

STENTS WITH GROWTH FACTOR SECRETING MSCS ENHANCED RE-ENDOTHELIALIZATION AND DECREASED RESTENOSIS IN SWINE MODEL

Hyun-Kyung

Seoul National University, South Korea

Currently, cardiac stenting is the most effective and least invasive approach to treating the disease. However, in-stent restenosis is a complex chronic side-effect of the stenting treatment. In this study, to reduce stent restenosis and induce re-endothelialization within the artery, we applied coronary stents coated with stem cells secreting angiogenic growth factors via an inducible genome-editing system. After confirming the characteristics of the cells and their adhesion properties on the stents, we transplanted the stents into a swine model to evaluate the restenosis and potential therapeutic use of the stents with stem cells. Restenosis was evaluated via optical coherence tomography (OCT), micro-computed tomography (mCT) and angiography, and re-endothelialization by immunostaining after cardiac stent treatment. Compared to a bare metal stent (BMS) or a parental umbilical cord blood-derived mesenchymal stem cells (UCB-MSC)-coated stent, the stents that had stem cells capable of the controlled release of hepatocyte growth factor (HGF) and vascular endothelial growth factor (VEGF) successfully reduced re-stenosis within the stent and induced natural re-endothelialization. Furthermore, UCB-MSCs exhibited the ability to differentiate into endothelial cells in Matrigel, and HGF and VEGF improved the differentiation. Our study indicates that the stents coated with UCB-MSCs secreting VEGF/HGF reduced the restenosis side effects of cardiac stenting with improved re-endothelialization.

icandoithk@snu.ac.kr

