# Immediate Implant Placement and Loading in the Anterior Maxilla

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# Proceedings of the third ITI consensus conference, Gstaad, August 2003

**Implants in Extraction Sockets**

Short-term survival rates and clinical outcomes of immediate and delayed implants were similar and were comparable to those of implants placed in healed alveolar ridges.

There is evidence to suggest that the survival rate for implants placed immediately following extraction of teeth associated with local pathology is similar to that of implants placed into healed ridges.

Peri-implant horizontal defects of 2mm or less associated with immediate implants have spontaneous bone regeneration. Bone integration will take place if rough surfaces are used.

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## Aesthetics in implant dentistry

With anterior single tooth replacement in sites without tissue deficiencies, predictable treatment outcomes, including aesthetics, can be achieved because of tissue support provided by adjacent teeth.

When treating patients with a thin, scalloped gingival biotype, even with an intact buccal plate, concomitant augmentation is recommended to prevent resorbtion of the buccal plate as well as soft tissue recession.

In cases with thicker, less scalloped gingival biotype with an intact buccal plate, the need for concomitant augmentation at the time of implant placement may be reduced.

In general, the case reports and studies indicate that once immediately loaded implants integrate, they appear to have longitudinal bone loss and soft tissue stability comparable to those of conventionally loaded implants.

Limited data suggest that immediate restoration of implants in the aesthetic zone might facilitate and stabilize gingival architecture more than a staged approach.

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**Classification for implants placed in extraction sockets:**

Type 1 Implant placement immediately following tooth extraction and as part of the same surgical procedure

Type 2 Complete soft tissue coverage of the socket after 4-8 weeks

Type 3 Substantial clinical and/or radiographic bone fill of the socket after 12-16 weeks

Type 4 Healed site, after more than 16 weeks

# Immediate Implant Placement and Immediate Loading in the Anterior Maxilla

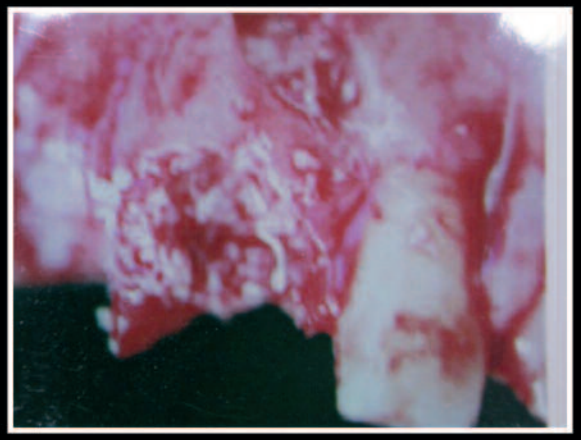
## Advantages

- Patient demand for a fixed restoration
- Shorter treatment time, but longer chairside!
- Reduced number of surgical procedures
- Optimal availability of existing bone
- Less need for augmentation technic
- Controlled soft tissue management
- Papilla are maintained
- Ideal implant positioning
- CT scan and surgical guide not necessary
- Reduced risk of anatomical injuries

## Disadvantages

- Thin tissue biotype
- Buccal plate defect
- Increased chairtime
- Procedure is technique-sensitive
- Need for an important stock of implants and abutments
- High level of experience required

# Case 1: Immediate extraction using simultaneous bone augmentation with a standard ITI implant


A 14 year old boy presented with a failing root canal after a soccer accident.
Extraction and simultaneous bone augmentation, using BioOss and a resorbable membrane, were performed.
Two standard ITI implants were placed using a type 1 surgical approach.

# Case 1: Immediate extraction using simultaneous bone augmentation with a standard ITI implant

A 4-month healing period was allowed, the patient wore a removable temporary prosthesis.
Excellent soft tissue response, nice thickness of the labial gingiva, but absence of any papillae.
Try-in of Procera Alumni caps.

# Case 1: Immediate extraction using simultaneous bone augmentation with a standard ITI implant

Final Procera crowns cemented with a glass ionomer cement 6 months after implant placement.
Final restoration 5 years after implant placement, the patient being now 17 years old. Note the ‘elongated’ lateral incisors due to the patient maxillary growth, as well as the scalloped papillae.

# Case 1: Immediate extraction using simultaneous bone augmentation with a standard ITI implant:

Final restoration

# Case 2: Central incisor replaced with a Replace tapered implant immediately after extraction



24 year old female patient presented with a sinus tract 6 months after periapical surgery.
The periapical radiograph showed a large amalgam retrofill as well as periapical pathology.
Careful extraction without damage to the surrounding structures.

