Radiographic bone density around immediately loaded oral implants
A case series

Key words: titanium dental implants, immediate loading, radiographical examination

Abstract:
Objectives: The aim of this study was to analyze the bone density around immediately loaded oral implants by a new volumetric CT scan (Maxiscan) and to compare it with that of unloaded implants.

Material and methods: Four patients with an age range from 44 to 65 years old were selected for this study. All the patients needed a prosthetic rehabilitation in partially edentulous posterior maxillas or mandibles. A total of 12 oral implants were placed in the four patients. Six of these implants were immediately loaded while six were left unloaded. Six months after placement, immediately loaded and unloaded oral implants were analyzed by a volumetric CT scan.

Results: The overall success rate in this study with immediately loaded oral implants was 100%. The radiological assessments showed that the mean densitometric profile, which is a measure of bone mineralization, was higher in the immediately loaded group than in the unloaded group. The differences observed between the two groups of oral implants (immediately loaded and unloaded) were statistically significant (P<0.05). The bone was significantly more dense around immediately loaded than unloaded oral implants on the basis of a radiological assessment.

Conclusion: The innovative aspect of this clinical study is to propose a new method to analyze the bone density, reducing the need for histological analysis from human biopsy.

The delayed loading protocol for osseointegrated oral implants had a rationale based on the consideration that premature loading of dental implants may lead to fibrous encapsulation instead of direct bone–implant interface (Bränemark et al. 1977; Albrektsson et al. 1981). During the 3–6 months of healing the patient needs to wear a denture or other removable partial prosthesis, requiring several soft relines. This could add additional visits and cost to the final rehabilitation, and also could increase the discomfort for the patient because of the additional time required to complete the prosthetic treatment and the difficulties of wearing a temporary prosthesis. The findings from clinical research have supported the idea to shorten the healing period, and immediate loading protocol has been introduced. In a study using monkeys, some authors (Piattelli et al. 1998) placed 24 oral implants immediately loaded and 24 oral implants left unloaded and used as a control. Nine months later, a histomorphometrical analysis was performed. All oral implants healed and the bone–implant contact percentage was greater in the immediately loaded implants than in the unloaded implants. The authors concluded that these results could be due to the 'beneficial role of relative micromovement in stimulating bone formation in periimplant location'.

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