

Reconstruction of Human Mandibular Continuity Defects with Allogenic Scaffold and Autologous marrow Mesenchymal Stem Cells

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Background

Mandibular continuity defects occur after tumor resection, maxillofacial injury, or osteomyelitis. Despite the current availability of a plethora of treatment modalities, bone substitutes, and various clinical adjuncts, an exact reconstructive recapitulation of large bony defects continues to be beyond reach. In this clinical pilot study, we report a novel method for reconstruction of mandibular continuity defect by in vivo tissue engineering.

Methods:

In 3 patients with critical-size mandibular bone defects, the allogenic mandibular bone scaffold was customized, loaded by ex vivo expanded mesenchymal stem cells, and transplanted into the surgical defect site.

Results:

According to the bone scintigraphy, vascularized bone was identified in 2 cases. In spiral computed tomography, normal bone healing without significant bone resorption was seen at the 2 viable grafts, but at the failed construction, there was a lack of osteointegration to the adjacent host bone and a higher density in the medullary bone. According to the serial panoramic imaging, the patients with viable bone grafts had normal bone healing, whereas the other patient had progressive overall bone resorption.

Conclusion:

Our results demonstrate the feasibility of allogenic bone scaffold loaded by mesenchymal stem cells in the reconstruction of mandibular continuity defects. Although long-term results are not yet available, it may be a novel method of reconstruction and a basis for further studies.

Keywords: Autologous marrow, Mesenchymal stem cells.

Poster Presentation

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