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Case report

Left main coronary artery bifurcation angioplasty and stenting after aortic valve replacement: a case report

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KEYWORDS

Aortic valve replacement (AVR)
Left main coronary artery (LMCA) disease
LMCA stenting
Open heart surgery
Percutaneous coronary intervention (PCI)

ABSTRACT

A 43-year-old young lady had closed mitral valvotomy (CMV) in 1994 and aortic valve replacement (AVR) in June 2007. Shortly thereafter, she presented with unstable angina in October 2007 with on-going pain and haemodynamic instability. Coronary angiogram showed tight left main bifurcation stenosis in a left dominant system. Having had open heart surgery (AVR) recently, and being on oral anticoagulation, with on-going ischaemia and unstable haemodynamics, percutaneous coronary intervention (PCI) was considered the most suitable option. She underwent successful PCI with two drug-eluting stents (T-stenting) to left main bifurcation through transradial approach and intra-aortic balloon support. Clinically she remained symptom free and coronary angiogram after 5 months and 15 months of follow-up showed patent stents. This case demonstrates the acute effectiveness of PCI for the treatment of critical left main disease following open heart surgery in patients who are not appropriate surgical candidates.

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Introduction

Left main coronary artery (LMCA) involvement has been reported after cardiac coronary catheterisation[1,2] or after cannulation for cardioplegia during open heart surgery. It has also been reported after aortic valve replacement (AVR)[3–7] which involves the ostium. In such a condition repeat surgical intervention is of a very high-risk. Percutaneous coronary intervention (PCI) appears most suitable, albeit keeping in mind that standby surgical back-up may not be feasible. We report an unusual case of tight left main bifurcation stenosis in a left dominant system, shortly following AVR that was treated successfully with PCI and stenting.

Case report

A 43-year-old young lady presented to hospital triage with chest discomfort and perspiration. She had closed mitral valvotomy (CMV) in 1994 and AVR with tilting disc in June 2007 in another place. She had presented to the same facility with unstable angina (Braunwald class III B2) in October 2007 and was managed with nitrates, beta-blockers, clopidogrel, aspirin, atorvastatin, and oral anticoagulants. Her coronary angiogram showed tight left main bifurcation stenosis in left dominant system. She was advised early revascularisation for which she was transferred to this facility on inotropic support.

Examination revealed a small built short stature lady, with on-going chest discomfort and perspiration. She had moist skin with pulse rate of 100/min and blood pressure of 90/60 mmHg on inotropic support. She had soft heart sounds and a prosthetic sound with short ejection systolic murmur over aortic area. Auscultation of chest revealed normal respiratory sounds and other systemic examination were unremarkable. Electrocardiogram (ECG) showed left ventricular hypertrophy (LVH) with ST depression in anterolateral leads. Chest radiograph showed normal cardiac silhouette with sternal wires and had no signs of pulmonary venous congestion. Echo revealed hypertrophied left ventricle and a prosthetic aortic valve normally functioning (peak-to-peak gradient of 25 mmHg, no regurgitation) and mild mitral stenosis (mitral valve area of

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2.3 cm^2) but no regurgitation. There were no regional wall motion abnormalities. The prothrombin time international normalised ratio (INR) was 2.7 and troponins (qualitative bedside assay) were negative on admission.

Due to continuing ischaemic symptoms and haemodynamic instability, physician, interventionist, cardiac surgeon, discussed with patient and her family members the possible modes of management and interventions. The option of repeat surgical intervention at such a short interval carried unacceptably high peri-operative mortality. Ultimately the decision was made to proceed with PCI.

