“THIS IS NOT YOUR FATHER’S IMPLANT DENTISTRY
BARRY R. FRANZEN, DDS

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WHAT THINGS DO YOU NEED TO CONSIDER WHEN CHOOSING AND IMPLANT

1. SURFACE TECHNOLOGY  
2. IMPLANT/ABUTMENT INTERFACE  
3. 5 YEAR LONGITUDINAL STUDIES OF BONE LOSS  
4. COMPANY SUPPORT

- Developed a mathematical model for estimation of the interfacial shear strength of a rough surface when the topographical characteristics of the surface are known.
- By means of the model, identify the topographical characteristics of a rough surface which can be expected to give a good interfacial shear strength.
THE IDEAL IMPLANT SURFACE

• INFLUENCED BY *PIT EFFECTIVITY FACTOR*

DEFINED AS THE SHEAR FORCE A BONE PLUG PROTRUDING INTO THE PIT CAN STAND BEFORE FRACTURE AND IS INFLUENCED BY THE SIZE AND SHAPE OF THE PIT

• INFLUENCED BY *PIT DENSITY FACTOR*

DEFINED AS THE NUMBER OF PITS PER UNIT SURFACE AREA OF THE IMPLANT AND IS INFLUENCED BY THE SHAPE OF THE PIT
HANSSON AND NORTON

Mathematically determined the optimal pit shape and geometry is a hemispherical pit of 1.5-3 microns in depth
And since that classic article we have advanced surfaces on the nanotechnological level

- A new generation of dental implants where the implant surface has a chemical modification
- Is a fluoride modified implant surface
MARGINAL BONE MATENANCE

0-0.26 MM BONE LOSS AT FIVE YEARS

Gotfredssen, K., and Holm, B. Implant supported mandibular overdentures retained with ball or bar attachments: Int J Prosthodontic 2000;13:125-130


COMPANY SUPPORT...

SAY YOU FORGOT TO ORDER SOMETHING

• IS YOUR SALES REP GOING TO FIND YOU ONE AND HAVE IT IN YOUR OPERATORY BEFORE THE PATIENT SITS DOWN?

• DOES HE/SHE HAVE A VESTED INTEREST IN THE SUCCESS OF YOUR PRACTICE AND THE OUTCOMES OF YOUR TREATMENT
WHAT IS THE COST OF SECONDARY CASE MANAGEMENT?

- DISCOVERY
- PLAN OF ACTION
- IMPLANT REMOVAL
- GRAFTING
- PROVISIONALIZATION
- NEW RADIOGRAPHS
- SURGICAL GUIDE
- COST OF MATERIALS, LAB FEES
- SECOND PROVISIONAL
- LOST OPPORTUNITY COST
### COST OF SECONDARY CASE MANAGEMENT

**EXAMPLE: SINGLE RESTORATION BASED ON NATIONAL AVERAGE OF $350/HOUR**

<table>
<thead>
<tr>
<th>INCIDENT</th>
<th>MATERIALS COST</th>
<th>TIME COST IN HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDENTIFY PROBLEM</td>
<td></td>
<td>0.5</td>
</tr>
<tr>
<td>REMOVE IMPLANT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BONE GRAFT</td>
<td>$145.00</td>
<td>0.75</td>
</tr>
<tr>
<td>MEMBRANE</td>
<td>$40.00</td>
<td></td>
</tr>
<tr>
<td>SUTURE</td>
<td>$15.00</td>
<td></td>
</tr>
<tr>
<td>POST OP FOLLOW UP</td>
<td></td>
<td>0.5</td>
</tr>
<tr>
<td>CBCT/ CONSULT</td>
<td></td>
<td>0.5</td>
</tr>
<tr>
<td>DIAGNOSTIC MODELS</td>
<td></td>
<td>0.5</td>
</tr>
<tr>
<td>SURGICAL GUIDE</td>
<td>$75.00</td>
<td></td>
</tr>
<tr>
<td>RE ENTRY</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>IMPLANT</td>
<td>$200.00</td>
<td></td>
</tr>
<tr>
<td>HEALING CAP</td>
<td>$40.00</td>
<td></td>
</tr>
<tr>
<td>SUTURE</td>
<td>$15.00</td>
<td></td>
</tr>
<tr>
<td>NEW RESTORATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IMPRESSION</td>
<td>$60.00</td>
<td>1</td>
</tr>
<tr>
<td>ABUTMENT AND CROWN</td>
<td>$500.00</td>
<td></td>
</tr>
</tbody>
</table>

| TOTAL COST OF RETREATMENT | $1,090.00   | $1,662.50   | $2,752.50  |
| LOST OPPORTUNITY COST    | $1,662.50   |            |            |

**OVERALL TOTAL COST**  
$4,415.00
Mrs. Smith, as you know, your situation is complex and will require proper planning in order to insure a successful and long lasting results. Right now I can envision 3 or 4 different options that are available to you to help you achieve the goals you desire and deserve. And I really want to make sure that I have looked at this from every angle before we even discuss those options.

I would like to do two things, if it is okay with you:
1. I would like to take all the information we have gathered today, sit down with it, (undisturbed) and formalize the options that are available to you.
2. Then I would like to invite you back to discuss those options in depth as to each option, the cost associated with it and the time it will take to complete.