# Case 2: Central incisor replaced with a Replace tapered implant immediately after extraction

Implant placement after extraction, curettage of the site, and immediate healing cap positioned in order to prevent soft tissue collapse.
After acrylic temporary fabrication using an alginate impression, the temporary was locked to the adjacent teeth.
4 weeks after implant placement, note the nice soft tissue response and the thickness of the labial gingiva which is crucial in the long term preservation of aesthetics.

# Case 2: Central incisor replaced with a Replace tapered implant immediately after extraction

Procera abutment placement and torkening to 35 Nm.

Try-in of the ceramic biscuit which is too bulky in all dimensions

# Case 2: Central incisor replaced with a Replace tapered implant immediately after extraction

Before

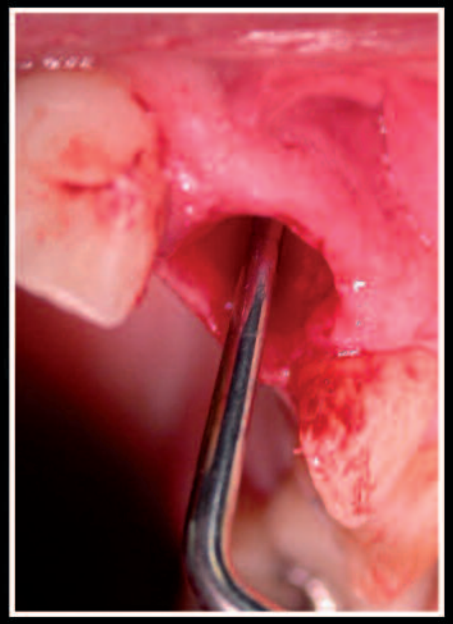
After

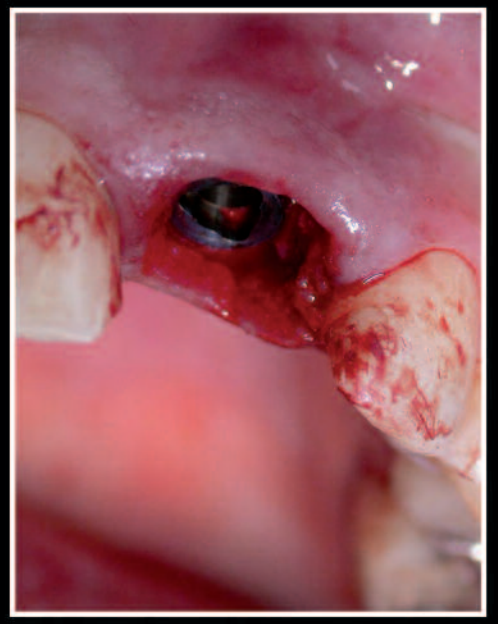
Final Procera abutment and crown placed only 6 weeks after extraction and immediate implantation. Note the excellent soft tissue response and papillae conservation.

# Case 3: Central incisor replaced with a Replace tapered implant immediately after extraction

34 year-old female patient referred with a gingival inflammation and a loose crown.
The periapical radiograph revealed a fractured crown and periapical pathology.
Extraction of the fractured tooth root. The buccal plate remained intact.

# Case 3: Central incisor replaced with a Replace tapered implant immediately after extraction





Careful curettage of the extraction socket, verification that there is no bone perforation greater than 2-3mm and localization of the coronal position of the buccal bone.
Implant placement at the level of the buccal boney crest. The implant diameter at the CEJ junction should never be larger than the extracted tooth at the same level! If the gap between the bone and implant is wider than 2 mm, the adding of bone filling material may be considered.

# Case 3: Central incisor replaced with a Replace tapered implant immediately after extraction



The implant had a primary stability of at least 50 Nm and  a permanent abutment with a 0.5 mm shoulder was used in order to fabricate a provisional. However, it is recommended that an abutment with a 3mm shoulder height be used to keep the temporary crown shoulder above tissue level.
A  thermoformed shell and any self-curing material or composite can be used to fabricate the temporary crown.

