

Hybrid Prosthesis, Tilted Implants, Angled Abutments and RevitaliZe Solutions

Why do patients go to a dentist?

- Dental problems that need treatment
- They want it now
- No body wants surgery
- They want predictable solutions
- It should be scientifically based

CT Scan: It provide valuable information.

- HOWEVER it does not replace a diagnostic cast and wax-up

Hybrid Prosthesis: “A denture tooth and acrylic design with a milled bar or cast metal substructure”.

- Fixed Detachable Prosthesis (Hybrid Denture)
- 4-6 implants are placed in the interforaminal region (Mandible)
- Removable by the dentist but not by the patient (screw retained)
- Exhibits distal extensions (resulting in cantilever)
- Implant supported restoration with occlusion to 1st molar

Advantages:

- Excellent stability and function
- Provides patient psychological support

Disadvantages:

- Difficult oral hygiene
- May not provide facial tissue support
- Cantilever stress due to distal extensions

Esthetics:

- Classic design was high off tissue due to limited components
- Modern design is esthetic and conforms to tissue

Profile Prosthesis replaces teeth and tissue: *The Profile Prosthesis*; Schnitman P., Practical Periodontal Aesthetic Dentistry;11;143-151,1999

Maxillary Hybrid Prosthesis:

- More difficult than mandible
- Unrealistic expectations
- Hygiene can be difficult
- Esthetics may be difficult
- Phonetics can be a problem
- May not provide lip support
- May require excess acrylic

Treatment Planning and Case Design:

- Bone Preservation
- Function
- Expense

Why use a Hybrid (Profile) Prosthesis

Criteria for selecting PFM or Hybrid Prosthesis

<u>Porcelain Fused to Metal</u>	<u>Hybrid Prosthesis</u>
• √ cost more	cost less
• √ vertical dim < 15mm	vertical dim >15
• √ technique same	technique same
• √ esthetics same	esthetics same
• √ appointments more	appointments less
• √ soft tissue recon difficult	soft tissue recon easy
• √ repair very difficult	repair easy
• √ arch length varies	arch length 1 st molar

Source: Dental Implant Prosthodontics, Dr. Carl Misch 2005

Fixed-Prosthetic implant Restorations of the Edentulous maxilla:
A Systematic Pretreatment Evaluation Method: Edmond Bedrossian,
et.al. J Oral Maxillofacial Surgery; 66;112-122,2008

Excellent Reference For Prosthetic Concepts

Prosthetic Concepts for the edentulous arch:

- √ Metal Ceramic Restoration
- √ Fixed Hybrid Restoration
- √ Removable Overdenture

Key Determinates for successful treatment of the completely edentulous arch.

- Presence or absence of composite defect
- Visibility of edentulous ridge without the denture in place
- Amount of bone loss

√ PFM restoration required

- no bone or soft tissue defect
- only replacing clinical crown

√ Composite Defect: Missing teeth, soft tissue and bone

- Profile Prosthesis
- Bar Overdenture

A-P Spread: The distance from the center of the most anterior implant to a line joining the distal aspect of the two most distal implants. This provides an indication for the amount of cantilever that can be planned.

With 5 implants it should not exceed 2.5 times the A-P spread if all stress factors are low.

Dental Implant Prosthodontics; Carl E. Misch; p. 168

“1.5 A-P Spread” English Rule; Charles E. English, DDS

Using 4 implants

Syllabus of Prosthetics for Osseointegrated Implants; Douglas Clepper, DMD; 1997 Omega Publications

Can we increase the AP Spread? Yes if implants are moved distal!

Problems with placing posterior implants to decrease cantilever:

√ Mandibular canal

√ Mental loop

√ Maxillary sinus

Things to consider for treatment planning:

- Available space
- Anatomy and anatomical structures
- Amount and quality of bone

How many implants do you really need??????????

Important considerations when treatment planning:

- √ Time: Patient wants it now
- √ Surgery: Nobody wants surgery
- √ Cost: Lower cost makes it available to more patients
- √ Success: Must be scientifically based

Treatment Goals:

- **Reduce treatment time**
- **Reduce the amount of needed surgery**
- **Control cost**
- **Have a high rate of success**

Can we change the A-P spread without surgery? YES

Use Tilted Implants

Reference text:

IMPLANT TREATMENT PLANNING FOR THE EDENTULOUS PATIENT

Dr. Edmond Bedrossian

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Reference Text

Why use tilted implants?