In catheterisation laboratory, intra-aortic balloon pump (IABP), catheter was inserted through right femoral access, using 8F catheter (Data scope, Fairfield, NJ, USA), in view of haemodynamic instability and on-going ischaemia. Heparin (unfractionated) bolus dose and Abxicimab (bolus plus infusion) were administered according to body weight. Left femoral access was kept free for percutaneous cardio-pulmonary support if need arises. Under conscious sedation, after radial access, 6F sheath (Terumo Corp, Tokyo, Japan) was inserted. The 6F sheath was exchanged for 7Fr sheath (Cordis Corp., Miami, Florida, USA) to facilitate use of 7Fr Guide and hence, make easier simultaneous use of two balloons or stents. Left main coronary artery was then engaged with a 7Fr Launcher Judkins left catheter (Medtronic Inc. Minneapolis, MN, USA). Check angiogram showed tight LMCA bifurcation lesion (Figures 1A and B). The LMCA lesion was crossed with 0.014, 190 cm Allstar wire (Abbott Vascular, Santa Clara, CA, USA) into left anterior descending artery (LAD) and another 0.014, 190 cm Allstar wire into left circumflex artery (LCX). The LMCA-LAD lesion was then dilated with 2.5 × 13 Fortis balloon (Kaneka Corporation, Osaka, Japan) at 12 atmosphere (atm) and stented with 3.5 × 18 Cypher select plus (Cordis Corp., Miami, Florida, USA) at 14 atm. Check angiogram showed pinching of LCX ostia. The wires in LAD and the jailed wire in LCX were exchanged. The LCX ostium was then dilated with 2.5 × 13 Fortis balloon. The Cypher select stent in LMCA-LAD was then dilated with 4 × 8 non-compliant Fortis balloon at 18–26 atm. After kissing balloon dilatation with 4 × 8 Fortis non-compliant balloon and 3 × 15 semi-compliant Xtram-Way balloon (Blue Medical Helmond, Netherlands), LCX ostia showed residual stenosis. T stenting was done to LCX branch with 3.5 × 15 Xience V (Abbott Vascular, Santa Clara, CA, USA) at 12 atm. Final kissing balloon dilatation was then done with 3.5 × 12 Fortis and 3.5 × 15 NC Mercury (Abbott Vascular Instruments, Deutschland GmbH, Germany) non-compliant balloons in LMCA-LAD and LMCA-LCX at 20 atm. Final angiogram showed no residual stenosis (Figures 2A and B).

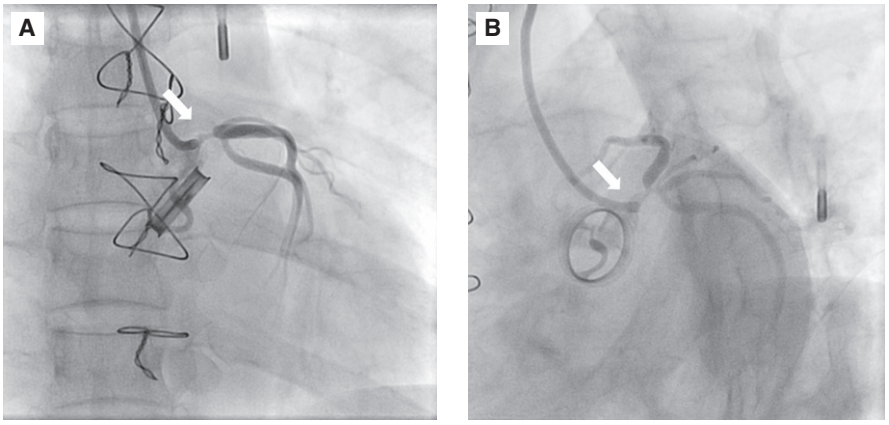

Figure 1 (A) Anterior–posterior view and (B) left anterior oblique caudal—spider view: distal left main bifurcation tight stenosis before angioplasty (tight blocks shown by arrow).

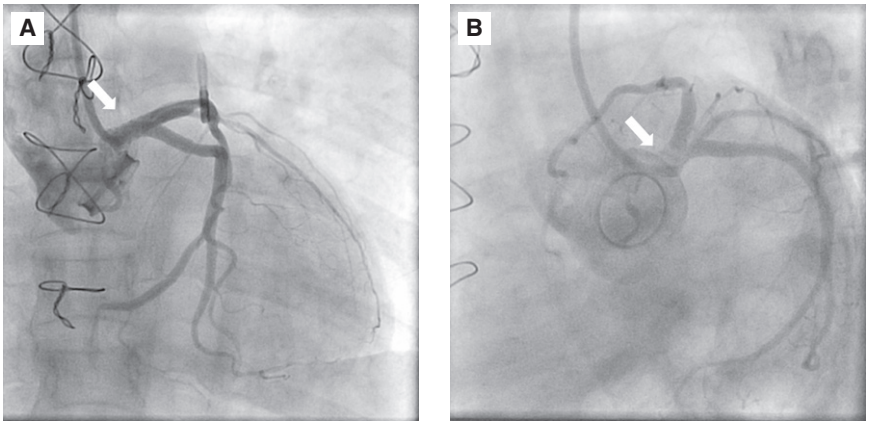

Figure 2 (A) Anterior–posterior view and (B) left anterior oblique caudal—spider view: left main after angioplasty and T stenting (shown by arrow for comparison).

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