# Case 3: Central incisor replaced with a Replace tapered implant immediately after extraction

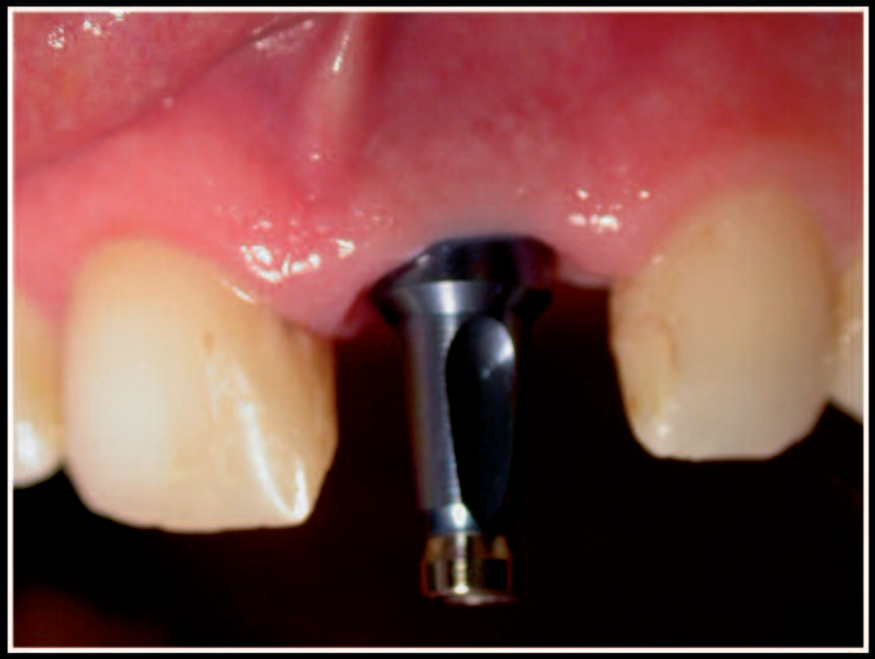
In order to give a final form and polish to the temporary, it is recommended that the abutment be removed and replaced on an implant analog. To prevent soft tissue collapse, a healing abutment with chlorhexidine gel was immediately placed on the implant.
It is crucial to use an accurate polishing sequence to achieve ideal contours of the temporary and thus allow healing of the insured soft tissues. Note the 45 degree emergence angle of the crown neck.

# Case 3: Central incisor replaced with a Replace tapered implant immediately after extraction

Before repositioning the abutment and crown on the implant, chlorhexidine gel was applied to the surgical site. No more than 10 Nm were used to fix the abutment!

The temporary crown is seated with some temporary cement if the shoulder level is visible. However, if the shoulder level is sub-gingival, no cement is used, but rather prosthesis adhesive.

# Case 3: Central incisor replaced with a Replace tapered implant immediately after extraction



Final impression using a closed tray transfer.

Impression coping repositioned in order to verify the correct implant placement.

# Case 3: Central incisor replaced with a Replace tapered implant immediately after extraction

Titanium abutment

Zirconia abutment

# Case 3: Central incisor replaced with a Replace tapered implant immediately after extraction

Biscuit

Final Glaze

# Case 3: Central incisor replaced with a Replace tapered implant immediately after extraction

Before

Rx

After

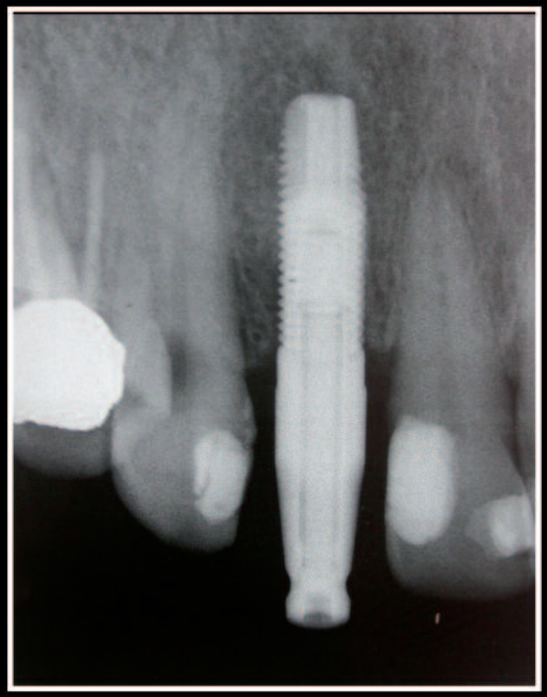
Marginal inflammation around the natural teeth, whereas the implant site shows no sign of inflammation. The 12-month follow-up Rx shows marginal bone loss.

# Case 4: Lateral incisor replaced with a Replace tapered implant immediately after extraction

This 78 year old patient lost her tooth due to a root perforation.
Extraction and immediate implant placement were performed. Since the implant had limited primary stability and papillae were absent, no immediate loading was done.

# Case 4: Lateral incisor replaced with a Replace tapered implant immediately after extraction

Impression using a closed tray transfer



Rx verifying correct seating of the transfer.