Let’s go talk to Lavonne and find a time when we can get together and discuss this. Are you comfortable with that?
DEVELOPING YOUR PRACTICE PHILOSOPHY

• DO YOU HAVE A BOUTIQUE PRACTICE WITH COMMENSURATE CUSTOMER SERVICE RELATIVE TO QUALITY OF CARE AND HIGHER FEES

• DO YOU HAVE A MIDVOLUME PRACTICE NEEDING A CERTAIN NUMBER OF PATIENTS PER DAY WITHOUT CAUSING FATIGUE FOR THE TEAM AND OCCASIONAL HIGH-LEVEL PROCEDURES?

• IS YOUR PRACTICE DEDICATED TO A SOCIO-ECONOMIC POPULATION WHICH IS INSURANCE DEPENDENT THUS ALTERING TREATMENT OPTIONS AS PER INSURANCE ALLOWANCES?

• IF YOU HAVEN’T ARTICULATED OR DOCUMENTED THE PHILOSOPHY CAN YOU CHANGE TOWARDS GREATER PROFITABILITY AND
ASK YOURSELF SOME TOUGH QUESTIONS...

• HAVE YOU AND YOUR STAFF MADE TO DECISION TO QUARTERBACK THE PLAN OR ARE YOU A SPOON-FED VOUIRE LED BY THE SURGEON?

• HAVE YOU MADE THE COMMITMENT TO OWN THE APPROPRIATE ADJUNCTIVE MATERIALS OR DO YOU BORROW THEM?

• ARE YOU A PLAYER OR A DABBLER?
YOU MUST KNOW TO THE VERY PENNY WHAT YOU MUST PRODUCE PER HOUR IN YOUR OFFICE EACH AND EVERY
THIS DOLLAR PER HOUR INCLUDES

• YOUR SALARY
• YOUR PAYROLL EXPENSES
• RENT, ELECTRICITY, PHONE, POSTAGE
• YOUR RETIREMENT PLAN
• YOUR STAFF’S RETIREMENT PLAN
• LEASING EXPENSES, TAXES,
• LABORATORY COSTS
• SUPPLIES
• EVERYTHING!!!
NINE ESSENTIAL ELEMENTS TO IMPLANT PROFITABILITY

1. SYSTEMIZE YOUR ANALYSIS OF CASE COSTS

THREE AREAS OF CONCERN FOR THE RESTORATIVE DOCS

1. LAB COSTS
2. IMPLANT COMPONENT COSTS
3. OVERHEAD COSTS
2. ESTABLISH A TRUE INTERDISCIPLINARY TREATMENT PLANNING PROTOCOL WITH YOUR SURGEON

• HE/SHE DOESN’T HAVE TIME TO MEET WITH YOU? FIND ANOTHER SURGEON

• I PROMISE THE SURGEON WILL WELCOME YOUR LEAD

• MOUNTED DIAGNOSTIC CASTS, RADIOGRAPHS, SECOND SET OF CASTS FOR THE DIAGNOSTIC WAX UP

• THINGS DISCUSSED
  
  FIXED, REMOVABLE
  SCREW, CEMENT
  # FIXTURES
  GRAFTING, ONE STAGE OR TWO
  HEALING TIME
  PROVISIONALIZATION
  MEDICAL COMPLICATIONS
  PROGNOSIS
3. **ESTABLISH A TRUE INTERDISCIPLINARY TREATMENT PLANNING PROTOCOL WITH YOUR LAB TECH**

- Mounted case with wax up to lab
- Same anticipations you have had with surgeon
- Get cost estimate
- Understand “labbies” will have their own bias, you are the control
4. **PLAN FOR CONTINGENCIES**

- Complications may occur, do enough implants and they will occur.
- PIA factor, difficult patient, limited opening.
- How badly do you want this case?
- How many Maalox moments is this case going to cause?
DETERMINING YOUR FEE

• HOURS SPENT × DOLLAR/HOUR + LAB AND COMPONENTS + CONTINGENCY FEE = COST TO PATIENT
6. **DEVELOP AN EFFECTIVE CASE PRESENTATION**

- **YOU DID YOUR HOMEWORK**
- **PRESENT THE PLAN IN AN EFFECTIVE, ORGANIZED, METHODICAL AND PROFESSIONAL MANNER**
- **USE OF DIGITAL CAMERA AND POWERPOINT, USE YOUR OWN CASES FOR EXAMPLES HELPS ESTABLISH CREDIBILITY YOU ARE THE ONE TO PROVIDE THESE SERVICES**
- **EXISTING CONDITIONS, CHIEF COMPLAINTS, TREATMENT OPTIONS**
- **CONSENT AND RELEASE FORMS**
“SELLING” THE VALUE OF YOUR SERVICES CANNOT BE DONE IF YOU HAVE NOT DONE YOUR HOMEWORK...

IF YOU HAVE DONE YOUR HOMEWORK AND LOOKED AT THE CASE FROM EVERY ANGLE, THE CASE PRESENTATION COMES OFF FLAWLESSLY...

HAVE A SPOUSE OR FAMILY MEMBER ATTEND THE PRESENTATION...

GIVE THE PATIENT YOUR UNDIVIDED ATTENTION DURING THE CASE PRESENTATION. DON’T BE JUMPING UP FOR HYGIENE CHECKS, HAVE A NON DENTAL ROOM FOR THE CONSULT IF FEASIBLE...

