

IMMEDIATE PLACEMENT IN EXTRACTION SITES FOLLOWED BY IMMEDIATE LOADING: A PILOT STUDY

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Introduction

Studies by Schitlman, Henry & Rosenberg, Randow et al have demonstrated excellent success rates when immediate loading was accomplished in the mandible. Tarnow et al have shown success in the maxilla as well. With the information gathered from studies of early and immediate loading, the authors decided to proceed with immediate loading on selected cases in a private practice setting.

Since 12/98, we selected a small group of patients for immediate or early loading. We placed 103 implants in 13 jaws of 11 patients. Two of the patients received implants in both the maxilla and mandible. Of the 103 implants

placed, 37 were placed in immediate extraction sites. Thirty-two of the thirty-seven that were placed in immediate extraction sites were loaded in less than 3 weeks. Of the total 103 implants placed 87 were loaded early (less than 3 weeks). Three implants have been lost to date. The remaining 16 implants were buried and allowed to heal in the customary fashion. None of the buried implants failed. One of the implants lost was in an extraction site and two were in non-extraction sites.

Patients were selected with care to ensure the Aires/Berger Protocol could be met.

Aires/Berger Protocol

1. A minimum of 7 implants in the maxilla and 4 in the mandible were required.
2. Multiple implants
3. Minimum length 10mm
4. Cross arch splinting with heat-cured provisionals
5. Widest possible anterior-posterior distribution should be sought.
6. Cemented provisionals
7. Small cantilevers permitted.
8. Implants were deemed suitable for immediate loading according to the surgeon's decision on primary implant stability.
9. In implant sites with inadequate bony height and with bone grafting was accomplished. The implants were inserted and loaded only where primary implant stability was achieved.

A total of 103 implants were inserted in 13 jaws of 11 patients. Forty-nine implants were inserted in the maxilla and 54 in the mandible. Of the 103 inserted 87 were immediately loaded.

Clinical Steps

Implants were inserted in the normal fashion. In some cases abutments were inserted immediately. Heat cured provisionals were fitted and cemented at the time of surgery. In other cases impressions of the implants were made. Study casts with implant analogues were fabricated and abutments chosen. Heat processed provisionals were then fabricated and inserted usually within 7-10 days after surgery. Provisionals were cemented with Temrex[®] (Temrex Corp., New York, USA) cement, and not removed for at least 3 months. Definitive prosthodontic treatment was accomplished at 4-6 months post surgery.

Case Presentation 1

1. A 57-year-old woman presented for treatment with advanced periodontal disease in both the maxilla and mandible.
2. A normal nasomaxillary complex with good support of the upper lip was present. Nasolabial angle was normal.
3. The mandible demonstrated significant mandibular hypoplasia. The patient had redundant sub mental soft tissue with sub mental lipomatosis.
4. Intraoral examination revealed a full class II malocclusion with severe generalized periodontal disease. There was flaring of the anterior mandibular teeth to compensate for the class II malocclusion. Many of the teeth exhibited excessive mobility and pockets ranging from 7mm to 10mm.

Surgical Treatment

The planned surgery involved the following steps in sequence:

1. Bilateral sagittal split osteotomy of the mandible
2. Extractions of all the teeth.
3. Bilateral sinus lifts
4. Inserting 20 implants (10 in the maxilla, 10 in the mandible).

The implants to be loaded were determined by doing a reverse torque test at the time of the implant insertion. A reverse torque test at a minimum of 15 Ncm was required. After deciding which implants would be loaded, the transfer copings were prepared on the master casts to accept a cemented provisional heat-cured acrylic bridge.

Heat cured acrylic provisional bridges were fabricated. Three weeks post operatively, the healing abutments were removed and temporary metal abutments placed to support the provisional bridges. The occlusion was meticulously adjusted in the mouth to insure bilateral centric stops on as many teeth as possible. Lateral excursive movements were adjusted to minimize any forces on one particular implant. Incline planes of the working cusps were kept relatively flat. This reduced any excessive lateral excursive forces on the implants. Protrusive guidance was adjusted to involve as many anterior teeth as possible. The provisional fixed bridges were cemented with Temrex[®] cement. The patient was seen one week post-cementation to check her oral hygiene and make minor occlusal refinements.

