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Randomized study to evaluate sirolimus-eluting stents implanted at coronary bifurcation lesions

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BACKGROUND: A sirolimus-eluting stent (Cypher, Cordis Corp) has been reported to markedly decrease restenosis in selected lesions; higher-risk lesions, including coronary bifurcations, have not been studied. **METHODS AND RESULTS:** This prospective study evaluated the safety and efficacy of sirolimus-eluting stents for treatment of coronary bifurcation lesions. Patients were randomly assigned to either stenting of both branches (group A) or stenting of the main branch with provisional stenting of the side branch (SB) (group B). Eighty-five patients (86 lesions) were enrolled. There was 1 case of unsuccessful delivery of any device at the bifurcation site. Given the high crossover, more lesions were treated with 2 stents (n=63) than with stent/balloon (n=22). Clinical follow-up at 6 months was completed in all patients and angiographic follow-up in 53 patients in group A (85.5%) and 21 in group B (95.4%). One patient died suddenly 4.5 months after the procedure. There were 3 cases of stent thrombosis (3.5%). The total restenosis rate at 6 months was 25.7%, and it was not significantly different between the double-stenting (28.0%) and the provisional SB-stenting (18.7%) groups. Fourteen of the restenosis cases occurred at the ostium of the SB and were focal. Target lesion revascularization was performed in 7 cases; target vessel failure occurred in 15 cases (17.6%). **CONCLUSIONS:** These results are an improvement compared with historical controls using bare metal stents. Restenosis at the SB remains a problem. At this time, no statement can be made regarding the most appropriate technique to use when treating bifurcations with the Cypher stent.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=14981005

Catheter Cardiovasc Interv (2005);64:169-72

Treatment of a coronary aneurysm involving bifurcation with the use of a custom-made polytetrafluoroethylene-covered bifurcation stent system

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We report a case with a large aneurysm of the proximal left anterior descending coronary artery involving the bifurcation with a diagonal branch. We used a custom-made bifurcation system with a polytetrafluoroethylene-covered stent for the main branch and a bare metal stent for the side branch with excellent clinical and angiographic result at 5-month follow-up. *Catheter Cardiovasc Interv* 2005;64:169-172. (c) 2005 Wiley-Liss, Inc.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=15678462

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Balloon crush: treatment of bifurcation lesions using the crush stenting technique as adapted for transradial approach of percutaneous coronary intervention

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University Health Network, University of Toronto, Toronto, Ontario M5G 2C4, Canada. The recent advent of drug-eluting stents has allowed the crush stenting technique to be adopted, thus simplifying the treatment of bifurcation coronary artery lesions. However, this can only be achieved in 7 Fr or greater guiding catheters, hence precluding most transradial percutaneous coronary interventions that are usually undertaken using 6 Fr or less guiding catheters. We assessed the feasibility of balloon stent crush as a stepwise procedure in achieving bifurcation crush stenting in 6 Fr transradial percutaneous coronary interventions. Since it is not possible to place two stents through a 6 Fr guiding catheter, we have adapted the crush stenting technique by initially placing a stent in the side branch and a balloon in the main vessel. The side branch stent is then deployed against the main vessel balloon that is later inflated, crushing the side branch stent within the main vessel. The main vessel is then stented and the side branch recrossed for kissing inflations. Seven patients (five males; age range, 47-78 years) with bifurcation lesions were treated using the above-described technique without major complications. Balloon crush of the side branch stent were successfully achieved in all cases without balloon trapping. In six cases where side branch recrossing was attempted, all were successful and kissing balloon inflations were undertaken in five cases. We have demonstrated that the modified crush stenting technique is feasible and can be safely adapted for use in a 6 Fr transradial percutaneous coronary intervention approach.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=15558756

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Percutaneous coronary intervention for bifurcation coronary disease

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Drug-eluting stents for coronary bifurcations: insights into the crush technique

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Sirolimus-eluting stents appear to reduce substantially restenosis following percutaneous coronary bifurcation intervention. The crush technique was devised to reduce restenosis further by improving stent and drug application to the side-branch ostium. We aimed to investigate the performance of drug-eluting stent (DES) platforms with the crush technique, to identify deployment pitfalls, and to clarify the best deployment strategies. Each stage of the crush technique was photographed in a bifurcation phantom. Simultaneous side- and main-branch dilatation (kissing balloons) fully expanded the stent in the side-branch ostium, widened the gaps between stent struts covering the side branch, and eliminated main-branch distortion. With side branches angled at > 70 degrees, sequential (side- then main-branch) inflations may be needed to achieve best results. Postdilatation of the main branch with a balloon of narrower diameter than the deploying balloon caused main-branch stent distortion. These principles applied to all the bifurcation strategies and stent designs tested.

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Rapamycin-eluting stents for the treatment of bifurcated coronary lesions: a randomized comparison of a simple versus complex strategy

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BACKGROUND: Rapamycin-eluting stents (RES) have been shown to reduce restenosis in many types of lesions. However, the ideal strategy for the treatment of coronary bifurcated lesions has not been established to date. This randomized study compares 2 strategies for the RES treatment of bifurcation lesions: a simple approach (stenting the main vessel and balloon dilatation for the side branch [SB]) versus a complex approach (stents for both vessels). **METHODS:** To compare both strategies, a randomized study was conducted in 91 patients with true coronary bifurcation lesions. All patients received an RES at the main vessel, covering the SB. Patients from group A (n = 47) were assigned to balloon dilation of the involved SB (simple strategy); patients in group B (n = 44) were randomized to receive a second stent at the SB origin (complex strategy). There were no differences between groups regarding baseline clinical and angiographic data. **RESULTS:** Major adverse cardiac events occurred in 3 patients from group A (2 non-Q-wave myocardial infarctions and 1 target lesion revascularization). Six-month angiographic reevaluation was obtained in 80 patients (88%). Restenosis of the main vessel was observed in 1 (2%) patient from group A and in 4 (10%) from group B. Restenosis of the SB appeared in 2 (5%) patients from group A and in 6 (15%) from group B. **CONCLUSIONS:** Both strategies are effective in reducing the restenosis rate, with no differences in terms of clinical outcome. Elective SB stenting seems to provide no advantages over the simpler stent jail followed by SB balloon dilation.

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New bifurcation stenting technique: shunt stenting

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The treatment of bifurcation lesions (BLs) is associated with high procedural complication and restenosis rates. Two techniques of BL interventions were compared: the simultaneous kissing stents (SKS) technique, involving 2 stents, 1 in the main vessel and 1 in the side branch (n = 100), and the conventional stent strategy (CSS) technique, involving a stent in the main vessel and provisional stenting for the side branch (n = 100). In-hospital and 30-day major adverse cardiac events were greater in the CSS group, with significantly less procedure time with the SKS technique. The incidence of target lesion revascularization was 5% in the SKS group and 18% in the CSS group (p = 0.007). Therefore, the SKS technique seems to be rapid, safe, and effective for the treatment of medium- to large-size BLs, with a trend toward fewer acute complications and promising mid-term results.

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Restenosis rates following bifurcation stenting with sirolimus-eluting stents for de novo narrowings

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The percutaneous treatment of coronary bifurcation stenoses is hampered by an increased rate of subsequent restenosis. The present study reports on the outcomes of a consecutive series of 58 patients with 65 de novo bifurcation stenoses treated with sirolimus-eluting stent implantation in both the main vessel and side branch. At 6 months, the incidence of major adverse cardiac events was 10.3% (1 death and 5 target lesion revascularizations) with no episodes of acute myocardial infarction or stent thrombosis.

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