OFFER THE PATIENT THE OPTION TO TALK TO OTHER PATIENTS THAT HAVE HAD THE LIKE PROCEDURE...

GIVE PATIENTS A HARD COPY OF THE PROPOSAL, TIME LIMIT FOR HOW LONG THE FEES ARE VALID, FINANCIAL ARRANGEMENTS, AND CONSENT FORMS...
MUTIPLE TOUCHES

• SEE YOUR SIGN
• WEB SEARCH
• ANGIE’S LIST, BBB
• SEE YOUR WEB SITE
• SEE FACEBOOK, TWITTER
• TALK TO A PATIENT OF RECORD
• CALL THE OFFICE
• DIAGNOSTIC DATA GATHERING
• TREATMENT CONSULTATION
• FOLLOW UP PHONE CALL
• HAND WRITTEN NOTE FROM DOC
• INFORMATIONAL LITERATURE
DIGITAL CO-DIAGNOSIS  (GLENN KRIEGER, DDS)

A PROCESS IN WHICH THE PATIENT HELPS DIAGNOSE THE CASE THEMSELVES BEFORE ANY TREATMENT IS PRESENTED

WWW.BETTERDENTALIMAGES.COM
THE FOUR BASIC QUESTIONS EVERY PATIENT IS ASKING (EVEN IF THEY AREN’T ASKING)

1. WILL THIS HURT?
2. DO I REALLY NEED THIS?
3. HOW LONG WILL IT TAKE?
4. HOW MUCH WILL THIS COST?
AN EFFECTIVE STAFF

- WORKS OUT IN FRONT OF THE DENTIST
- HOLDS THE PATIENT’S CONCERNS IN PLAIN SIGHT TO KEEP THE DENTIST FOCUSED
- HAS DONE THEIR HOME WORK BEFORE THE PATIENT WALKS THROUGH THE DOOR
- IS CROSS TRAINED AT LEAST TO A BASIC UNDERSTANDING
7. **OFFER FINANCIAL OPTIONS**

- Be comfortable with your fees, create value
- Third party financing, credit cards
- If total patient responsibility, have them pay at least \( \frac{1}{2} \) at the start of treatment and balance upon completion
- Professional courtesy for payment up front
8. FOLLOW UP PROSPECTIVE PATIENTS

- TICKLER FILES

- FOLLOW UP UNTIL YOU GET A DEFINITIVE TERMINATION (6 MONTHS)
9. **FOCUS ON PRACTICAL SCENARIOS**

- SET YOURSELF UP FOR SUCCESS
- START WITH A SINGLE TOOTH IN A NON ESTHETIC ZONE
- “BABY STEPS”
- GRADUALLY INCREASE LEVEL OF DIFFICULTY
THE DAY TO DAY REALITIES OF TREATMENT PLANNING FOR YOUR PATIENTS

- PATIENT'S OVERALL HEALTH
- PATIENT'S DESIRES
- ECONOMICS
- PAST DENTAL HISTORY
- YOUR COMFORT LEVEL
- RELATIONSHIP WITH SURGEON, LAB
- YOUR PRACTICE PHILOSOPHY
EACH CASE NEEDS TO BE EVALUATED INDIVIDUALLY...

NOT EVERY SHOULD BE ENDO...
AND EQUALLY
NOT EVERY TOOTH SHOULD BE EXTRACTED AND REPLACED BY AN IMPLANT
NEEDS APICO
THERMOFIL RETREAT
DOUBT ABOUT FRACTURE
GOING TO BE A WEAK LINK
PERiapICAL CYST TO THE LATERAL
MY POST ISN’T AS SECURE AS MY ABUTMENT
NEEDS 2 REFERRALS OUT OF MY OFFICE
RADIOGRAPHS AND SURGICAL GUIDES
BIGGER CASES... IS A CBCT STANDARD OF CARE?

1. DEFINITION OF ANATOMY, VITAL STRUCTURES ON A 3-D LEVEL PRIOR TO SURGERY
2. LIABILITY
3. “TWO SWINGS” AT THE SAME BALL
4. PRECISION PLANNING FROM DESIGN TO DELIVERY
5. EASE AT SURGERY WITH MORE ACCURATE DRILLING AND PLACEMENT (CHAIR TIME)
6. ALLOWS THE OPTION OF MINIMALLY INVASIVE FLAPLESS ENTRY PROCEDURES (COMPROMISED SITUATIONS)
7. COMMUNICATION OF SURGEON, RESTORATIVE, LAB
8. IMMEDIATE RESTORATIONS
"CROWN-DOWN APPROACH"

IF YOUR PLAN IS BASED ON FAULTY DATA, THE "CASCADE" BECOMES EXPONENTIAL WORSE BY THE TIME YOU GET TO THE FINAL RESTORATION....
The Rules of Six

For simple, successful single tooth restorations

- 6mm of inter radicular space
- 6mm of buccolingual osseous dimension
- 6mm of inter occlusal distance
- 3/2 rule for placement

Courtesy Dr. Lyndon Cooper. Personal Communication
3/2 Rule for Implant Esthetics

1. 3mm apical to the marginal crestal zenith of the planned restoration
2. 2 mm lingual to the marginal crestal zenith of the planned restoration
The repair process may result in marked acceleration in height and width of the alveolar ridge. Some studies report as little as 0.7 to 1.5mm bone loss while others report up to 4mm.