- can use longer implants to increase implant bone contact
- increase load distribution
- increase AP spread and reduce cantilevers in the prosthesis
- eliminate need for sinus lift
- reduce need for crestal bone grafts
 - *Reduce cost to patient

Tilted implants will provide for graftless surgery and Not necessarily flapless surgery.

Minimum maxillary bone: 5mm wide and 10mm high

Minimum mandibular bone: 5mm wide and 8mm high

Remember vertical space requirement!

- **15mm**
- **maximize AP Spread**

Tilting of dental Implants will increase length and result in better load distribution, increase anchorage and allow longer implants.

“Tilting of implants does not have a negative effect on load distribution when it is part of the prosthesis support.” (Dr. Edmond Bedrossian text)

How much increase?

√ Md 6.5mm (range 3-12mm)

√ Mx 9.3mm (range 5-15mm)

Reference: Bedrossian Text

Other Names for Procedure

- Zimmer RevitaliZe
- Nobel “all-on-4”
- Teeth is a day
- Immediate load

The above are recognized as “Graftless” surgery and not necessarily “Flapless” surgery.

***Minimum torque for implant stability for immediate load: 35 Ncm
Zimmer Tapered abutments are torqued to: 30 Ncm***

Load Transfer in Tilted Implants with Varing Cantilever Lengths in an All-On-Four Situation

Malhotra, AO. et.al; *Australian Dental Journal*. Dec 2012, vol.57 issue 4, pp. 440-445.

Conclusion: Study shows that increasing tilt of distal implants does not increase the stress significantly.

Bone Level Changes Around Axial and Tilted Implants in Full-Arch Fixed Restorations. Interim Results of a Prospective Study.

Francetti, Luca; et.al. *Clinical Implant Dentistry & Related Research*. Oct.2012, Vol. 14 Issue 5, pp 646-654.

Conclusion: The use of tilted implants in the immediate rehabilitation of the fully edentulous jaws is safe and is not associated with a higher marginal bone loss as compared to axially placed implants. (mean

follow-up time was 52.8 months in mandible and 33.8 months in maxilla)

√ Zones in the edentulous maxilla:

Zone 1: Premaxilla

Zone 2: Bicuspid

Zone 3: Molars

“All-on-Four” Immediate-Function Concept for Completely Edentulous Maxilla: A Clinical Report on the Medium (3 years) and Long-Term (5 years) Outcomes

Paulo Malo', DDS, PhD; et.al. *Clinical Implant Dentistry and Related Research*, Volume 14, Supplement 1, 2012.

Conclusion: The high survival rate at patient and implant level indicates that immediate-function concept for completely edentulous maxillae using the present protocol is viable in medium and long-term outcomes.

Immediate Implant Loading: Current Status From Available Literature

Avila, Galindo, Rios, Wang

Implant Dentistry 2007;16:235-245

Conclusion: “Immediate implant loading achieved similar success as the conventional approach”

Important Note: Requirements for success

- Careful case selection is required
- Proper treatment plan
- Meticulous surgery and properly designed prosthetics

**After surgical placement there is a “Dip” in retention between 2 and 4 weeks.

Survival Rate of Immediately vs Delayed Loaded Implants: Analysis of the Current Literature

Georgios Romanos, et.al. *Journal of Oral Implantology*;

Vol. XXXVI/No. 4/2010.a: “The parameter most often associated with the success of immediately loaded implants as reported in the literature was adequate implant stability of the implants”.

Clinic Protocol

Revitalize Solution:

Indirect technique for Zimmer Revitalize procedure.

1. Prepare case for surgery

- Select arch to be restored and confirm it is acceptable for a hybrid prosthesis
- If the patient has an existing denture that is clinically acceptable it will serve as the denture for the conversion. If the patient will have teeth removed set the case up as an immediate denture.
- Duplicate denture in clear acrylic to serve as a surgical guide.
- The patient is now ready for the procedure
- Record occlusal registration and make occlusal index.
- Follow surgical guidelines, place implants and abutments with healing caps as required.

2. Steps necessary for converting the denture.

- Relieve denture base so it will fit over healing caps.
- Place bite registration material in denture, seat in mouth, close to prerecorded vertical dimension and hold until bite material has set.
- Remove denture from mouth.
- Remove healing caps and place indirect transfers.
- Make an impression with polyvinyl or polyether material.
- Remove indirect transfers.
- Place tapered abutment replicas on indirect transfers and seat into impression.
- Pour impression in fast set dental stone (Snap Stone by Whipmix)
- When stone is set remove from impression.
- Place healing caps that were used for the bite registration on to the working cast.

