Methods:

08 patients (07 male / 01 female) between 62 and 78 years old with severe symptomatic coronary artery disease (CAD) received autologous endothelial cell (EC) seeded 4mm poly-tetra-fluoro-ethylene (PTFE) vascular bypass grafts for coronary artery revascularization. EC seeded PTFE grafts were used in patients who lacked of suitable own bypass material for coronary revascularization. The PTFE grafts were seeded with autologous ECs in a multiple step procedure prior the elective coronary bypass operation. In local anesthesia a 5cm long segment of a cutaneous vein was harvested. Enzymatically the ECs were removed by 0,2% collagenase. In cell culture with modified Dulbecco’s Eagle Medium (DMEM) the endothelial cells were cultured and multiplied. After 3 to 4 weeks the number of endothelial cells was big enough to cover the luminal surface of a 20cm long 4mm PTFE vascular graft. Prior EC seeding the luminal wall of the PTFE graft was prepared by the application of a matrix consisting of fibrin glue and human recombinant basic Fibroblast Growth Factor (bFGF). In a special rotating device called „endostrabilisator“ the homologous spreading and adhesion of the ECs on the luminal surface of the graft was achieved after 3 to 4 hours. For the constitution of tight junctions between the luminal surface of the graft and the ECs a period of 8 to 10 days of maturation was necessary under cell culture conditions prior implantation. Under extracorporal circulation in cardioplegic arrest with Bretschneider solution bypass surgery was performed using conventionel surgical techniques to perform the end-side coronary anastomoses with running 7x0 prolene sutures.

Results:
The 8 patients received 19 coronary artery bypass grafts. 2 patients had already previous bypass operations with occluded vein grafts. In 1 patient simultaneously the aortic valve was replaced because of severe aortic stenosis. For the revascularization of the left anterior descending artery (LAD) in 6 cases the left internal thoracic artery (LIMA) was used. 12 aorto-coronary bypasses were performed with the EC seeded PTFE grafts to revascularize in one case the LAD, 1x the first diagonal branch (D1), 2x the ramus intermedius (RIM), 3x the first marginal branch of the circumflex artery, 2x the circumflex artery itself and 4x the right coronary artery (RCA). In one patient an additional saphenous vein graft was used to revascularize the RIM. The postoperative course of all patients was without complications. Wound complications and perioperative myocardial infarctions did not occur. After a mean postoperative follow-up of 420 (174 - 717) days all patients are free from angina pectoris and clinically asymptomatic. Angiographic controls of the aorto-coronary PTFE bypass grafts after the operation showed patent bypasses in all cases except one EC-seeded PTFE graft to the RCA which was occluded asymptomatically realized by angiography 20 months after the implantation. All 18 patent EC-seeded PTFE bypass grafts showed angiographically a smooth luminal
borderline without stenotic regions. The angioscopic evaluation confirmed the angiographic results. The endoluminal graft surface was glossy white and smooth without any fibrin, platelet or erythrocyte deposits as the percutaneous transluminal angioscopic evaluation showed.

**Conclusions:**
Further evaluations and a larger population of patients who received an EC-seeded PTFE graft as coronary artery bypass will prove if the encouraging patency rate of 91% in the mean 420 days after implantation will last.

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