Most of the dimensional changes take place in the first three months following extraction.


Unfavorable ridge resorption may affect proper implant placement...

CLINICAL GOALS FOR SITE PRESERVATION

1. Optimize function and esthetics by preserving both the hard and soft tissue volume
2. Maintain a stable osseoconductive environment or scaffolding within the entire socket
3. Isolate the osseoconductive environment from the potential harmful oral debris during healing
4. Maximize the supply of osteoprogenitor cells to the site providing a scaffolding which is eventually replaced by vital mineralized bone
5. Creation of an inconspicuous restoration
STEP BY STEP TECHNIQUE OVERVIEW

1. GENTLE REMOVAL WITH PERIOTOMES, FORCEPS
2. DEBRIDE SOCKET WITH HAND CURETTES AND OR PIEZO SCALPEL
3. DETOX WITH CHX
4. PLACE GRAFT MATERIAL
5. COLLAGEN MEMBRANE
6. SUTURE
7. MEDICAL GRADE ADHESIVE
8. PROVISIONAL

SCLAR BIO-COL TECHNIQUE

THE THREE C’S OF PROPER EXIT FORM

1. CULTIVATE

2. CAPTURE

3. CONTROL
# CULTIVATING EXIT FORM AT THE TIME OF SURGERY

<table>
<thead>
<tr>
<th>ADVANTAGE</th>
<th>DISADVANTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN MANIPULATE TISSUES IMMEDIATELY</td>
<td>working in wet field</td>
</tr>
<tr>
<td>LESS POST OPERATIVE MAINTENANCE</td>
<td>introduction of materials into surgical field</td>
</tr>
<tr>
<td>CAN IMMEDIATELY START ESTHETIC EVAL</td>
<td></td>
</tr>
</tbody>
</table>
SCREW RETAINED PROVISIONALS

- ELIMINATES CEMENT RETENTION ISSUES
- ALLOWS CULTIVATION OF TISSUES IMMEDIATELY
- TAKES GUESSWORK OUT OF MARGIN PLACEMENT WITH A CUSTOM ABUTMENT
- EASY REMOVAL FOR ADDITIONS OR CORRECTIONS
- IMMEDIATE EVALUATION OF ESTHETICS
- BIGGER CASES PROVIDES A TEMPLATE FOR FABRICATION OF DEFINITIVE PROSTHESIS
Stock abutments

- The only modification that can be done is reduction
- Reduction means more apically positioned margins
- More apically positioned margins means greater difficulty removing cement
- Cement retention causes rapid irreversible bone loss
- Ideal exit form is created only with the restoration
THE PITFALLS FOR ONE ABUTMENT ONE TIME...

Compendium
October 2013, Volume 34, Issue 9
Published by AEGIS Communications

One Abutment–One Time: The Negative Effect of Uncontrolled Abutment Margin Depths and Excess Cement—A Case Report
Alfonso Piñeyro, DDS; and Lloyd M. Tucker, DMD, MSD

Abstract:
It has been reported that repeated connection and disconnection of transmucosal components stimulates apical repositioning of the soft tissues and marginal bone resorption. Limiting the number of times this occurs may be beneficial. A new treatment concept called “one abutment–one time” describes the placement of the definitive abutment at the time of surgery. This case highlights the susceptibility of excess cement residue associated with this concept and unesthetic outcome even when meticulous surgical correction is attempted.

Implants have become an important treatment consideration for the replacement of missing teeth in the partially edentulous patient. This could be attributed to the high success rates associated with dental implants. The demand for faster treatment and the search for improved esthetic outcomes through the preservation of bone and soft tissue have led to an evolution in implant therapy.

Modern implant therapy includes many different treatment protocols that do not follow traditional guidelines. These include the addition of a roughened titanium surface, immediate implant placement, and immediate loading or provisionalization. Immediate implant placement and provisionalization have some advantages, which include the combination of extraction, implant surgery, and restorative treatment. This may also theoretically improve esthetic results by decreasing the number of surgical interventions and by utilizing the provisional restoration as support for the gingival tissues.

It has been reported that subsequent disconnections and reconnections of abutment components may compromise the mucosal barrier and result in a more apically positioned zone of connective tissue and increased bone remodeling. The additional marginal bone remodeling and soft-tissue recession may compromise the esthetic outcome. Conventionally, there are multiple component dis/reconnections throughout the treatment. This dis/reconnection process may involve many transmucosal components, such as the healing abutment, impression coping, provisional abutments, and final abutments. Recently, the connection of the definitive abutment at the time of surgery has been suggested (one abutment–one time). The goal of this treatment concept is to eliminate all of the dis/reconnections that occur with treatment. Some advantages of this treatment may include a faster treatment time, delivery of a provisional restoration at the time of implant placement, and a reduction in the number of appointments.

The following case report describes an immediately placed implant in combination with the immediate delivery of the definitive abutment and provisional restoration.
WHY IS CUSTOM ABUTMENT AN ADVANTAGE FOR YOUR PRACTICE?

• Outstanding function and esthetics – as close to natural prepped teeth as you can get
• Simple restorative procedure with reduced chair time – just take an implant-level impression and send the impressions to your dental laboratory
• Eliminates the need for inventory of stock abutments
• Platform independent and available in the materials you want
Attributes of an ideal abutment

- Provides path of insertion for prosthesis
- Margins at or slightly below the gingival margin
- Margins follow gingival architecture in all dimensions
- Abutment allows for normal emergence profile of prosthesis
- Designed for proper thickness of restorative materials
- The abutment should support the soft tissue foundation
“The emergence profile of a single-tooth implant abutment has a significant effect on the esthetics of the final restoration.”


