Treatment of unprotected left main stem stenosis in an 81-year-old using a rapamycin-coated stent

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Introduction

We report a case of unprotected, ostial left main coronary artery disease successfully treated with a rapamycin-coated 'Cypher' stent in an 81-year-old woman who was declined for coronary artery bypass surgery because of significant co-morbidity.

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Case report

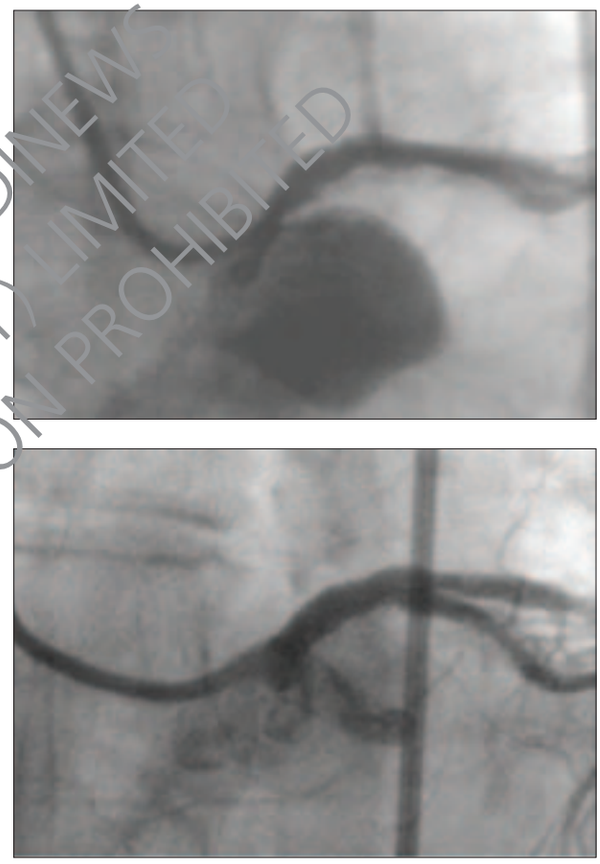
An 81-year-old woman was admitted under the care of the vascular surgery department for ileofemoral endarterectomy and peripheral bypass surgery to treat the critical ischaemia in her distal right leg. There was no history of cardiac illness. Shortly before surgery, she complained of chest pain. A 12-lead ECG showed new atrial fibrillation (ventricular rate 137 min^{-1}), widespread ST segment depression, and ST segment elevation in lead aVR, consistent with ischaemia due to left main coronary artery obstruction.[1] Creatine kinase was within normal limits but cardiac troponin-I was significantly elevated (1.32 ng/ml; normal < 0.03). Significant co-morbidity included an asymptomatic 99% left internal carotid artery stenosis and mild renal insufficiency (creatinine 130 µmol/L).

The patient was commenced on a beta blocker, low-molecular-weight heparin and clopidogrel, and was scheduled for urgent coronary angiography. Left heart catheterisation showed an 80% ostial left main coronary artery (LMCA) lesion (figure 1a), a 60–70% lesion in the proximal left anterior descending (LAD) artery, non-flow-limiting disease in the circumflex coronary artery, and an occluded dominant right coronary artery with good collateral filling from the left coronary artery. The proximal sections of all coronary arteries were heavily calcified but the distal vessels were free from significant disease and appeared suitable for bypass grafting. Left ventricular function was well preserved, with no regional wall motion abnormality.

The patient was referred for coronary bypass surgery but was declined on the grounds of prohibitive co-morbidity. Instead, a percutaneous management strategy was chosen to enable peripheral vascular surgery to be performed.

Using a short-tipped left Judkins 3.5 cm guide (Vistabritetip, Cordis Corp.) and an extra support 0.014 inch angioplasty

Figure 1. **a**: angiogram of the left main coronary artery (LMCA), demonstrating an 80% ostial lesion (AP projection)
b: final angiogram, demonstrating post-stent dilatation (AP projection)



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Key messages

- Stenting of LMCA lesions is a reasonable alternative to bypass surgery in patients considered unfit for CABG
- The restenosis rate in bare-metal stented LMCAs appears to be high and may justify the use of drug-eluting stents

guidewire (ACS, Guidant), the left main coronary artery was engaged and the angioplasty wire passed to the distal LAD. The ostium of the LMCA was pre-dilated with a 3.25 x 12 mm non-compliant balloon (Quantum, Boston Scientific) until full expansion was obtained (14 atm). The ostium of the LMCA was subsequently stented with a rapamycin-coated 3 x 8 mm 'Cypher' stent (Cordis Corp.) at high pressure (20 atm). Post-stent-deployment dilatation was then performed with a 3.5 x 10 mm non-compliant balloon to 23 atm (Extensor; Medtronic Inc.). The final angiographic result was good (figure 1b), with TIMI 3 flow in the LAD and circumflex arteries. Abciximab was given immediately prior to intervention and the patient was pre-treated with clopidogrel for several days. The procedure was well tolerated and there were no intraprocedural complications. ECG after the procedure showed resolution of her ST segment and T wave changes.

Discussion

Untreated, severe LMCA disease carries a poor prognosis compared with revascularisation by coronary bypass surgery.[2] In the case described, the risks of bypass surgery were felt to be prohibitive, prompting a percutaneous revascularisation approach. No randomised trials of LMCA stenting versus coronary bypass surgery have been conducted, but a number of published registries have confirmed that percutaneous revascularisation can be performed with high procedural success and low MACE rates when bypass surgery is deemed unsafe or unfeasible.[3-5] Although it is a large diameter vessel (typically > 3 mm), the angiographic restenosis rate in a recently published series of LMCA lesions treated with standard bare-metal stents was surprisingly high, at 31.4%.[4]

The landmark RAVEL study published last year showed that use of a rapamycin drug-eluting stent abolished restenosis compared with standard bare-metal stents in non-LMCA interventions,[6] an effect which was independent of vessel diameter.[7] Importantly, there were no cases of stent thrombosis in the drug-coated arm, indicating that prevention of restenosis was not at the expense of stent thrombosis.

Based on the high rates of restenosis of LMCA lesions treated with bare-metal stents, a decision was made to treat the ostium of the LMCA with a rapamycin drug-eluting stent. If the results of using rapamycin-coated stents from recent trials such as SIRIUS[8] and RAVEL can be extended to LMCA interventions, then percutaneous intervention of LMCA disease with drug-eluting stents may well prove superior to bypass surgery for certain patterns of LMCA disease. Trials of coated stent implantation versus conventional bypass surgery are awaited with much anticipation.

Conflict of interest

None declared.

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