Final Prostheses Fabrication

Six months after implant placement the buried implants were uncovered. One of the 20 implants was mobile at the time of surgery and was removed. This implant was of a small diameter (3.8mm) and 15mm in length in the area of the maxillary right second premolar. A bite registration and a face bow recording were made. Final impressions were made. A full contour diagnostic wax-up was achieved before abutment selection. Appropriate abutments were selected and, where necessary, custom abutments were fabricated. Some of the implants, especially in the maxilla were angled facially relative to the other implants. These implants required angled abutments; this improved the emergence profiles of the restorations. All of the abutments and metal copings were fitted in the mouth. Wherever possible, the implants were kept as single units or short span fixed bridges.



Orthopantomogram demonstrating advanced periodontal disease.



Lateral intraoral view of splayed maxillary incisors.

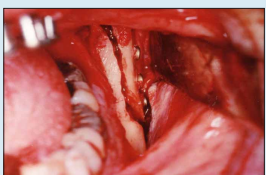


Photo demonstrates the sagittal split osteotomy rigidly fixed with bicortical fixation screws.



Surgical guide with metal ring inserts.



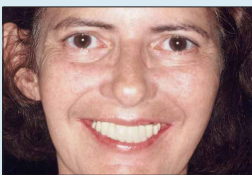
Lateral cephalometric radiograph demonstrating a full skeletal class II malocclusion.



Lateral cephalometric radiograph demonstrating the advancement of the mandible into a class I occlusion.



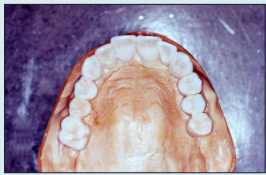
Provisional bridges placed at 3 weeks postoperative.



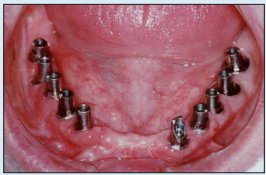
The patient, as she appears 1 week after seating of the provisional bridges.



Full Contour diagnostic wax-up.



Full Contour diagnostic wax-up.



Final mandibular abutments seated in the mouth.



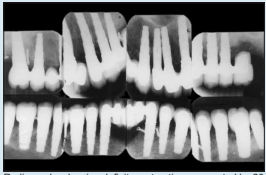
Individual crowns fabricated for all the posterior teeth. A fixed bridge spans implants no. 22 thru no. 27.



New Class I occlusion obtained.



Maxillary implant bridges seated in the mouth.



Radiographs showing definite restorations supported by 20 FRIALITY-2 implants.



Patient's new smile with definite restorations.

Case Presentation 2

A 62 year old male presented with the following:

1. A removable partial upper denture and 5 remaining anterior teeth with moderate to advanced bone loss.
2. A failing F.P.D (17-21)
3. The patient presented with a history of bruxism.

SURGICAL AND PROSTHODONTIC SEQUENCE.

1ST STAGE. Teeth #'s 6, 8, 9, 10, 11 were extracted. Ten implants were inserted and bone grafting accomplished in areas of inadequate bone. Impressions of the implants were made at the time of implant insertion. Master casts were poured and appropriate abutments selected and modified. Three implants were deemed not suitable for immediate loading (3,9,14). Teeth #17 and #20 were extracted and 4 implants inserted and submerged in the usual fashion. Heat processed acrylic provisionals were fabricated extending from tooth #4-13. A Bruxes night appliance was also fabricated.

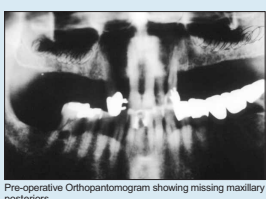
TREATMENT PLAN:

MAXILLA - Extraction of the remaining teeth and insertion of 10 Implants to support an immediate provisional cemented F.P.D.

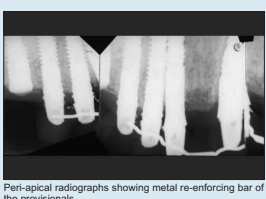
MANDIBLE - Extraction of #17 and #20 and the insertion of 4 implants to be left submerged in the usual fashion.

One week post-op the provisional F.P.D. was cemented with Temrex cement. The occlusion was meticulously adjusted to eliminate any interference from one particular tooth (implant).

