PLGA/MH 스캐폴드(scaffold)를 이용한 지방이식술

Fat Graft with Magnesium Hydroxide-Incorporated PLGA Microsphere

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Abstract

Background

Autologous fat grafting is one of the most common procedures used in plastic surgery to correct soft tissue deficiency or depression deformity. However, its clinical outcomes are often suboptimal, and lack of metabolic and architectural support at recipient sites affects fat graft survival leading to complications such as cyst formation and calcification. Extracellular matrix (ECM)-based scaffolds, such as allograft adipose matrix (AAM) and poly (lactic-co-glycolic acid) (PLGA), have shown exceptional clinical promise as regenerative scaffolds. Magnesium hydroxide (MH), an alkaline ceramic, has attracted attention as a potential additive to improve biocompatibility. We attempted to combine fat graft with regenerative scaffolds and analyzed the changes and viability of injected fat graft in relation to the effects of injectable natural and synthetic (PLGA/MH microsphere) biomaterials

Methods

In vitro cell cytotoxicity, angiogenesis of the scaffolds and wound healing were evaluated using

human dermal fibroblast cells. Subcutaneous soft-tissue integration of harvested fat tissue was investigated *in vivo* in nude mouse with random fat transfer protocol Fat integrity and angiogenesis were identified by qRT-PCR and immunohistochemistry.

Results

In vitro cell cytotoxicity was not observed both in AAM and PLGA/MH with human dermal fibroblast. PLGA/MH and AAM showed excellent wound healing effect. *In vivo,* the AAM and PLGA/MH retained volume compared to that in the only fat group. And the PLGA/MH showed the highest angiogenesis and anti-inflammation.

Conclusion

In this study, a comparison of the volume retention effect and angiogenic ability between autologous fat grafting, injectable natural and synthetic biomaterials will provide a reasonable basis for fat grafting.

Keywords: Fat graft, Allograft adipose matrix, PLGA, Magnesium hydroxide, Scaffold

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