# Case 4: Lateral incisor replaced with a Replace tapered implant immediately after extraction

Zirconia abutment

Biscuit try-in

# Case 4: Lateral incisor replaced with a Replace tapered implant immediately after extraction

Before

After

# Case 5: Lateral incisor replaced with a Replace tapered implant immediately after extraction



Because of the coronal fracture, this crown had been splinted for years to the adjacent teeth.
The surrounding soft tissue showed severe inflammation, but the root was easily extracted.

# Case 5: Lateral incisor replaced with a Replace tapered implant immediately after extraction



Immediate abutment placement after the implantation. An abutment shoulder of 3mm height was used to keep the provisional margin above the implant site. Provisional fabrication using a preformed thermoshell and a conventional resin.

# Case 5: Lateral incisor replaced with a Replace tapered implant immediately after extraction



Implant site 6 weeks after surgery.
The provisional crown using a prefabricated aesthetic abutment showed excellent healing after 6 weeks.

# Case 5: Lateral incisor replaced with a Replace tapered implant immediately after extraction

Abutment try-in

Biscuit try-in

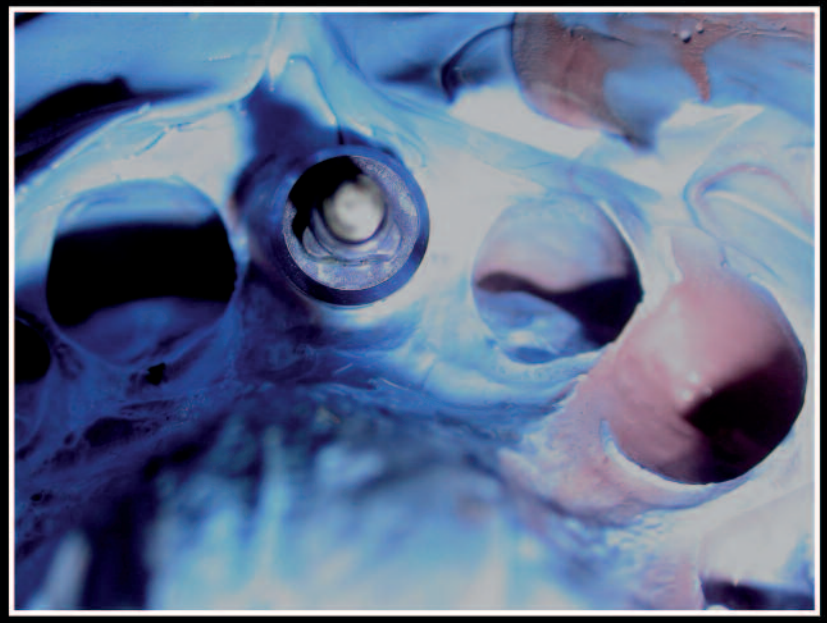
# Case 6: Central incisor replaced with a Replace tapered implant immediately after extraction

Tooth loss in an 18-year old patient after a failing root canal and periapical treatment. The patient insisted on maintaining her diastema.

# Case 6: Central incisor replaced with a Replace tapered implant immediately after extraction

Implant placement and immediate loading. An 3mm shoulder abutment was used, but the provisional crown was slightly over-contoured.

# Case 6: Central incisor replaced with a Replace tapered implant immediately after extraction



Impression using a closed tray transfer after a 6-week healing period.
Immediate repositioning of the transfer in order to verify the stability and correct position of the implant.

# Case 6: Central incisor replaced with a Replace tapered implant immediately after extraction

Abutment and final crown placement. Distal and mesial papillae are still compressed from the over-contoured provisional.

# Case 6: Central incisor replaced with a Replace tapered implant immediately after extraction

Before

After

After

# Case 7: Lateral incisor replaced with a Replace tapered implant immediately after extraction



Patient presented with a fractured tooth root.
The root was extracted and an the implant immediately loaded with a provisional crown.

# Case 7: Lateral incisor replaced with a Replace tapered implant immediately after extraction

Before

After

# Case 8: Lateral incisor replaced with a 3i natural tapered implant immediately after extraction

This patient presented with a coronal fracture and periapical pathology.
Careful extraction of the root allowed an immediate implant placement.

# Case 8: Lateral incisor replaced with a 3i natural tapered implant immediately after extraction

After extraction, a 1.8 mm bur was used to drill to the final implant length.
The primary stability was obtained at the apical end of the implant.
A second (pink) bur and a third ( blue) bur were used to obtain the
correct site preparation.
Use of a sample implant in order to verify the accuracy of the future implant site.

