Immediate loading of tantalum-based implants in fresh extraction sockets. Long-term outcomes

Cristian Peron1; Georgios Romanos2
1Private Practice, Italy; 2Stony Brook University, United States

Background: Immediate implant placement into fresh extraction sockets especially in the esthetic areas has reduced treatment time, surgical time and increased the comfort of the patient. This is achieved thanks to improvements in implant design and using a precise surgical and prosthetic protocol. The Tantalum-based implant (Trabecular Metal Implant, Zimmer-biomet, Usa) is made with a midsection of Tantalum based biomaterial, that is 80% porous, with a trabecular structure designed for bone ongrowth and bone ingrowth.

Aim/Hypothesis: This 4 year retrospective study was conducted to evaluate clinical efficiency and radiological evaluation of immediate placement and occlusal loading of single-tooth restorations on hybrid titanium dental implants with highly porous, unthreaded, tantalum-based midsections in fresh extraction socket.

Material and Methods: A retrospective review of patient records was conducted in a single private-practice setting based on an extensive patient informed consent. Single, non-restorable teeth were atraumatically extracted using an incision-free, flapless technique. Reasons for extraction included crown root fractures, deep caries and or endodontic failures. Immediate implants were lingually placed 3–4 mm apically to the free gingival margin within the extraction sockets and the gaps around the implants were grafted with cancellous particulate allograft (Puros, Zimmer-Biomet, Usa). Length of the implants ranged from 10–13 mm and implant diameter ranged from 3.75 to 4.70 mm. Temporary acrylic resin crowns delivered immediately (screw-retained) and placed into occlusion. Two weeks later, implants were definitively restored with glass ceramic crowns.

Results: Twenty-six patients having one non-restorable tooth were treated (n = 26). Most implants were placed in maxillary (n = 16 26) and premolar (n = 17 26) locations, and in lower density (Type 3) bone (n = 23 26). All implant insertion torque levels were >40 Ncm (n = 26 26). Mean ISQ values were 71.6 immediately after placement. All implants were provisionalized immediately with screw-retained crowns (n = 26 26). Pink Esthetic Scores were 13.4 at 1 year and 13.0 at the 4-year follow-up. Mean peri-implant probing were 2.35 ± 2.40 mm at 1 year and 2.92 ± 2.6 mm at 4 years of follow-up. Mean crestal bone loss was 0.58 ± 0.34 mm at 1 year and 0.87 ± 0.36 mm at the 4-year follow-up. Implant survival and success rates were 100% (n = 26 26), respectively, with a follow-up time of 4 years. There were no irresolvable complications. All patients reported full satisfaction for mastication function, phonetics and esthetics.

Conclusions and Clinical Implications: Within the limits of this retrospective study, the use of Tantalum-based Implants in post-extraction sites with immediate provisional restorations seems to be a safe and predictable procedure over the long-term with stability of hard and soft tissues.