CUSTOM MILLED patient-specific abutments are designed and fabricated to look like natural prepared teeth.
The Effect of Casting Procedures on Rotational Misfit in Castable Abutments
Stefania C. Kano, DDS, PhD, MS / Paul P. Binon, DDS, MSD / Gerson Bonfante, DDS, PhD, MS / Donald A. Curtis, DMD

The Effect of Casting Procedures on Rotational Misfit in Castable Abutments

**Purpose:** Misfit of implant components has been linked to restorative complications such as screw loosening. Although previous studies have shown a correlation between rotational misfit and screw loosening, the impact of casting procedures on rotational misfit is lacking. The aim of this in vitro study was to evaluate the effect of casting procedures on rotational misfit of cast abutments when compared to machined titanium abutments.

**Materials and Methods:** Forty-eight external hexagonal implants and 48 abutments were placed in 4 groups of 12 samples each: (1) machined titanium abutments, (2) premachined palladium abutments cast-on with palladium, (3) plastic burnout abutments cast with nickel chromium, and (4) plastic burnout abutments cast with cobalt chromium. Rotational misfit between the external hexagon of the implant and the internal hexagon of the abutment was measured using standardized techniques and recorded in degrees. Mean values for each group were analyzed with analysis of variance and Tukey test.

**Results:** The mean rotational misfit was 1.21 ± 0.57 degrees for machined titanium abutments, 1.77 ± 130 degrees for cast-on abutments, 1.98 ± 0.72 degrees for cast NiCr abutments, and 2.79 ± 1.13 degrees for cast CoCr abutments. Significantly greater rotational misfit was recorded with cast CoCr abutments when compared to machined titanium abutments (P < .05).

**Conclusion:** Rotational misfit was less than 2 degrees for all groups except for cast CoCr abutments, which demonstrated a significantly greater rotational misfit. Int J Oral Maxillofac Implants 2007; 22:575–579
The aim of this **dog study** was to evaluate the soft tissue response to abutments made of Titanium, Zirconia (ceramic) or AuPt-alloy (cast-to) placed on OsseoSpeed implants after a 1-month use of ordinary healing abutments. Histological sections were prepared after 2 and 5 months of follow-up.

It was shown that the soft tissue dimensions to Titanium and Zirconia were stable throughout the study, while at the AuPt-alloy, the barrier epithelium and the marginal bone moved apically. Also, the connective tissue towards the AuPt-alloy abutments contained less collagen and fibroblasts, and more leucocytes than the tissue to the Titanium- and Zirconia-abutments.

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**Scientific Management comments:**

- This study supports the use of ceramic and titanium abutments, while AuPt-abutments did not provide the same stable soft and hard tissue support.
- The AuPt (cast-to/CastDesign) abutments provides a

PURPOSE:
The purpose of this study was to compare zirconium oxide and titanium alloys with respect to their tendency to adhesion and colonization of two periodontal pathogens on both hard surfaces and on soft tissues in vivo.

MATERIALS AND METHODS:
The present study was designed as a prospective stratified randomized controlled clinical trial. Patients were scheduled to receive two implants with different types of abutments in the posterior mandible. Three months after implant placement, titanium and zirconium abutments were connected. Five weeks after abutment connections, the abutments were removed, probing depth measurements were recorded, and gingival biopsy samples were obtained. Abutments and biopsy specimens were analyzed by reverse-transcriptase polymerase chain reaction to compare the DNA copy numbers of Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis, and total bacteria. The surface free energy of the abutments was calculated by sessile water drop before replacement.

RESULTS:
No statistically significant differences were found between probing depths or DNA copy numbers of A actinomycetemcomitans, P gingivalis, and total bacteria both for both titanium alloys and zirconium oxide surfaces and the biops specimens obtained from their buccal gingival. With respect to the surface free energy of zirconium and titanium abutments, zirconium abutments showed lower surface free energy than titanium abutments.

CONCLUSION:
The results of this study showed that zirconium oxide surfaces have comparable properties to titanium alloy surfaces in their tendency to adhesion and colonization of two periodontal pathogens on both hard surfaces and in soft tissues.
FACTORS TO CONSIDER WHEN DECIDING WHICH MODALITY WILL BE USED

1. ESTHETICS
2. RETRIEVABILITY
3. RETENTION
4. PASSIVITY
5. OCCLUSION
6. ACCESSIBILITY
7. PROVISIONAL RESTORATIONS
8. LAB COSTS
FULLY EDENTULOUS CASES

- 2 IMPLANT MINIMUM FOR MANDIBULAR OVERDENTURE
- 4 IMPLANT MINIMUM FOR MAXILLARY OVERDENTURE
- 6 IMPLANT MINIMUM FOR MAXILLARY FIXED BRIDGE
- 4 IMPLANT MINIMUM FOR MANDIBULAR FIXED BRIDGE
- ALWAYS FABRICATE YOUR RESTORATION AT ABUTMENT LEVEL WHETHER ITS CEMENTED OR SCREW RETENTION
THREE GUIDELINES THAT HELP DETERMINE WHAT TYPE OF PROSTHESIS WILL BE BEST FOR THE PATIENT

- DISTANCE FROM THE PROPOSED INCISAL EDGE TO THE CRESTAL BONE
- GAG REFLEX
- LIP POSTURE
Rehabilitation of the maxillary arch with implant-supported fixed restorations guided by the most apical buccal bone level in the esthetic zone: A clinical report

- This article describes a prosthetically-driven protocol for the rehabilitation of the completely edentulous maxillary arch using immediate implant placement and loading techniques. After the incisal edges of the planned maxillary central incisors are determined, the most apical buccal bone level in the esthetic zone serves to guide complete arch rehabilitation.