# Case 8: Lateral incisor replaced with a 3i natural tapered implant immediately after extraction

Front and coronal view of the healing abutment.

# Case 8: Lateral incisor replaced with a 3i natural tapered implant immediately after extraction



The provisional was left in place for 6 weeks and showed considerable staining due to the use of a chlorhexidine gel.
The removal of the provisional and healing abutment showed nice soft tissue healing.
A closed tray transfer was used to take the final impression.

# Case 8: Lateral incisor replaced with a 3i natural tapered implant immediately after extraction

Before

After

# Case 9: Central incisor replaced with a Replace implant 6 years after extraction

This 16-year old patient lost his central incisor at the age of 16 following a traumatic cyst.
Extraction was performed, a 2cm lesion removed, filled with BioOss and covered with a resorbable membrane.
The patient wore a ‘flipper’ prosthesis for 6 years.

# Case 9: Central incisor replaced with a Replace implant 6 years after the extraction



A small incision was made and a 4.3 mm implant placed using ostotomes.
A 3mm shoulder height abutment was used to support the provisional.
The provisional was fabricated with composite, reshaped and polished intraorally.

# Case 9: Central incisor replaced with a Replace implant 6 years after the extraction

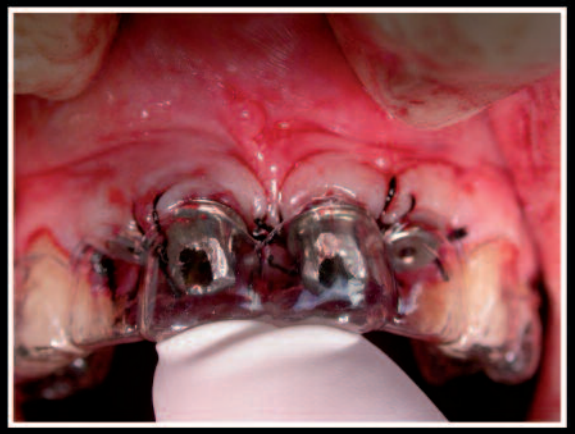
Final impression was performed 2 months after implant placement using a closed tray transfer.

# Case 9: Central incisor replaced with a Replace implant 6 years after the extraction

Abutment try-in and final crown placement 1 year after the implant placement. The contact point is too flat and there is marginal inflammation due to poor oral hygiene.
In addition, the gingival contour could have been changed slightly at the time of impression, but the patient refused any further intervention.
From a professional point of view, therefore, this case could be improved and shows that the type1 procedure will not always yield an immediate, perfect outcome.

# Case 10: Placement of 4 Replace implants following the loss of 4 central incisors



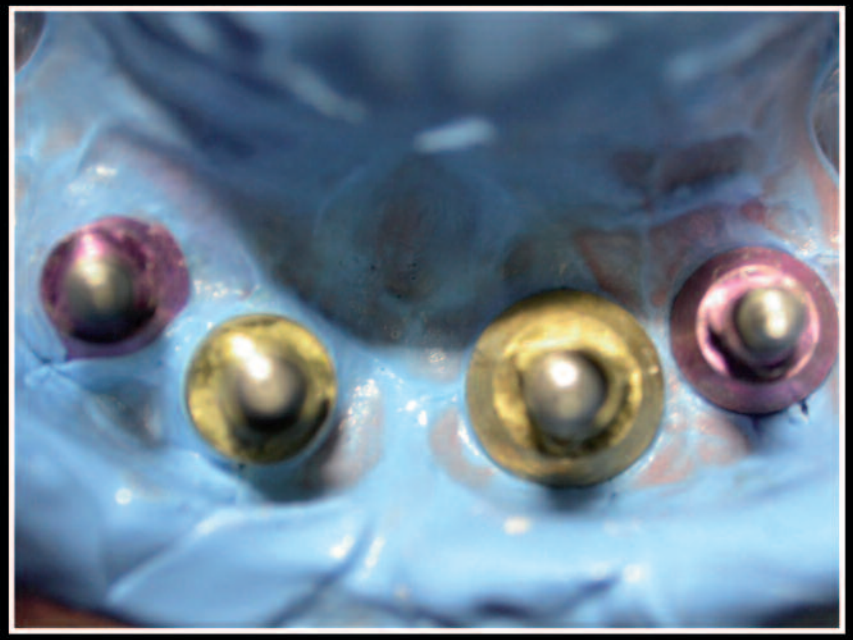


All 4 incisors were extracted following root fractures and failing endodontic retrofills.

Implants were slightly placed in a palatal position, and BioOss and a membrane used to build up the ridge.

