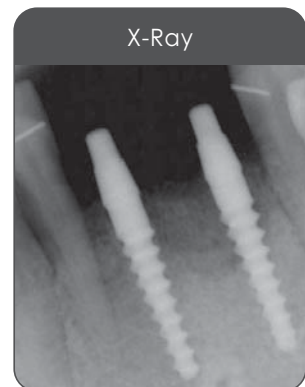
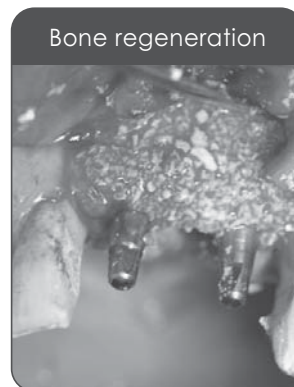


Immediate Implantation, Immediate Loading and Guided Bone Regeneration is it Possible?

Dr. Schneider Gadi - D.M.D, Specialist in Periodontics



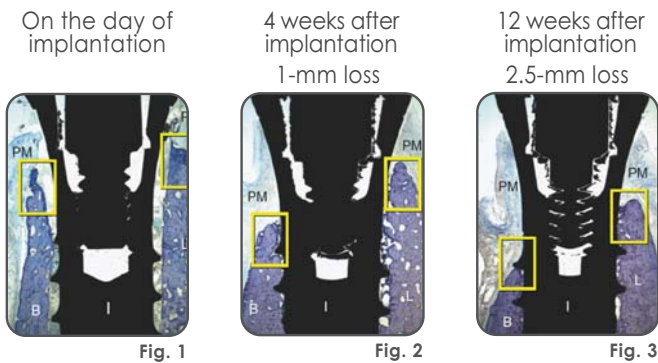
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Immediate implantation:

- Clinical studies conducted on animals demonstrated from histological point of view that immediate implants inserted into fresh extraction sockets achieved a high osseointegration level (Barzilay et al. 1990, Nail et al. 1990).
- The success rate of immediate implantation is high, namely between 93.3% and 97.7% (Becker 1998, Schwartz-Arad & Chaushu 1997, Watzek 1995, Becker & Becker 1995, Yukna 2003).
- The results are predictable and yield a very high level of osseointegration.
- It is now known that even in cases of immediate implantation, there is buccal plate resorption (Araujo 2005, 2006).



Three parameters affected the degree of the buccal bone resorption:

- The bone width - in the molar region where the buccal plate is very thick, there was significantly less resorption.
- The space between the implant and the buccal plate - the greater the space, the less resorption.
- The use of bone substitutes and/or membranes - the use of bovine bone mineral, which is absorbed slowly, significantly reduced buccal plate resorption (Cardaropoli 2005).

Immediate loading - literature review

- Bleeding indices, plaque indices, pocket depth, crestal bone resorption and success rates are similar in delayed and in immediate loading (Ericsson 2000, Ostman 2005, Chiapasco 2001).
- Edentulous maxilla - implant survival rate of 92.2% to 100% (Ostman 2005, Ibanez 2005, Jaffin 2005, Van Steenberghe 2004, 2005).
- Edentulous mandible - implant survival rate of 96.6% to 100% (Chiapasco 2003, Degidi 2005, Testori 2004, Van Steenberghe 2004).

- Short-term histological assessment of immediate loading:
 - Primary stability of implant.
 - There is no difference in BIC between delayed and immediate loading.
 - The bone around the implant is mature and shows signs of remodeling (Romenos 2001, Sharawy 2000, Testori 2001, Piatelli 1997).
- Long-term histological assessment of immediate loading:
 - There is no difference in BIC between delayed and immediately loaded implants.
 - In immediately loaded implants, there is less bone marrow space and more compact bone.
 - After 9 months the BIC in immediately loaded implants is greater as compared to delayed loaded implants.
 - After 15 months the BIC in immediately loaded implants is twice as high as compared to delayed loaded implants (Piatelli 1993, 1997, 1998, Randow 1999, Ledermann 1998).

Guided bone regeneration:

Conditions for guided bone regeneration combined with implant insertion:

- Primary stability of the implant.
- Ideal implant position from the rehabilitation point of view.
- The size and shape of the bone defect must make it possible to insert the implant and achieve primary stability.

Conditions for the success of guided bone regeneration according to the Buser protocol (1995):

- Proper planning of the incision and the flap so as to enable primary closure of the flap.
- Ideal implant positioning.
- Bone decortication in order to enable the osteoprogenitor cells to reach the area and promote bone growth.
- Creating and maintaining a defined space beneath the membrane in order to prevent the membrane from collapsing into the space.
- Close adaptation of the membrane to the bone in order to prevent soft tissue cell penetration (preferably with membrane fixing screws or absorbable sutures).

- Primary closure of the flap with periosteal releasing incisions and double layer suturing.
- A waiting period of at least 6 months before the flap is opened.

Immediate loading and bone augmentation - is it feasible?

- Guided bone regeneration requires the use of a membrane in order to achieve optimal results (Zitzmann 1997, 2001, Hurzeler 1998, Hockers 1999).
- Primary closure of the tissue is not a necessary condition for successful guided bone regeneration (Hammerle 1998, 2001).
- It is possible to perform immediate loading combined with GBR - 86%-94% bone fill of defects that were treated with GBR around transmucosal implants (Hammerle 98, 01).
- Complete bone fill in 20 out of 21 defects treated with GBR around transmucosal implants (Lang 94).
- Immediate loading can be combined with augmentation despite the fact that the literature proves that the most predictable way of performing guided bone regeneration is through the proper and ideal use of soft tissue and complete primary closure of the tissue.

