Immediate Loading of Tantalum-based Implants Placed in Multi-Rooted Maxillary Fresh Extraction Socket. 6 Years Clinical and Radiographic Outcome

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Abstract

Immediate implant placement into fresh extraction socket have reduced treatment time, surgical procedure, and it has increased the comfort of the patient. This is achieved thanks to improvement in implant designs and using a right surgical and prosthetic protocol. The Trabecular Metal (TM) Implant is made with a midsection of Tantalum based biomaterial, that is 80% porous, with a trabecular structure designed also for bone in-growth and bone on-growth .

Background and Aim

This retrospective study was conducted to evaluate the clinical and radiological outcome of immediate loading of hybrid titanium dental implants with highly porous, unthreaded, tantalum-based for single-tooth placed in multi-rooted maxillary fresh extraction sockets.

Variable	Outcome	Summary
EXTRACTION REASONS	Fracture	23,8% (n=5/21)
	Deep Caries	42,8% (n=9/21)
	Endodontic Failures	23,8% (n=5/21)
	Chronic Periodontitis	9,6% (n=2/21)
IMMEDIATE IMPLANTS	Maxilla	100%(n=21/21)
BONE DENSITY	Type III	90,4%(N=19/21)
	Type IV	9,6%(N=2/21)
IMPLANT DIAMETER (mm)	4.7 mm	80,9%(n=17/21)
	6.0 mm	19,1%(n=4/21)
IMPLANT LENGTH (mm)	10.0 mm	57,1%(n=12/21)
	11.5 mm	33,3%(n=7/21)
	13.0 mm	9,6%(n=2/21)
FINAL INSERTION TORQUE (Ncm)	>40 Ncm	100%(n=21/21)
ISQ	Placement	71.3+-2.4 ISQ (range 69.0-73.0)
TYPE OF FINAL CROWN	Cemented	33,3% 7/21
	Screw-retained	66,7% 14/21

Methods and Materials

A retrospective review of patient records was conducted and patients records were reviewed to identify all subjects, who had been treated with an immediate single trabecular metal implant.

Twenty one implants were placed immediately after teeth extractions. Single, non restorable multi-rooted teeth were atraumatically extracted using an incision-free, flapless technique. Reasons for extraction included crown/root fractures, deep caries, chronic periodontitis and/or endodontic failures.

Implants were placed in the center of the extraction sockets and 3-4 mm apically to the free gingival margin. The gap around the implants were grafted with cancellous/cortical mineralized allograft. The length of the implants ranged from 10-13 mm and the implant diameter ranged from 4.7 to 6.0 mm, An immediate temporary screw-retained crown was immediately delivered and placed onto the implants. Four months later, implants were definitively restored with screwed-retained glass ceramic crowns.

CASE 1 1) Maxillary molar with crown/root fracture, 2) Immediate TM implant with immediate provisional restoration, 3) Rx 1 Y follow-up, 4) Rx 3 Years follow-up 5) Rx 6 Years Follow-up 6) Soft tissue stability after 6 years of loading, with a cemented lithium di-silicate crown.

CASE 2 1-2) Maxillary molar with deep caries and crown/root fracture, 3) Immediate TM implant with immediate provisional restoration, 3) Rx 1 Y follow-up, 4) Rx 3 Years follow-up 5) Rx 6 Years Follow-up 6) Soft tissues stability after 6 years of loading, with a screwed lithium di-silicate crown.

Results

A total of 21 patients (15 female, 6 male) with a mean (SD) age of 62.2 (range: 30-69) years were treated with 21 implants and monitored for a follow-up time of 6 years. All implants were placed in maxillary molar (n=21/21) locations, and in lower density bone. All implants achieved 40 Ncm of insertion torque (n=21/21) and mean ISQ values were 71.3 immediately after placement. Implant survival and success rates were 100% (n=26/26), respectively after 4 years. Pink Esthetic Scores were 13.4 at 1 year and 13.0 at the 6-year follow-up. Mean crestal bone loss was 0.48 mm +- 0.34 at 1 year and 0,889 mm +- 0.31 at the 6-year follow-up. Implant survival and success rates were 100% (n=21/21), respectively, with a follow-up time of 6 years. There were no irresolvable complications. All patients reported full satisfaction for mastication function, phonetics, and esthetics.

Conclusion

With the limits of this retrospective study, the use of Tantalum-based Implants in post-extractive multi-rooted sites with immediate provisional restoration turns out to be a safe procedure and predictable over the long-term with stability of hard and soft tissues.

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