Since the primary stability was excellent, a fixed provisional was done.

# Case 10: Placement of 4 Replace implants following the loss of 4 central incisors



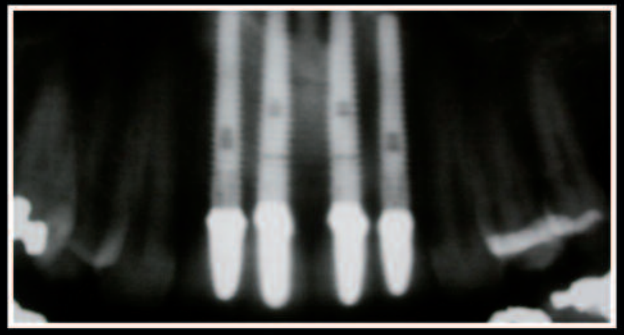
A final impression was obtained using closed tray impression transfers.

# Case 10: Placement of 4 Replace implants following the loss of 4 central incisors

Zirconia abutment try-in

Procera biscuit  try-in

# Case 10: Placement of 4 Replace implants following the loss of 4 central incisors



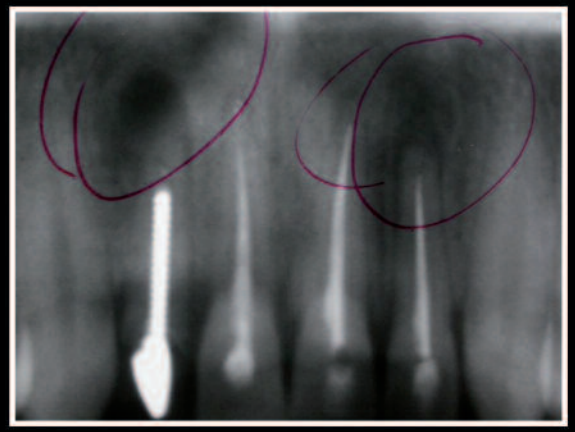
Final case

# Case 10: Placement of 4 Replace implants following the loss of 4 central incisors

Before

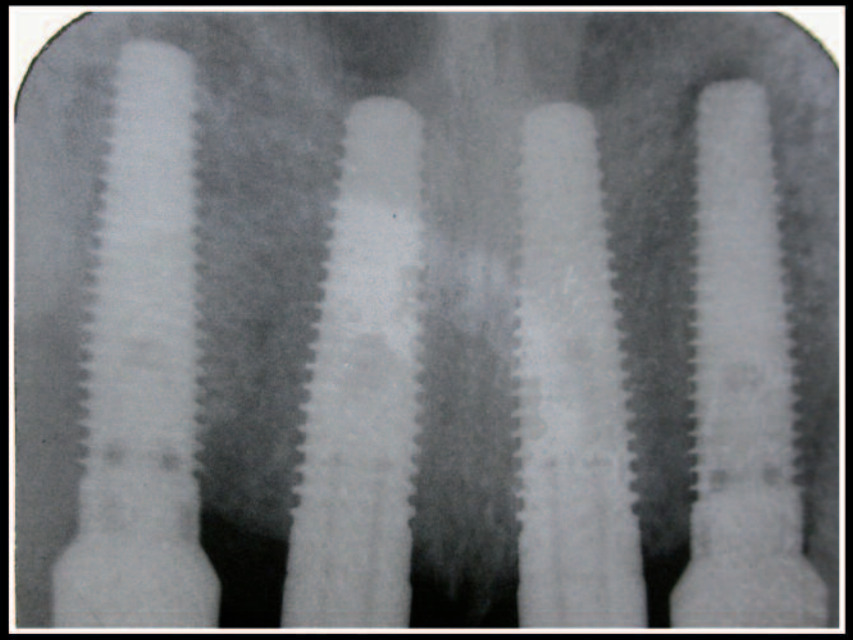
After

# Case 11: Delayed placement of 4 Replace implants following the loss of 4 central incisors



This patient lost her incisors following a sports accident. Two periapical curettages were performed, but her infection persisted.
It was decided to extract all incisors at the age of 16, perform an aggressive curettage, fill the defects with BioOss, and cover the site with a membrane.
7 years later, the patient presented with the above ridge and requested the replacement of her partial denture with a fixed implant supported bridge.

# Case 11: Delayed placement of 4 Replace implants following the loss of 4 central incisors



We were able to place 4.3 mm implants using an ostetomy technique.

# Case 11: Delayed placement of 4 Replace implants following the loss of 4 central incisors



Healing abutments were used to support the temporary thermoformed provisional. At first, a provisional without pink resin was made, but due to the high smile line, it has to be relined with pink resin.

