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A Note on Clinical Study of Bone Marrow Mononuclear Cells

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Editorial

The most frequent congenital bone abnormality is alveolar cleft. The most often used treatment for alveolar cleft repair is autologous Iliac Crest Bone Graft (ICBG), but it is related with door-site morbidity. This study was the first to use beta-Tricalcium Phosphate (-TCP) granules in combination with Bone Marrow Mononuclear Cells (BMMNCs) to repair an alveolar bone lesion. After a year of follow-up, the effectiveness of this approach was compared to autologous ICBG. Three-dimensional computed tomography and computer-aided engineering technology were used to quantify the bone formation volume [1-3].

Introduction

The most frequent congenital bone abnormality is alveolar cleft. For patients with cleft lip and palate, secondary alveolar bone grafting is the normal surgery prior to canine eruption. Alveolar cleft repair helps to restore dental arch continuity, stabilise the maxilla, facilitate subsequent orthodontic treatment, and offer support to soft tissue structures. Iliac crest bone graft (ICBG) is the "gold standard" for alveolar cleft repair. ICBG, on the other hand, is linked to a number of risks, including significant postoperative pain at the donor site, pelvic instability, nerve injury, and infection. Furthermore, the success rate of ICBG-assisted alveolar cleft repair differs significantly between studies Socket preservation, alveolar ridge augmentation5, and guided bone regeneration6 are some of the clinical applications of BTE in dentistry. In BTE, natural and manmade materials, bio ceramics, and metals have all been utilized. These materials, however, come with a number of disadvantages. Collagen, chitosan, and alginate are natural materials with poor mechanical qualities, a quick breakdown period, and a lack of bioactivity essential for hard tissue formation8. During the decomposition of synthetic materials such as polycaprolactone, polylactic acid, polyglycolic acid, and polylactic co-glycolic acid, acidic chemicals are released, which can cause tissue necrosis. Due to their severe brittleness, stiffness, and limited flexibility, bio ceramics such as calcium phosphate bio ceramic, hydroxyapatite (HA), -tricalcium phosphate, and bioactive glass are difficult to shape [4,5].

New techniques for bone regeneration, such as osteo-conductive biomaterials, cytokines, and, most importantly, Bone Morphogenetic Proteins (BMPs), have been attempted to circumvent the aforementioned drawbacks. Autologous bone grafting is a time-consuming and expensive procedure. Stem cell treatment offers a possible alternative. In bone defect repair, a combination of cultivated Mesenchymal Stem Cells (MSCs) and biomaterials is a popular method, and its efficacy has been proven in a variety of animal models. However, cultured graft preparation is a time-consuming technique with significant production costs and a risk of contamination, making regulatory approval for clinical use extremely challenging. Ex vivo culture-expanded MSCs have been used in only few clinical investigations to date.

Conflict of Interest

The authors declare that there is no conflict of interest associated with this manuscript.

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