3. Mounting the cast for converting the denture.

- Trim excess bite registration material from the denture to the level of the flanges.
- Confirm that denture with bite material inside will seat on the cast without any interference and index into the healing caps.

- Place the occlusal bite registration on the denture and seat on the occlusal surface of the opposing cast that is mounted on the articulator.
- Add mounting plaster to the articulator and cast to secure the cast.
- When mounting plaster has set, open articulator and remove denture.
- It is now ready to start denture conversion.

4. Converting the denture.

- While the bite material is still in the denture, drill through the bite material where the healing caps were recorded. Drill well into the acrylic.
- This will identify of the drill holes in the denture for the temporary titanium copings.
- Remove healing caps from the tapered abutment replicas in the cast.
- Attach titanium temporary copings to the replicas.
- Open the holes in the denture that were identified until adequate space is available to allow denture to freely fit over temporary copings on cast.
- Fit the denture into the index with the maxillary cast and confirm that it will fit without the temporary copings hitting the opposing cast.
- This will be confirmed by closing the articulator into the pre-set vertical dimension.
- If necessary reduce coping height.
- Place cotton into the access openings of the temporary copings and leave excess cotton sticking out. You will need to find this after acrylic has set by drilling into the acrylic addition.
- Lubricate cast only where acrylic will come into contact with the stone. Do not lubricate temporary copings.
- With a small brush apply acrylic power and liquid to the copings. The purpose is to assure that acrylic attaches to the grooves in the copings.
- Mix acrylic into a flowable consistency and place in denture.
- Place denture onto cast over copings and close articulator with the denture into the bite index on the opposing cast.

- VERY IMPORTANT: assure that denture is seated into index and that the articulator is closed.
- Maintain this position until acrylic is set.
- Open articulator and identify access openings for the screws.
- Use an acrylic bur of choice to remove acrylic over temporary coping access and remove cotton.
- Remove denture and add acrylic where necessary.
- Convert denture to a screw retained temporary bridge.
- Remember tissue side should be convex making it easy for the patient to clean.
- Do not extent cantilever in the provisional restoration beyond the most distal implant on each side.

5. Delivery of provisional.

- Deliver bridge to patient by attaching to tapered abutments.
- Torque screws to 20Ncm
- Adjust occlusion.
- Adjust occlusion to provide contact canine to canine in balanced occlusion.
- Occlusion posterior to the canines should be slightly out of contact.
- Cover access holes with easy to remove provisional material.
- Recall patient in one week and check occlusion, screws and tissue.
- After the one week check the provisional should not be removed for 8 weeks.
- Advise patient that it may take up to 6 months to accommodate to the new prosthesis.
- Error on the side of over closing the VDO at time of provisional placement.
- If patient is on a soft diet, broken acrylic and broken teeth usually occur as a result of occlusion. It may be necessary to make a hard night guard.
- In the final restoration the occlusion should stop at the first molar.
- Final restoration should have 1mm overjet and 1mm overbite in anterior.
- Final restoration should have group function and no balancing side occlusion

Possible Complications:

Fractures of acrylic teeth, body acrylic, screws or substructure

- * Excessive overload
- * Lack of passive fit
- * Parafunction
- * Lab errors or porosity
- * Inadequate restorative space
- * Excessive VDO

Soft tissue complications:

- * Tissue irritation under bar from rough surface or poor hygiene
- * Tissue and prosthesis relationship change resulting in speech problems or food collecting under prosthesis
- * Tissue overgrowth under prosthesis

Maintenance:

- * Soft tooth brush and mouth wash
- * Waterpik
- * Superfloss
- * Night guard
- * No hard food such as ice or hard candy

RECALL

- * Every 3 months 1st year
- * Evaluate and remove if necessary to clean
- * After 1st year recall based on patient assessment

Immediate Loaded Mandibular Fixed Implant Prostheses Using the All-On-Four Protocol: A Report of 183 Consecutively Treated Patients with 1 Year of Function in Definitive Prostheses. The International Journal of Oral & Maxillofacial Implants; Vol:27; No.3;2012; p. 628-633.

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Conclusion: Combination of axially placed and angled implants with the All-On-Four procedure can be successful in the mandible.

Factors for Success:

- Careful site selection.
- Preparation of osseous shelf to level ridge and provide space.

- Stable splinting of all four implants with immediate provisional.
 - Careful occlusal adjustment to provide bilateral occlusion in the canine and premolar region and no occlusion in the distal of the prosthesis.
 - Maximizing A-P spread
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