# Case 11: Delayed placement of 4 Replace implants following the loss of 4 central incisors

Final impression using closed tray transfers and immediate repositioning.

# Case 11: Delayed placement of 4 Replace implants following the loss of 4 central incisors

Exposed implants

Titanium abutment try-in

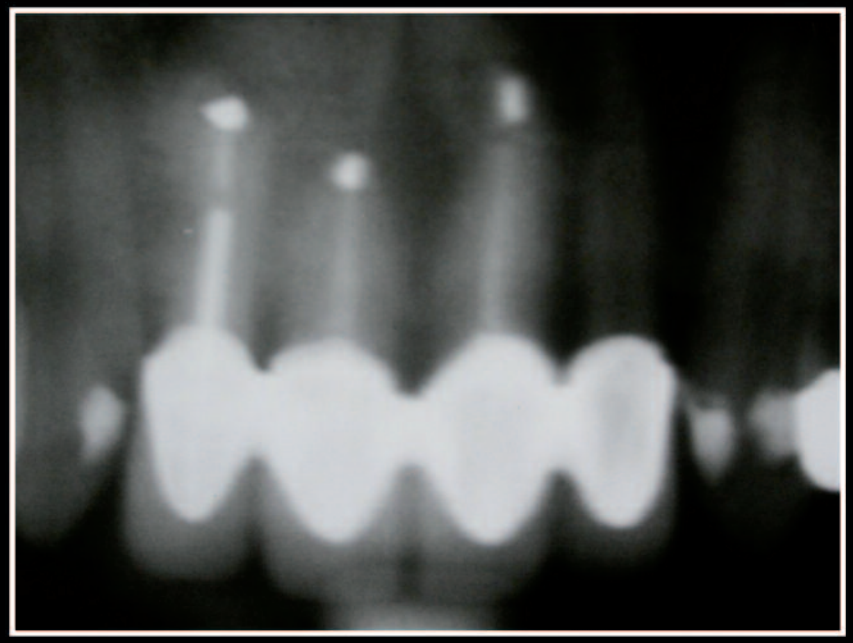
Pattern resin try-in

# Case 11: Delayed placement of 4 Replace implants following the loss of 4 central incisors

Biscuit crown finish

Final crowns

# Case 12: Placement of 4 Replace implants following the loss of 4 central incisors



Failing classic and periapical endodontic treatment with consequent extractions of all incisors.

# Case 12: Placement of 4 Replace implants following the loss of 4 central incisors



Atraumatic extraction and the intact buccal crest allowed the immediate placement of 4 implants, which had excellent primary stability.
We used 3mm shoulder abutments to build a fixed temporary bridge.