IF THIS DISTANCE IS 14mm OR LESS

CONVENTIONAL CROWN AND BRIDGE IS INDICATED AND THE PINK ESTHETICS ARE NOT A CONCERN
IF THIS DISTANCE IS GREATER THAN 14mm

THE PINK ESTHETICS MUST BE PART OF THE RESTORATION
PLANNING OVERDENTURES

RULE 1

NEVER ADD ATTACHMENTS TO SOMONE ELSE’S DENTURE
1. IMPLANT RETENTION WILL NOT MAKE UP FOR A POORLY EXTENDED DENTURE BASE

2. SUCCESS IS BASED UPON STRICT ADHERENCE TO SOUND PROSTHETIC PRINCIPLES SUCH AS VERTICAL DIMENSION, OCCLUSION, PROPER EXTENSION
DISCUSS TIMING OF IMPLANT PLACEMENT WITH YOUR SURGEON

1. IMMEDIATELY AT TIME OF EXTRACTIONS
2. DELAYED AFTER HEALING
RULE 4

BARS ARE FOR DRINKING (LYNDON COOPER)

1. YOU CAN CONFIDENTLY PROVIDE OVERDENTURES ON UNSPLINTED PARALLEL IMPLANTS
2. BARS MAY BE INDICATED IF YOU HAVE SHORT, NARROW IMPLANTS IN POOR BONE
3. BARS ARE INDICATED IF YOUR IMPLANTS ARE NOT PARALLEL
4. BARS MUST ALLOW ROTATION (ROUND OR PEAR SHAPED)
5. BARS ADD COST TO YOUR CASE

- Dolder bar group with 18 cases (43 implants) and a ball attachment group with 18 cases (51 implants)

- No significant difference with respect to the soft tissue health status or patient satisfaction

- Bench-top study
- Parallel bal, ovoid bar, round bar, ball attachments
- Found it was a suitable mechanism to measure denture movement
- No significant differences in the different types
- Concluded the studies must be done in vivo
120 implants placed and the denture “loaded” with tissue conditioner. One stage surgical approach. 96% success rate.

Also see same author Clin Oral Implant Res 1999:10;297-306

• 110 edentulous patients
• Mandibular overdenture supported by two implants with ball attachments, two implants with an interconnecting bar, or four interconnected implants
• No significant difference was found between the three treatment strategies
• Simple implant treatment such as an overdenture retained by two ball attachments is sufficient
Tokuhisa m. et.al. In Vitro Study of a mandibular Implant Overdenture Retained with Ball, Magnet, or Bar Attachments: Comparison of Load Transfer and Denture Stability  Int J Prosth 2003;16: 128-34

• Bench top study
• ITI fixtures in cuspid areas
• Bar attachment induced the greatest axial force and bending moments on both loading and non-loading side
• Magnets least stress, least stable
• Ball attachment best overall stress distribution and stability
RULE 5

FOLLOW DESIGN RULES FOR PREDICTABILITY
<table>
<thead>
<tr>
<th>Okay</th>
<th>This alternative represents the ideal solution. The clips should be placed between the implants to distribute the load.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Okay</td>
<td>This solution is biomechanically less favorable than the previous solution because the lateral forces are less optimally distributed to all implants.</td>
</tr>
<tr>
<td>Caution</td>
<td>This solution should be considered to represent a high biomechanical risk. The prosthesis should be considered as a fixed prosthesis supported by four implants with posterior extensions.</td>
</tr>
<tr>
<td>Caution</td>
<td>This situation represents a moderate biomechanical risk. The implants could be overloaded by lateral forces. Note: It is important that implants be strictly parallel: prosthetic tolerance is less than 5 degrees.</td>
</tr>
<tr>
<td>Okay</td>
<td>Use of only two implants should be considered an extreme biomechanical risk if the bone volume and quality are not optimal and/or if the patient presents with an unfavorable occlusal context.</td>
</tr>
</tbody>
</table>
This alternative represents the ideal solution. The bar should be oriented so that it allows a certain rotation of the prosthesis.

Okay

This alternative also represents a reliable solution.

Okay

This solution represents a substantial biomechanical risk. There is a risk of fracture of the extension and the implant components.

Attention

This solution represents a major biomechanical risk, because the prosthesis cannot rotate. The implants will support all the load, and the solution should be considered to be a fixed prosthesis on three implants.

Attention

This solution may function as a fixed prosthesis and has little biomechanical risk if the implants are well spread. Note: If ball attachments are used, implants must be strictly parallel. The prosthetic tolerance is less than 5 degrees. A bar solution is preferable.

