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A clinical prospective study on alveolar bone augmentation and dental implant success in patients with type 2 diabetes

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Abstract

Objectives: The objective of this prospective, controlled clinical study was to determine the outcomes of dental implant therapy with staged guided bone regeneration procedures in patients with type 2 diabetes.

Patients and methods: Twenty-four patients were included in the study. Half of the patients were diagnosed with type 2 diabetes mellitus (group 1) while the other half (group 2) of the patients consisted of patients without diabetes. The edentulous maxillary anterior/premolar regions with sufficient vertical height but inadequate horizontal width were treated with staged guided bone regeneration technique and with one or two implant-supported fixed restorations. The patients were followed up at least for 12 months. The parameters that were evaluated were radiographic evaluations on CBCT images and periapical radiographs, histomorphometric analysis, resonance frequency analysis (RFA) and wound-healing parameters. The data were analyzed statistically.

Results: A total of 43 implants were placed in 24 patients (22 implants in group 1 and 21 implants in group 2). The survival rates of implants were 100% for both groups. The success rate of implants was 95% for group 1 and 100% for group 2. None of the parameters including CBCT findings, RFA values, success rates and wound-healing scores showed a significant difference between the two groups.

Conclusion: Staged guided bone regeneration is a feasible augmentation procedure for the treatment of horizontal bone deficiencies of the maxillary anterior/premolar regions in well-controlled type 2 diabetic patients.

Diabetes mellitus (DM) is a chronic disease characterized with hyperglycemia and deranged metabolism, which result in various serious complications including acquired blindness, kidney failure, neuropathy, myocardial infarction and non-traumatic limp amputation. It is a worldwide epidemic disease with a prevalence of as high as 15–22% in Turkey (Satman et al. 2013). The major subtypes of the disease are type 1 and type 2 DM. While type 1 DM develops most commonly with autoimmune pancreatic β-cell destruction and accounts for 5–10% of the diabetic population, type 2 DM is associated with insulin resistance and relative insulin deficiency with various metabolic disturbances and accounts for 90–95% of the diabetic subjects (Scully & Cawson 2005). Because of the microvascular complications seen in DM, it is considered as a relative contraindication for dental implant therapy by some authors (Dowell et al. 2007). Therefore, success of dental implants in patients with diabetes has been the topic of many preclinical and clinical studies (Farzad et al. 2002; Mealey 2006; Erdogan et al. 2010).

It is known that DM is associated with increased rate of periodontal disease and bone resorption (Mealey 2006). Safety of implant therapy with or without bone augmentation procedures in patients with diabetes is still controversial. The literature contains some data about the success rate of dental implants in non-augmented bone. The success rate of dental implants in patients with DM varies between 68% and 100% (Tawil et al. 2008; Erdogan et al. 2010). The data regarding the success rate of alveolar bone augmentation in DM are less conclusive. Clinical studies, which evaluated the outcomes of bone augmentation techniques, most commonly excluded patients with DM. Limited number

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