# Case 12: Placement of 4 Replace implants following the loss of 4 central incisors

Abutment try-in

Procera cap try-in

# Case 12: Placement of 4 Replace implants following the loss of 4 central incisors

Procera Try-in

Final case at day 0

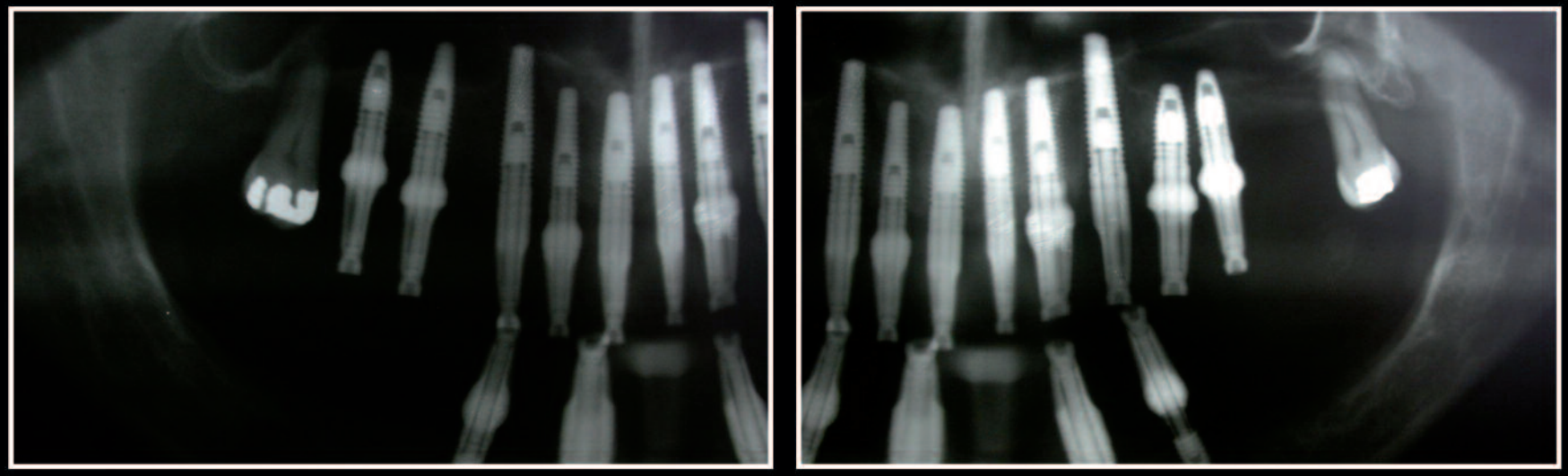
Final case 2 years later

# Case 13: Placement of 10 Replace implants because of terminal periodontal disease



This patient had had periodontal surgery 3 times over the past 10 years. All her teeth were mobile and she could no longer eat without discomfort.
She insisted on having single crowns for aesthetic reasons and because she wanted to use dental floss. She also requested a provisional which would not inhibit her phonetics and which would not stimulate her excessive gag reflex.
All teeth were extracted and a fixed provisional using temporary abutments was fitted.
The above view shows the patient 2 days after surgery. The patient was instructed to brush her teeth and also to use a mouth jet.

# Case 13: Placement of 10 Replace implants because of terminal periodontal disease



# Case 13: Placement of 10 Replace implants because of terminal periodontal disease

Abutment try-in

# Case 13: Placement of 10 Replace implants because of terminal periodontal disease

Pattern resin relation in order to verify all contacts

# Case 13: Placement of 10 replace implant because of terminal periodontal disease

Procera try-in

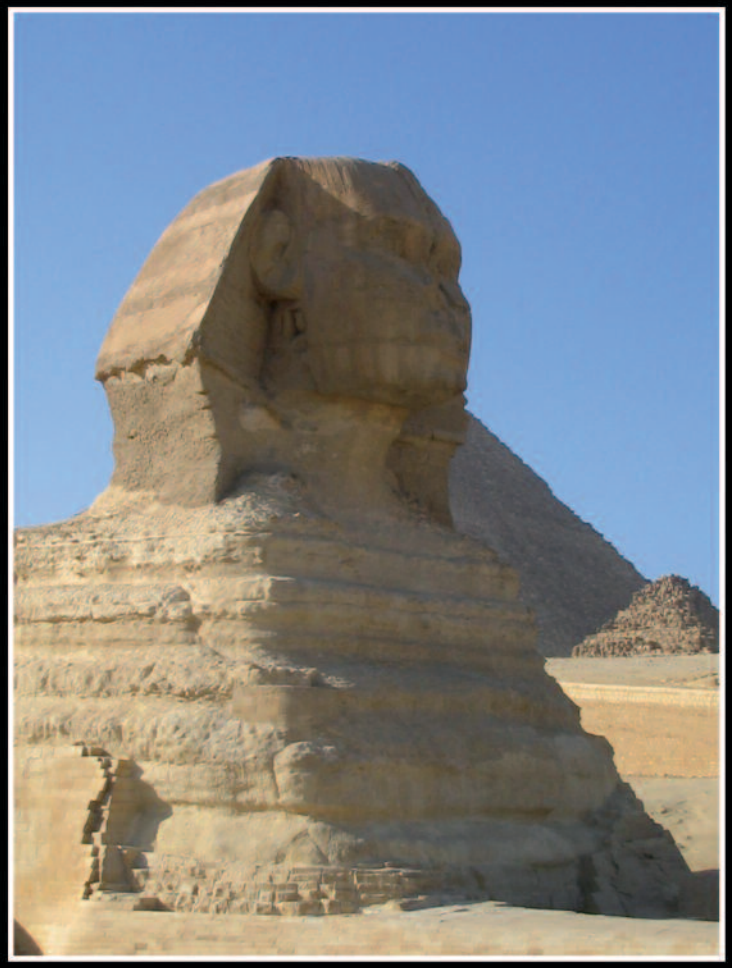
# Aesthetics is an illusion rather than reality

## With thanks

I would like to thank my dental technicians, especially Rainer Scherer and Andreas Hrumbrecht, without whose commitment and hard work success in the following cases would not have been possible.

Their contribution to these fascinating cases has helped to change an illusion of aesthetic beauty into reality.

A special recognition to Anne-Marie Gendron and Ken MacKensie for the final lay-out.



Impression: Bachmann Impression, Crans-Montana