Okay
RULE 6

KEEP YOUR ATTACHMENT CHOICE SIMPLE

1. LOCATORS
2. HADER CLIPS
RULE 7

DON’T LET TEETH GET IN THE WAY OF GOOD DENTISTRY
RULE 8

FOLLOW THESE STEPS FOR A SIMPLE MANDIBULAR OVERDENTURE

1. FABRICATE WELL MADE COMPLETE DENTURE
2. FOLLOW-UP, ADJUST, MAKE PATIENT AS COMFORTABLE AS POSSIBLE
3. REFER FOR IMPLANT PLACEMENT
4. HEALING FOR INTEGRATION, TISSUE CONDITION
5. PLACE LOCATOR ABUTMENTS
6. ENGAGE THE ATTACHMENTS EITHER CHAIRSIDE WITH COLD CURE RESIN OR OVERNIGHT RELINE
RULE 9

COMPREHEND THE ROOM NEEDED FOR COMPONENTRY
RULE 10

UNDERSTAND COMPLICATIONS AND MAINTENANCE ARE PART OF THE OVERDENTURE
RULE 11

UTILIZE TODAY’S AVAILABLE TECHNOLOGY

1. CBCT, AND COMPUTER GUIDED SURGERY
2. MILLED VS. CAST BARS
STEPS FOR FULL ARCH RESTORATIONS

1. COMPREHENSIVE EXAM RESTORATIVE AND SURGICAL
2. MOUNTED DIAGNOSTICS
3. TEAM COLABORATION
4. DEFINITIVE TREATMENT PLAN
5. PRIMARIES, SECONDARIES, JAW RELATIONSHIPS, TRY IN
6. DELIVERY OF NEW UPPER DENTURE
7. CBCT, DUAL SCAN TECHNIQUE
8. FABRICATION OF SURGICAL GUIDE
9. IMPLANT SURGERY, ABUTMENT CONNECTION
10. IMMEDIATE CONVERSION TO FIXED PROSTHESIS
11. HEALING PHASE 8 WEEKS
12. DEFINITIVE ABUTMENT LEVEL IMPRESSION
13. FINAL SET UP, SPLINT VERIFICATION
14. SCANNING BY LAB FOR FRAME MILLING
15. FRAMEWORK TRY IN
16. FINAL WAX TRY IN ON THE FRAME
17. PROCESSING
18. DELIVERY
19. POST OP RECALL VISITS
A Comparison of the Accuracy of Fit of 2 Methods for Fabricating Implant-Prostodontic Frameworks

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Pages: 125–131
PMID: 17455431

Purpose: To compare the in vitro 3-dimensional (3D) accuracy of fit of laser-scanned Computer Numeric Controlled (CNC)–milled implant titanium frameworks to that of conventional cast frameworks. Materials and Methods: Nine cast frameworks were fabricated on the mandibular master casts of 9 patients with 5 implants each following the well-established conventional fabrication technique. The frameworks were then laser scanned, and 9 CNC-milled titanium frameworks matching the outline of the conventional frameworks were fabricated. The accuracy of fit of both framework types was measured using a contact-type coordinate measuring machine and a computer program developed specifically for this purpose. Statistical analysis was done by a series of paired t tests. Results: The laser-scanned CNC-milled frameworks showed significantly less distortion along the x-axis (transversal, dx) compared with the conventional frameworks (means: 33.7 µm and 49.2 µm, respectively) (P = .011). The titanium frameworks also demonstrated significantly less distortion on the horizontal plane compared with the conventional frameworks (means: 56 µm and 85 µm, respectively) (P = .012). The dy (sagittal) and dz (vertical) axes and total 3D distortion (∑(dx)^2 + (dy)^2 + (dz)^2) showed less distortion overall in the laser-scanned CNC-milled frameworks, but this was not statistically significant (mean: 22.3 vs 35.6 µm, 13.3 vs 59.2 µm, 51 vs 114.1 µm, respectively, for y, z, and 3D distortion). Conclusion: Within the limitations of this study, fabrication of an implant-prostodontic framework using the CNC milling technique yields a more accurate fit than the currently used cast technique. In vivo studies are needed to investigate the clinical significance of this recorded difference. Int J Prosthodont 2007;20:125–131.

The purpose of this study was to evaluate and compare the precision of fit of milled one-piece Titanium fixed complete denture frameworks to that of conventional cast frameworks.

Milled one-piece Titanium fixed complete denture frameworks provided a more accurate precision of fit than traditional cast frameworks.
Biag, M. Multi-unit implant impression accuracy: A review of the literature. Quintessence International 2014, 1;39-51

1. PVS AND PE SEEM TO BE IMPRESSION MATERIALS OF CHOICE
2. PICK UP IMPRESSION TECHNIQUE IS MARGINALLY BETTER THAN TRANSFER TECHNIQUE
3. SPLINTING DID NOT SEEM TO AFFECT THE ACCURACY
4. DEVIATIONS IN ANGULATIONS INCREASE INACCURACY
5. DIGITAL IMAGING NEEDS MORE TESTING
6. SPLINT VERIFICATION MANDATORY (bf)

59 STUDIES REVIEWED
UNI FOR FIXED IMMEDIATE RESTORATIONS

INDICATIONS/JUSTIFICATIONS

1. LACK OF POSTERIOR BONE
2. PATIENT DESIRES FIXED PROSTHESIS
3. TERMINAL EXISTING DENTITION
4. DECREASED COST OF TREATMENT RELATIVE TO BONE GRAFTING TECHNIQUES
5. HIGH SUCCESS RATES
6. RELATIVELY EASY, SAFE AND
UNI FOR FIXED IMMEDIATE RESTORATIONS

