

The Potential Use Of A 3D Coragraf With Poly (Lactic-Co-Glycolic Acid) Microsphere Loaded Human Platelet Derived Growth Factor (PDGF-BB) Scaffold For Treating Bone Defect In SD Rats.

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INTRODUCTION:

Bone provides structural support that allows large organisms to ambulate, protect vital organs and survive. Without it, organisms would undergo detrimental physiological changes that would lead to their death. It is therefore paramount that any bony defects undergo tissue regeneration and restoration as soon as possible. A study was conducted to evaluate the repair outcomes of Coragraf with and without PDGF-BB loaded microspheres and PDGF-BB loaded microspheres on coragraf with the combination of MSC on cranial bone defect in rats to determine if this method would result in superior bone regeneration.

MATERIALS & METHODS:

Harvesting Bone Marrow

Mononuclear cells including MSCs were isolated from marrow of Tibia and femur of SD rats, and the cells were expanded *in vitro*.

Creating Critical size bone defect

Unilateral critical-sized defect were created at the cranium in each rat using micro drills of 5 mm in diameter at low rotation speed.

Transplantation

A combination of MSC and PDGF-BB loaded microsphere on coragraf were transplanted into defect sites. At the end of 4 and 8 weeks post-transplantation, the rats were sacrificed and the bone were harvested for further analysis.

RESULTS:

The regeneration of bone combining MSC and PDGF-BB loaded microsphere on coragraf shows superior bone growth rate compared to the control group.

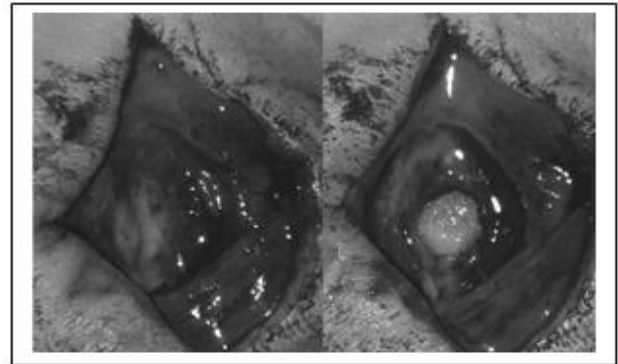


Figure 1

Figure 2

Figure 1: Defect site

Figure 2: Defect site with transplanted scaffold

DISCUSSIONS:

Platelet derived growth factors are source of mitogenic factors. At the traumatized site PDGF stimulate cell growth and differentiation. Coragraf with poly (lactic-co-glycolic acid) Microsphere loaded PDGF-BB scaffold construct facilitate the PDGF release to stimulate the repair phase by enhancing early angiogenesis and bone formation.

CONCLUSION:

Coragraf with poly(lactic-co-glycolic acid) Microsphere loaded Human Platelet Derived Growth Factor (PDGF-BB) is a promising scaffold that trigger rapid bone repair.