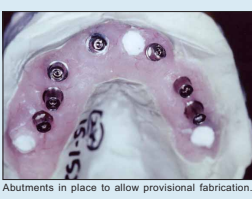
2nd Stage-The 3 submerged implants were uncovered. All 10 implants were deemed to be integrated. Definitive F.P.D.'s were fabricated in two sections (3-7) and (8-14). The patient is now 2 years post-op with no complications.



Pre-operative Orthopantomogram showing missing maxillary posteriors.



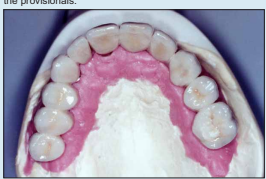
Peri-apical radiographs showing metal re-enforcing bar of the provisionals.



Abutments in place to allow provisional fabrication.



Provisionals and night appliance seated one-week post-op.



Definite restorations on the working cast.



Orthopantomogram of completed implant restorations supported by FRIALITY-2 and XVI^E implants (DENTSPLY Friadent, Mannheim, Germany).

Results

Starting in December 1998, a total of 103 implants were inserted. 49 were inserted in the maxilla and 54 in the mandible. Of the 103 inserted, 87 were immediately loaded and 16 submerged in the usual fashion. All 16 submerged implants were found to be integrated at the 2nd stage surgery. Two (2) of the immediately loaded implants were found to be not integrated at the time of 2nd stage surgery. One (1) implant subsequently failed 18 months after implant insertion. To date, in the life table analysis of 4 1/2 years, a total of 3 implants have failed.

Immediately Loaded in Extraction Sites				
Patient	Number inserted	Number in extraction sites	# Immed. loaded in extraction sites	Number failed in extraction sites
D.K. MAX	10	3	2	0
B.S. MAX	10	0	7	1
E.H. MAX	11	2	2	0
J.M. MAX	10	0	0	0
L.K. MAX	4	1	1	0
B.S. MAND	10	5	5	0
P.A. MAND	6	0	0	0
M.M. MAND	6	5	5	0
T.W. MAND	6	0	0	0
N.A. MAND	6	3	3	0
E.H. MAND	6	4	4	0
S.G. MAND	10	5	3	0
TOTAL	103	37	32	1

Immediately Loaded in all Sites				
Patient	Number inserted	Total number inserted	Number loaded	Number failed
D.K. MAX	10	10	3	1
B.S. MAX	10	7	3	1
E.H. MAX	11	7	4	1
J.M. MAX	10	0	0	0
B.K. MAX	8	0	0	0
L.S. MAND	4	4	0	0
M.M. MAND	6	6	0	0
E.H. MAND	6	6	0	0
D.D. MAND	10	7	3	0
P.A. MAND	6	0	0	0
B.W. MAND	6	0	0	0
N.A. MAND	6	0	0	0
TOTAL	103	87	16	3

Summary Table		
MAXILLA		
# Immed. loaded	# Failed	Success
39%	3%	92.3%
MANDIBLE		
# Immed. loaded	# Failed	Success
48%	0%	100%

Summary Table	
Number of implants in extraction sites	37
Number of implants immediately loaded in extraction sites	32
Number of implants failed in extraction sites	1

Summary Table	
Implants inserted	103
Implants immediately loaded	87
Immediately loaded implant failures	3
% Success of immediately loaded implants	96.55%
Number of implants in extraction sites (immed. loaded)	32
Number of failures in extraction sites (immed. loaded)	1
Number of buried implants	16
Number of buried implant failures	0
% Success of all implants inserted	97.1%

Conclusion

1. Using the Aires/Berger protocol a clinically acceptable success rate can be achieved for immediate loading in both extraction sites and healed sites.
2. Further study and analysis is necessary to assess whether implants that are not clinically stable can be immediately loaded in a cross-arch prosthesis with multiple implants.

References

1. Schitlman PA, Wehrle PS, Rubenstein JE. Immediate fixed interim prostheses supported by two-stage threaded implants: Methodology and results. J Oral Implantol. 1990;16:96-105.
2. Henry P, Rosenberg I. Single-stage surgery for rehabilitation of the mandible: Preliminary results. Prost Prostodontics Acadent Dent. 1994;6:15-22.
3. Tarnow DP, Grimaldi S, Classi A. Immediate loading of threaded implants at stage 1, surgery in edentulous arches: Ten consecutive case reports with 1 to 5 year data. Int J Oral Maxillofac Implants. 1997;12:319-324.



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