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Clinical Performance of Carbonate Apatite and Poly (Lactic Acid/Caprolactone) Bilayer Membrane

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Periodontal regeneration has been widely studied to restore the functional attachment apparatus, and various biomaterials have been clinically utilized. Biomaterials such as deproteinized bovine bone mineral and collagen barrier membranes are commonly used and have demonstrated efficacy in periodontal regeneration. However, there are still concerns regarding the quality and safety, particularly potential infections from their animal origin. In Japan, synthetic carbonate apatite bone graft substitutes, which closely mimic the composition of the inorganic component of human bone, have been widely used and have shown promising clinical outcomes in bone regeneration. Tokyo Medical and Dental University was participated in a multicentred clinical trial for carbonate apatite bone graft substitutes and has extensive experience in their clinical use. Additionally, resorbable Poly(lactic acid/caprolactone) (PLCL) membranes with a bilayer structure have been utilized for guided bone regeneration in patients with substantial defects in the alveolar bone and jawbone. To evaluate the performance of the PLCL bilayer membrane with carbonate apatite bone graft substitutes in periodontal regeneration, we conducted a prospective observational study.

The study was a single-arm, blinded, prospective observational study of PLCL bilayer membrane in periodontitis patients with either probing pocket depth (PPD) of 6 mm or more, vertical bone defect of 3 mm or more on dental x-rays, or mandibular class II furcation involvement. The bone defect was covered by the PLCL bilayer membrane after filling with carbonate apatite bone graft substitutes. In this presentation, the efficacy of carbonate apatite bone graft substitute and PLCL bilayer membrane based on the clinical case will be discussed.