they are more predisposed for rupture. Large aneurysms or any associated cardiac symptoms if present necessitates some form of active intervention either percutaneous (covered stents, coils) or surgical (ligation, resection along with bypass grafting).

**Type 2**

They have a relatively late (3-6 months) and variable presentation; asymptomatic or may have Angina. It is basically a chronic arterial response to a metal stent, polymer (it is meant for slow and sustained release of antiproliferative drug over a span of few weeks to months) and/or drug and it is the reason why aneurysm is more common with DES.

Some sort of local hypersensitivity reaction also accounts for relatively high association of aneurysm with paclitaxel eluting stents. Some of the type 2 stent aneurysm might regress also but most would need some form on active intervention either surgical or percutaneous based.

Our patient had presented 4 months after coronary angioplasty with exertional chest pain (Angina) and his angiogram revealed large bilateral type 2 stent aneurysms and hence was sent for surgery. He fared well after LIMA-RIMA Y graft to LAD and PDA along with the ligation of the aneurysms. Covered stent was not used as it has high incidence of restenosis and side branch occlusion/closure rate.

**Type 3**

Mycotic or infectious aneurysm. Early presentation with systemic manifestations and fever. It always needs surgical correction and that too on urgent basis.

The various factors implicated for post PCI stent aneurysms are namely high pressure post dilatation of stent causing covert damage to media of the arterial wall, residual flap, eluting drug (Sirolimus in case of Cypher select stent), polymer over which drug is coated, multiple layers of stent (long overlapped segment), infection, etc.

Other supportive therapies for stent aneurysm include long term dual antiplatelet therapy or even triple antiplatelet therapy (PGE inhibitors in addition) or some form of anticoagulation though the evidence of anticoagulation is meagre so as to prevent restenosis, thrombosis and even distal thromboembolism.

Somebody has rightly said prevention is better than cure and hence to prevent infected aneurysms proper antisepsis should be maintained at each level throughout the procedure along with periodic sterilization of operating rooms.

Appropriate selections of catheterisation laboratory. Hardwares (guidewires, optimum sized balloons) is important to avoid these post PCI trauma (to the arterial media) related aneurysms.

**References**