- Immediate loading combined with augmentation is a very complex procedure which greatly increases the risk of complications. On the other hand, the procedure makes it possible to:

- Significantly shorten the treatment duration;
- Reduce the number of surgical procedures;
- Avoid the need for a removable temporary denture which has a detrimental effect on bone augmentation.

In summary:

The combination of immediate loading and simultaneous bone augmentation is possible but is very difficult to implement and is not conducive to achieving optimal results.

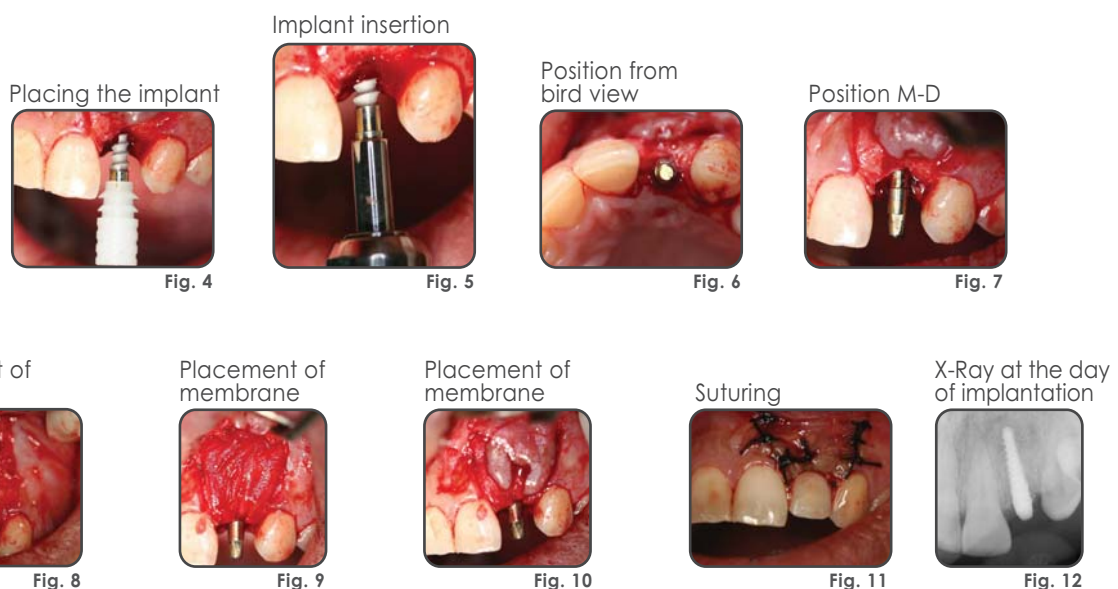
In cases where immediate loading is planned for narrow ridges requiring bone augmentation (in the case of standard implants), the case must be carefully planned and the advantages weighed against the drawbacks.

In cases where extensive bone augmentation is required and initial stability is hard to achieve, immediate loading will clearly not be performed. In cases where all the implants are long enough, stable enough and minimal bone augmentation is required immediate loading can be performed with predictable results.

Data on file.

Case 1 - Implantation, Guided Bone Regeneration and Immediate Loading of a Single Tooth in Area 12

Dr. Schneider Gadi and Dr. Bruckmayer Yoram



Turn page for more cases.

Case 2 - Immediate Implantation, Bone Regeneration and Immediate Loading of Area 32-41

Dr. Schneider Gadi and Dr. Bruckmayer Yoram

Before extractions



Fig. 13

After extractions



Fig. 14

Placing guide pins



Fig. 15

Guide pins



Fig. 16

Placing the implant

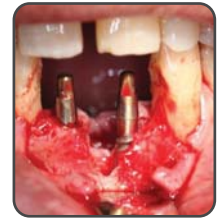


Fig. 17

Placement of bone



Fig. 18

Placement of membrane



Fig. 19

Suturing



Fig. 20

Periapical x-ray

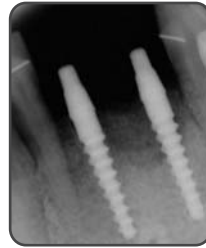


Fig. 21

Temporary restoration



Fig. 22

Case 3 - Immediate Implantation, Closed Sinus Elevation, Guided Bone Regeneration and Immediate Loading of the Maxilla

Dr. Schneider Gadi and Dr. Bruckmayer Yoram

CT-based case planning:

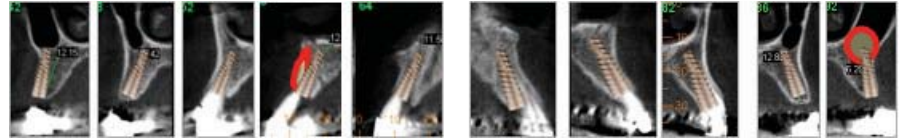


Fig. 23

Initial status on the day of surgery



Fig. 24

Parallelism test



Fig. 25

Closed sinus elevation



Fig. 26

Exposure of threads

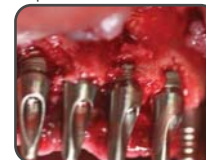


Fig. 27

Bone and resorbable membrane



Fig. 28

Sutures



Fig. 29

Immediate loading of temporary bridge



Fig. 30

Panoramic X-ray 6 months post-op



Fig. 31