CONTRAINDICATIONS

1. SIGNIFICANT RADIATION
2. COMPROMISED IMMUNE SYSTEM
3. ACTIVE BISPHOSPHONATE THERAPY
MANDIBULAR IMPLANT PLANNING

➢ ANATOMIC CONSTRAINTS
  - Inferior alveolar nerve
  - Lingual artery

➢ ANTERIOR-POSTERIOR SPREAD
  - Abutment screw behavior
  - Prosthetic durability

➢ OCCLUSAL-GINGIVAL HEIGHT
  - Esthetics/Phonetics
  - Prosthetic durability
BIGGEST MISTAKES IN TREATMENT PLANNING

1. UTILIZING A CBCT WITHOUT SCAN PROSTHESES
2. UTILIZING AN EXISTING DENTURE AS A GUIDE TO PLANNING IMPLANT PLACEMENT THAT DOES NOT MEET ESTHETICS, OCCLUSAL AND PHONETIC REQUIREMENTS
3. NOT UTILIZING ALL THE BONE AVAILABLE FOR FIXTURE PLACEMENT
4. NOT PREFORMING ADEQUATE CRESTAL REDUCTION THUS CAUSING RAMIFICATIONS WITH PROSTHESIS LONGEVITY
THE RULE OF 10/15/10

For a successful implant supported or implant retained mandibular prosthesis

- > 10 mm of residual mandibular height
- > 15 mm of restorative space
- > 10 mm of anterior/posterior spread

COMPLIMENTS OF: DR. LYNDON COOPER
THE KEY IS A P SPREAD

10MM MIN
PROJECT MANAGEMENT FLOW CHART

- PLANNING IS COMPLETED
- IMMEDIATE DENTURE COMPLETED
- SURGICAL, RESTORATIVE TEAMS, LAB SUPPORT COORDINATED
- UNI ABUTMENTS, IMPLANT PICK-UPS, TEMPORARY CYLINDERS, ANALOGUES, BRIDGE SCREWS IN HAND
- IMPLANTS PLACED
- PATIENT RETURNS TO RESTORATIVE TEAM FOR IMMEDIATE PROVISIONALIZATION
When can I immediately load an implant?

• When there is an absence of infection
• When there is presence of buccal bone
• When you achieve primary stability at the proper depth of placement
POST OP INSTRUCTIONS AND FOLLOW-UP

1. ALL POST-OP INSTRUCTIONS GIVEN ORALLY AND WRITTEN
2. ICING FIRST 24-48 HOURS
3. CONTINUE WITH ANTIBIOTICS, PAIN MEDS
4. NO SMOKING OR ALCOHOL
5. WARM SALT WATER OR CHX RINSES TWICE DAILY
6. ORAL HYGIENE GENTLY AFTER 24-48 HOURS POST OP
7. NO SOLID FOODS UNTIL RETURN VISIT
8. RETURN VISIT APPROX 2 WEEKS SUTURE REMOVAL
2 WEEK POST OP

1. DO NOT REMOVE PROSTHESIS
2. CHECK TORQUE ON BRIDGE SCREWS
3. CHECK OCCLUSION
4. REVIEW ORAL HYGIENE
5. REMAIN ON SOFT DIET
6. RETURN VISIT 2 WEEKS
TARNOW, D. Et.al. Immediate Loading of Threaded Implants at Stage 1 Surgery in Edentulous Arches: Ten Consecutive Case Reports with 1 to 5 Year Data. JOMI 1997; 12: 319-327.


CARMAGNOLA, D. Et. Al. Time Sequence of Bone Healing Around

BLOOD CLOT FORMATION AND DEBRIS REPLACED BY PROVISIONAL CONNECTIVE TISSUE FOLLOWED BY MINERALIZATION AFTER 3-4 WEEKS.

WOUND HEALING PHASES

1. HEMOSTASIS
2. INFLAMMATION
3. PROLIFERATION
4. REMODELING

Disturbed healing is associated with a continuation of the early inflammatory phase and the development of a toxic wound environment.

The literature states that this technique results in a higher percentage of maxillary vs. mandibular failures in the order of 5-6 times.

RETROSPECTIVE STUDY OF 285 PATIENTS OVER 33 MONTHS TO IDENTIFY PRESENTING RISK FACTORS THAT MAY BE PREDICTIVE IN INITIAL TREATMENT PLANNING
HIGHEST RISK

Male Patient
Opposing Natural Dentition
Poor Bone Density

LESSER RISKS

Systemic Factors
Local Infections/Pathology
Opposing Complete Arch Implant Reconstruction
Bone Volume
Smoking
Bruxism
Distal Posterior Implant Site
Conus overdenture

- REMOVABLE
- ALLOWS ACCESS FOR HYGIENE
- LESS COSTLY LAB FEES
- VERY RIGID RESTORATION
- ORIGINALLY DEVELOPED FOR ANKYLOS SYSTEM BUT CAN BE USED FOR ANY PLATFORM
- REQUIRES 10 MM MINIMUM IOD
- ANKYLOS = STOCK ABUTMENTS
- OTHER PLATFORMS = ATLANTIS SOLUTION