CLINICAL ORAL IMPLANTS RESEARCH

Clinical and radiographic success rate of locking-taper implants placed on focal osteoporotic bone marrow defect patients. A longitudinal study

M. Simancas,[1] M. Marincola,[1] G. Lombardo[2]
[1]*University of Cartagena, Cartagena, Colombia,* [2]*The University of Verona, Verona, Italy*

Background: Focal Osteoporotic Bone Marrow Defects (FOBMD) is described as a radiolucent area that is pathologically consistent with hematopoietic tissue in sites where an extraction has occurred. This disease is asymptomatic and it's accidentally detected during radiographic analysis or any surgical procedure as dental implant placement. In a radiographic wise, it is localized, cortically demarcated that varies in size, shape and trabecular pattern. Having this in mind, the bone quality related with those areas can be poor which represents a challenging situation for clinicians on implant dentistry. FOBMD should be detected in the planning stages in order to avoid related complications as nerve damage, infection and implant displacement to a deep position that could represents also a prosthetic complication.

Aim/Hypothesis: The aim of this observational retrospective longitudinal study is to describe the clinical and radiographic success rate of locking-taper implants placed on Focal Osteoporotic Bone Marrow Defects (FOBMD) patients in an area of Colombia, South America and its clinical implications for implant dentistry.

Material and methods: For this study we included 32 patients with FOBMD diagnosis. Patients were selected on the basis of a radiolucency presence in the posterior region of the jaws which was confirmed in the surgical implant placement. One trained oral surgeon placed 51 locking-taper implants (Bicon Dental Implants™., Boston MA., USA) on these patients. On a small sample of these 32 patients pathological samples were obtained and stored in a vial containing formaldehyde. Then pathological reports were obtained using haematoxylin-eosin technique by one experienced pathologist blinded to the clinical procedure and patient information. Additionally, a trained and calibrated dentist performed the clinical and radiographic evaluation of the patients. Clinical variables included implant-related complications. Radiographic outcomes comprised implant-surrounding radiolucency, implant displacement and bone loss. These radiographic examinations were performed using digital radiography with parallelism technique (Dr. Suni., Suni Medical Imaging., USA). Clinical and radiographic measurements were performed through a standardized questionnaire designed by the research team. Statistical analysis was performed through descriptive statistics for quantitative and qualitative data. Association between qualitative variables was obtained using Fisher's exact test with a type I error degree of 0.05. All calculations were performed using the Stata v.13.1 for Windows statistical package (StataCorp™., Texas., USA).

Results: 22 of the patients were females for 68.7% of the sample with an overall age of 54.7 ± 11.8 years. The mean follow-up time after implant placement was 20.9 ± 8 months. It was placed one implant in 59.3% with a natural tooth as a neighbor in 35.2% and replacing a lower teeth in the 93.7% of the cases. The most frequent tooth extraction reason was previous endodontic treatment/infection in 82.3% (CI 95%:68.8–90.7) of the cases, additionally the mean time since the extraction was 117.9 ± 91.3 months. Pain and implant displacement occurrence were 3.9% (CI 95%: 0.93–14.9). Other findings were bone loss and implant placed in proximity with a natural tooth. Histological findings showed calcification areas surrounded by hemorrhage, dystrophy and inflammatory cells in the samples. One implant was considered as failure due to fiber-integration. Thus, the overall success rate was 98% (CI 95%: 86.5–99.7). Neither the demographic or clinical parameters were associated with implant failure ($P > 0.05$)

Conclusions and clinical implications: FOMBD is a frequent pathology that should be detected in early stages of the implant treatment. Its presence is highly related with previous extractions and endodontic treatment sites and its treatment must be performed having in mind the extension of the lesion, some cases could be treated in conjunction with bone graft in order to maximize the implant stability. Nevertheless our results show that a high survival rate can be achieved considering the adequate treatment planning for the patients.