Decision making in implant dentistry: An evidence based analysis

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Implant-supported prostheses have become the treatment of choice in an increasing number of patients, however, this model of treatment remains controversial under which conditions retaining a tooth may be futile and replacing a tooth with an implant-supported prosthesis may be considered over-treatment. Decision making is an essential part of oral health care. A model for the factors influencing decision in healthcare was described in 2000 by Chapman and Sonnenberg and has been adapted to discuss decision making in implant dentistry. This model describes two major components, the normative and the descriptive approach, which are involved in decision making. The normative aspect relies on quantitative information derived from systematic reviews and predictive models on the probabilities of treatment outcomes. The descriptive aspect in decision making involves cognitive processes and biases of both providers and patients that translate the normative information into clinical action. In implant dentistry, the evidence based and decision analysis constitute two major approaches in treatment planning. Recently, a number of systematic reviews have been published regarding the success and survival rates of teeth following periodontal and endodontic treatments and of dental prostheses supported by teeth or implants. This review does not intend to replicate these systematic reviews; instead this presentation will focus on building upon the complied information, synthesize the provided data and apply them in a clinical context to establish the decision making process at the provider-patient level to assess which may offer greater benefits, namely treating diseased teeth with the goal of retaining them or extracting diseased teeth and replacing them with an implant-supported fixed dental prostheses.

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Immediate placement and loading of maxillary single-tooth implants: A 3-year prospective study of marginal bone level

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Background: Prevention of marginal bone loss following loading is of upmost importance in maintaining stable peri-implant tissues and preservation of final esthetic outcome of the restoration. Clinical reports have suggested that immediate placement of provisional crowns cemented on final abutments offered additional clinical control over soft tissue architecture. Introduction of Computer Aided Design / Computer Aided Manufacturing (CAD/CAM) technology to the dental field widened the scope of the design and application of all ceramic restorations. Prediction of optimal implant position with respect to anatomical limitations and prosthetic principles, such as occlusion and function, is becoming a basic integrated feature in the software module of many CAD/CAM systems.

Aim/Hypothesis: The purpose of this study was to evaluate marginal bone level around single-tooth implants placed in anterior maxilla and immediately restored.

Material and Methods: 20 Implants were placed in 20 patients (8 men and 12 women) that were selected for this study. Following atraumatic non-surgical extraction of tooth, all patients immediately received implant and the definitive prefabricated abutment was placed. Implant position was transferred to the scanning unit of the CAD/CAM system using prefabricated surgical guide. Temporary crowns were immediately fabricated and cemented. Eight weeks later final crowns were luted. Outcome assessment as implant survival and level of marginal bone radiographic evaluations were performed at 8 weeks, 1 year and 3 years time period after loading.

Results: All implants placed osseointegrated successfully after 3 years of functional loading. The mean marginal bone loss was 0.16mm (SD, 0.167mm), 0.275mm (SD, 0.171mm) and 0.265mm (SD, 0.171mm) at 8 weeks, 1 year and 3 years time period respectively. Four out of the 20 implants showed no bone loss.

Conclusions and Clinical Implications: Immediate loading technique using the final abutment directly eliminated the need for a second stage surgery and prevented interruption of soft and hard tissue at implant neck, which resulted in better soft tissue response and reduced marginal bone loss.

Clinical significance: Immediately loaded implants, in fresh extraction sockets by insertion of a provisional restoration on the titanium abutment without any later manipulation, helped to protect the initially forming blood clot and presented a template for soft tissue contouring that resulted in significant reduction of marginal bone resorption and maintenance of soft tissue architecture.