BACKGROUND: Conventional percutaneous coronary intervention (PCI) in restenotic lesions after brachytherapy failure is associated with a high recurrence rate of restenoses and revascularizations. Intracoronary brachytherapy using a liquid rhenium-188-filled balloon in de novo or restenotic lesions safely and effectively reduced restenosis rates. We report clinical and angiographic data regarding the safety and efficacy of rhenium-188 brachytherapy in restenoses after brachytherapy failure.

METHODS: Fourteen patients with restenosis after brachytherapy failure received rhenium-188 beta-brachytherapy. Follow-up was performed angiographically after 6 months and clinically after 12 months. Primary clinical endpoint was the incidence of major adverse cardiac events (MACE) defined as any death, myocardial infarction or repeat revascularization in the target vessel within 12 months. Secondary angiographic endpoints were the binary restenosis rate and late loss in the total segment including edge effects at 6 months. RESULTS: The prescribed dose of 22.5 Gy (n=12) or 30 Gy (n=2) was successfully delivered in all patients. In two lesions, a bare-metal stent was implanted. The mean length of the irradiated segment was 40.0±15.7 mm. The mean diameter of the irradiation balloon was 2.96±0.37 mm. Angiographic follow-up was done in 13 of 14
patients. There was no edge stenosis or coronary aneurysm. Within the total segment, late loss was 0.39 +/- 0.64 mm and late loss index was 0.18 +/- 0.40 with a binary restenosis rate of 23%. Twelve months' clinical follow-up was available in all patients, which showed a MACE rate of 7% due to one target lesion revascularization (TLR). CONCLUSIONS: Intracoronary beta-brachytherapy with a liquid rhenium-188-filled balloon in restenoses after intracoronary radiation therapy failure including 12 months combined antiplatelet therapy is safe with respect to vessel thrombosis, late coronary occlusion or aneurysm formation. With limited use of stenting, angiographic and clinical follow-up for repeat brachytherapy were favorable and it is associated with low restenosis and target vessel revascularization rate.