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Restenosis in simultaneous kissing stents to treat unprotected left main stem coronary artery bifurcation disease: incidence and management

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Background: The simultaneous kissing stents (SKS) technique is useful to treat selected patients with true bifurcation disease of the left main stem (LMS). We report on the incidence, pattern and treatment of restenosis in the context of this stenting technique.

Purpose: To report the incidence and management of restenosis in an unselected cohort of patients who had undergone the SKS technique for revascularization of unprotected LMS coronary artery disease with drug eluting stents (DES).

Method: We treated 189 patients with unprotected bifurcation LMS disease with SKS using DES between 2004 and 2016. We describe the incidence of clinically driven repeat revascularization, the pattern of restenosis, and the practical approach to repeat PCI and its outcomes.

Results: In the study period 531 LMS PCIs were performed, of which, 197 were SKS: 5.5% elective, 29.2% urgent, and 65.3% emergency procedures. 17% developed symptomatic restenosis: 8 in years 0–1, 2 in years 1–2, and 7 in years 3–8. For all 17 patients with recurrence: mean age was 64.8 years, 10 were male and two were diabetic. The median (IQR) estimate of inpatient mortality by the logistic New York PCI risk score was 0.8 (0.2–9.4) and, by logistic EuroSCORE-1, 4.5 (0.9–23.6). The mean (SD) SYNTAX score was 29.6 (13.6) and seven had a SYNTAX score >32. Eight patients were unsuitable for CABG. SKS used 1st generation DES in 13 and 2nd generation in four. Presentation was elective in eight patients and non-elective in nine. The recurrence rate at two years was 7.5% for 1st generation and 4.4% for 2nd generation (P=0.50). The site of restenosis was LMS-LAD “barrel” in 10/17, LMS-Cx “barrel” in 16/17, and both in 9/17. Repeat PCI was feasible in 16 cases, one was treated with CABG because of concomitant occlusive in-stent restenosis in the right coronary artery (RCA). It was possible to pass guidewires, balloons, IVUS catheters and stents through the original stents in all cases. In the early patients, simultaneous kissing balloons (SKB) were used, to avoid the placement of a second stent layer. SKS was increasingly employed. In total, repeat SKS was performed in six patients, SKB in five, a combination of stent and balloon (SKS/B) in three, and a single stent in two. After repeat PCI, at 1 year follow up, 1 of 15 patients had died and another developed symptomatic restenosis, which was initially treated with SKB and subsequently with repeat SKS. All others remained asymptomatic.

Conclusions: For treating unprotected LMS bifurcation disease, SKS results in an acceptable symptomatic recurrence rate. The SKS technique was used predominantly in urgent or emergency procedures. Its treatment with repeat SKS is feasible, safe and effective.

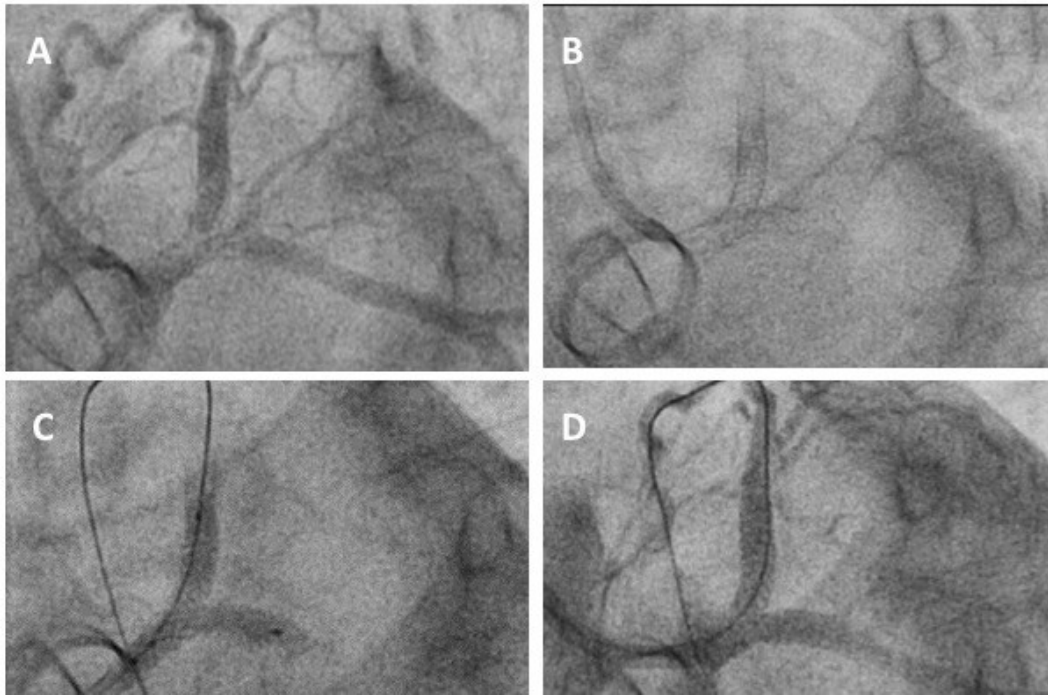


Figure 1. A case of LMS restenosis after SKS and its treatment with repeat SKS. Restenosis affected both limbs (A) despite well deployed DES (B). Repeat SKS was undertaken using 3.5x20 and 3.5x16mm DES (C). The final result was excellent (D).