

Mechano Growth Factor (MGF) Expression and Response to Multiple-Mechanical Stimulation after Biodegradable Stent Implantation

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Abstract: Stent implantation is the most effective method in the treatment of cardiovascular disease which always destroy the integrity of the vascular endothelium and the local mechanical environment at the stent segment was changed, especially the biodegradable stents [1]. In this study, 3D printed biodegradable poly (L-lactic acid) stents were implanted into SD rat abdominal aorta and the endothelialization, intimal hyperplasia, and MGF after stent implantation were studied. Besides, based on the MGF we explored the effects of mechanical stimulation on MGF express in vascular endothelial cells and smooth muscle cells, and also the effects of MGF with different concentrations on proliferation and migration of vascular cells. The results indicated that MGF was clearly expressed in hyperplastic intima, especially around the struts after the stent implantation (Figure 1), and *in vitro* cell experiments show that MGF expression was increased in response to mechanical stimulation and has the ability to promote cell growth and migration (Figure 2). The endothelium repair was completed at 4 weeks after stent implantation, and the stent segment had a small number of intimal hyperplasia with early thrombosis at 1 week. Above all, with the degradation of PLLA the expression of MGF in the stented vascular sites will change response to the multiple-mechanical changes after the stent implantation, effect the proliferation and migration of ECs and VSMCs.

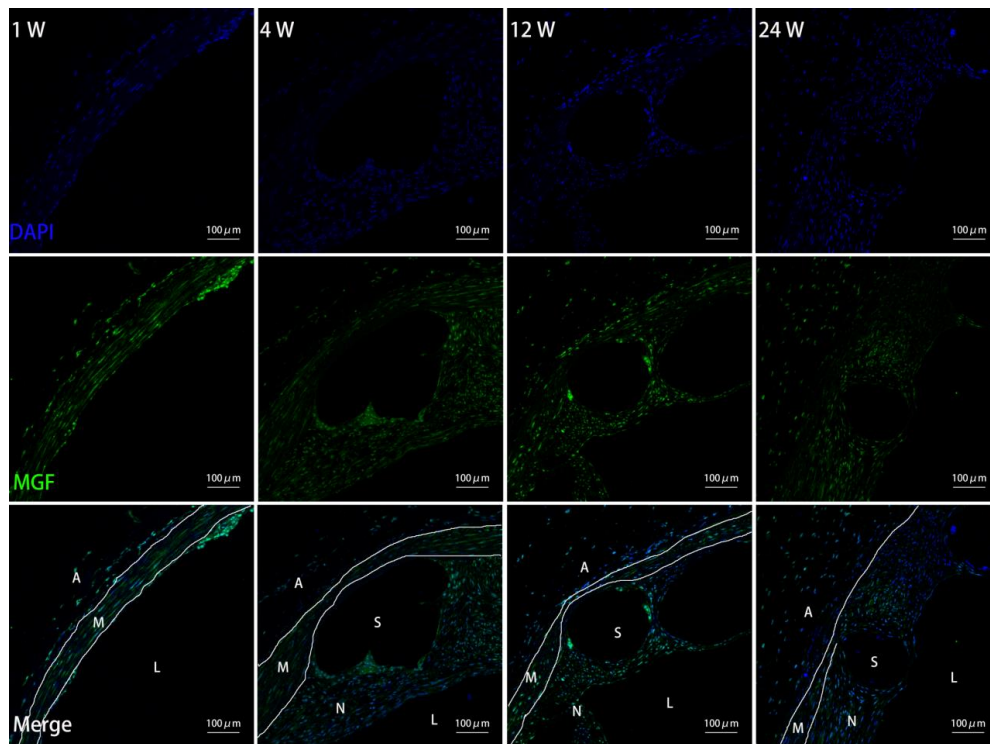


Figure 1. MGF immunofluorescence of vascular segment after stent implantation in SD rat abdominal aorta, S=stent; A= adventitia; M = media; N= neointima; L=lumen. The white line represents the inner plate and outer elastic plate

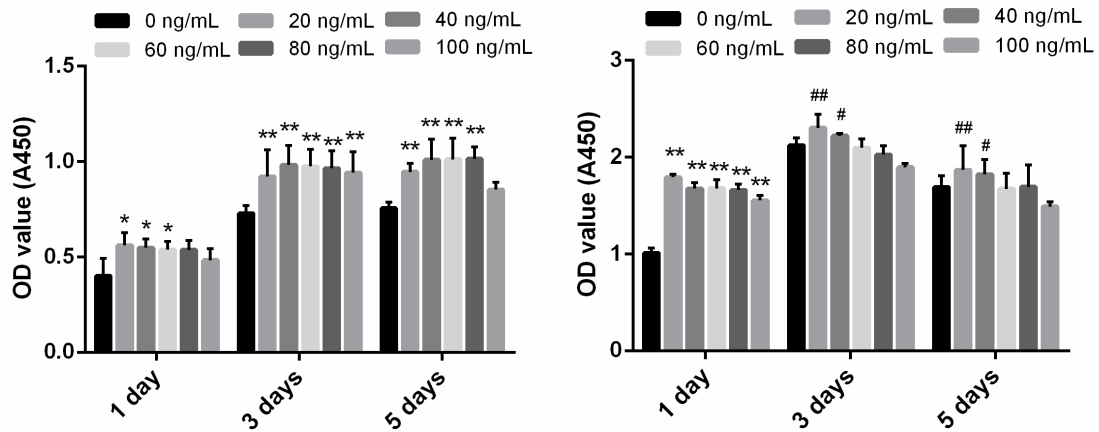


Figure 2. Effects of MGF on HUVECs (A) and VSMCs (B) proliferation (n=6)

*, $p < 0.05$ vs 0 ng/mL; **, $p < 0.01$ vs 0 ng/mL; #, $p < 0.05$ vs 100 ng/mL; ##, $p < 0.01$ vs 100 ng/mL

Keywords: Mechano growth factor; mechanical stimulation; stent implantation.

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References

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