



Immediate placement of implants and acrylic temporary crowns for single tooth replacement of maxillary incisors

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Introduction

Experimental and clinical studies were published in the last few years on early and immediate implant loading protocols. The main factors affecting the final outcome were: 1) bone quality 2) surface of the implant 3) design of the implant 4) occlusal load 5) immobilization of implants immediately after surgery.

A clinical and radiographic study was performed to evaluate the treatment outcome of a single upper incisor replacement with a crown retained to an implant installed immediately at the time of the extraction of the tooth and with the placement of a temporary acrylic crown within six hours following implant insertion.

Materials and methods

In this up to 24 months follow-up study 9 consecutive patients (4 males and 5 females ranging in age from 24 to 56) underwent extraction of one upper incisor, 5 central and 4 lateral; the cause of the extraction was root fracture.

The selection criteria were: 1) Patients with no chronic systemic disease 2) Non smoking patients. 3) No significant bone loss in the extraction site and in the adjacent teeth. 4) At least 13 mm of total bone height and 4 mm of bone height beyond the root apex. 5) Good primary stability of the implants. Patients took one gram of Amoxicillin 3 hours before surgery and one gram every 12 hours for six days after; Chlorhexidine rinses for two minutes before surgery and twice a day for 7 days were prescribed.

Surgical procedure: No incisions were made. A fibrotomy preceded delicate tooth removal with no trauma to the alveolar bone. The length of the implant was decided by measuring by a periodontal probe the extraction socket (distance between the gingival margin and bone added to the height of bone apical to the socket); the reference point was the buccal gingival margin. The head of the implant was placed 2 to 3 mm apical to the margin. The preparation of bone site was done with drills and/or osteotomes depending on bone quality and quantity.

FRIALIT®-2 implants of diameter 4.5 mm and 5.5 mm were used; when needed small autogenous bone chips (drilling debris) were used to fill the gap between implant and bone socket. FRIALIT®-2 ProTect temporary abutments were screwed to the fixture. They were individually prepared and the shoulder of the abutments carved to follow the anatomy of gingival margins. Acrylic temporary crowns were prepared and adjusted to perfectly fit to the abutment shoulders and gingival margins, then cemented with a temporary cement. At this moment buccal and lingual soft tissue edges were sutured to enable maximum adaptation of soft tissues to the crowns. No contact between the temporary crowns and the teeth of the opposite arch was allowed in maximal intercuspidal position and in protrusion and lateral movements. Follow-up visits were performed once a month for six months. Six months later the temporary crowns were replaced with single tooth ceramo-metal crowns, and follow-up was on a three months schedule.

Patient	Age	Implant diameter	Implant length	Site	Bone quality	Complications	Follow-up
1W	38	4.5	13	22	2	no	18
2W	53	4.5	13	12	2	swelling	21
3M	41	5.5	13	21	3	no	24
4M	55	5.5	13	11	3	failed	
5M	36	4.5	13	12	2	no	18
6W	24	4.5	13	11	3	swelling	18
7M	49	4.5	15	12	2	no	12
8M	56	5.5	13	21	3	no	21
9W	42	5.5	15	11	2	no	15



Results

Healing after extraction and implant placement was generally uneventful. Only a minimal swelling was seen in two patients. The table shows the characteristics of patients, sites, bone quality, implants and follow-up.

One implant did not integrate, showing abnormal mobility two months after placement. It was extracted and after 40 days another implant was successfully placed. All the others remained stable with no bone loss or probing increase at every subsequent follow-up control. Radiographically all the implants were surrounded by bone at the time of the final restoration.

Discussion

The elimination of the second stage surgery, the absence of a temporary removable appliance and the better maintenance of soft tissues are the most important advantages of this one stage procedure. Further studies as controlled multicentric studies should be performed before this procedure can be recommended for general use.

Three cases of root fracture showed clinical and radiographical signs of infection; after the extraction a careful curettage of the alveolar socket and antibiotic solution rinsing was performed. The healing process was uneventful and all three cases were successful. However failure risk in these cases should be carefully investigated.

References

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