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Evaluation of the immediate implant placement in fresh extraction socket

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In

Oral and Maxillofacial Surgery

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Abstract

Background: dental implant is the most reliable method to replace missing teeth. In the traditional protocol the patient should wait up to six months to place the implants in a healed bone, this waiting time may also accompanied by alveolar changes resulting in loss of bone width and height by varying degrees, make the placement of implant fixtures in the ideal position more difficult which may require additional advanced procedures to overcome these problems. In order to decrease waiting time and prevent alveolar changes after extraction, immediate implants placement into the teeth extraction sockets was introduced.

Aims of the study: to evaluate the outcome of immediate implant placement in fresh extraction socket, utilizing Resonance Frequency Analysis (RFA) to quantify implant stability and osseointegration. To study the effect of presence of chronic periapical infection, bone defects and gaps on the treatment prognosis.

Materials and Methods: the study started from November 2014 to September 2015 a total of (23) patients participated in the study, receiving a total of (44) implants placed in the sockets of teeth indicated for extraction by means of two stages implant placement protocol. Clinical and radiographic preoperative assessment were accomplished for each patient. The dental implant system used was (Dentium Co., korea), Beta-tricalcium phosphate (β-TCP) (Zizine laboratoire, France) was used to fill gaps ≥ 2 mm and bone defects, and collagen membrane (Genoss Co., Korea) used to cover the surgical area before flap closure. Osstell^{TM} ISQ (Goteborg, Sweden, 4th generation) was used to measure implant stability at the time of surgery (baseline) and at (16 weeks) during second stage surgery. Postoperative periapical radiograph and panoramic view accompanied with clinical evaluation were applied for all cases. T-test, paired t-test, and Pearson Correlation were the analytical methods used to assess the data.

Results: twenty-two patients received (41) implants included in the study and completed the follow-up period. All implants were survived (100% survival rate) with no signs and symptoms of failure. The mean and standard deviation of the primary implant stability of the immediate implants was (65.32±9.50). The mean and standard deviation of the secondary implant stability at 16 weeks was (69.78±7.15). From the statistical point of view, paired samples statistics showed highly significant increase in the implant stability ($P<0.01$) from baseline to 16 weeks. The principle of Guided Bone Regeneration (GBR) utilized in (63.4%) of cases to repair bone defects and fill gaps ≥ 2 mm. Fourteen implants, (34.1%) of implants had been inserted in the extraction sockets of teeth with chronic periapical lesion. Statistical analysis of the cases that used GBR versus cases without GBR, implants in infected sites versus implants placed in non-infected sites, showed no significant difference neither at baseline nor at 16 weeks. Paired samples statistic showed that the increase in the mean ISQ value was highly significant in cases of implants inserted into periapical infected sockets and the increase significant in cases where GBR were used. Correlation showed that implant length negatively affect ISQ values at baseline while implant diameter positively affect ISQ values at 16 weeks. Patients age, gender, have no effect on ISQ values. Spontaneous implant exposure observed in (31.7%) of cases. Analysis showed no statistical correlation between patient's gender, GBR, and bone dehiscence with early implant top exposure, which in turn showed no effect on the survival outcome and implant stability.

Conclusions: within the limit of the time of this study and the number of the available samples, immediate implant placement in a fresh extraction socket is a predictable treatment approach, have the benefit of reducing treatment time, and the number of surgical procedures and can be applied even in the presence of chronic periapical lesion or bone defect, with the same final results when careful preoperative assessment and appropriate intraoperative protocol are utilized.