Soft Tissue Development in the Esthetic Zone

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Agenda

• Single teeth and immediate restoration
• Soft-tissue preservation
• Soft-tissue development
• Multiple adjacent implants

Implant Esthetic Hierarchy

Soft tissue profile determined by 3 factors

1. Osseous levels
2. Volume of connective tissue, biotype
3. Proximal support of crowns


Optimal soft-tissue esthetics

• Extraction with immediate implant placement and provisional restoration may be best method (not just fastest) of achieving optimal sulcular profiles
• Following established protocols, success rates similar to delayed protocols
• Clinician can significantly influence soft-tissue levels at this stage
• Chairside provisional is an effective and expedient method of soft-tissue development
Refer to separate handout for implant provisional restoration technique

Advantages of Polymer Provisional Components

- Less costly than metal alloy temporary cylinders
- Easier and quicker to prepare
- Warmer gingival tones
- Natural appearance to provisional restoration
- No heat generation or metal filings
- Can be prepared directly on implant

Subtle sulcular modifications

<table>
<thead>
<tr>
<th>Soft tissue profile</th>
<th>Crown contours</th>
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</thead>
<tbody>
<tr>
<td>To position facial margin apically</td>
<td>Increase facial convexity</td>
</tr>
<tr>
<td>To position facial margin coronally</td>
<td>Decrease facial convexity</td>
</tr>
<tr>
<td>To position papilla apically</td>
<td>Decrease proximal contours</td>
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Value of implant provisional

- Based on the reviewed studies, the literature does not identify strong scientific evidence that esthetic outcomes are influenced positively or negatively by utilization of a provisional prosthesis
- A provisional prosthesis remains strongly recommended in order to test the planned final prosthesis, to facilitate maturation of healing tissue, and for patient convenience


Recommendations for immediate implant restoration

- Immediate restoration should be considered when bone volume at site is close to ideal
- 40 Ncm or more initial seating torque
- Screw-retained provisional restoration recommended, out of functional occlusal contacts
- Restoration not removed during healing period of 6 weeks


Recommendations for immediate implant restoration

- Soft diet for 8 weeks
- No brushing in area for a few days, then soft brushing for 2 weeks.
- Flossing gently after 1 week
- Chlorhexidine gluconate, 60 second rinse at least once a day, preferably at bedtime, until completed
Why screw-retained provisional restorations for soft tissue development?

- Easier to remove one component during adjustment rather than abutment and crown
- Emergence profile begins at implant level with screw-retained restoration
- Difficult to get smooth emergence profile from prepared margin to crown with cement retained
- No cement margin to be concerned with using screw-retained
- Gently expand tissue by slowly tightening screw

• Single implants inserted in fresh extraction sockets and immediately provisionalized
• Bone-to-implant gap grafted with bovine bone
• After 3 months, ceramic crowns placed.
• No statistical differences found between baseline and 1 year


Agenda

- Single teeth and immediate restoration
  - Soft-tissue development

Soft tissue impression technique

- Remove screw-retained provisional restoration
- Attach implant analog
- Seat provisional and analog in silicone putty at least 1/3 way up the crown
- Unscrew provisional after silicone sets

Soft tissue impression technique

- Attach pick-up impression coping to analog in matrix
- Inject flowable composite resin into void left by provisional, capturing sides of impression coping
- Remove impression coping from matrix and seat on implant
- Make open-tray implant impression
Ceramic screw-retained crowns

- Esthetics of a ceramic restoration
- Potential of residual cement eliminated
- Access opening easily masked
- Deeper ceramic margin accommodates recession
- One margin instead of two
- Predictable retrievability
- Open contact more easily corrected
- Particularly useful with shallow sulcus or thin biotype

Implants and open contacts

- Columbia U, literature review
- Mesial drift occurs throughout life
- Because implants act as ankylosed teeth, they remain in place while teeth mesial to them drift
- If implants are placed in growing individual, continued growth can result in open contact


Ceramic screw-retained crowns

- Electronic search from 2000-2012
- “Although no statistical difference was found between cement- and screw-retained reconstructions for survival or failure rates, screw-retained reconstructions exhibited fewer technical and biologic complications overall.”


Agenda

- Multiple adjacent implants

The rule of 3x3x3 PIE: Adjacent implants

1. The platforms of the implants should be located 3 mm apical to the zeniths of the predetermined facial-gingival margins of the planned restorations

2. The centers of the implants should be placed at a distance of at least 3 mm palatal to the anticipated facial margins

The rule of 3x3x3 PIE:
Adjacent implants

3. At least 3 mm interimplant spacing is required between adjacent implant platforms

4. The implants should emerge through the palatal incisal edges (PIE) of the ensuing crown positions

Must have skilled technician to achieve optimal contours without provisional

Restorative potential between adjacent implants

- Preservation of crestal and interseptal bone
- Optimal support of available soft tissue with crown and abutment contours
- Long contact areas
- Elimination of black triangles
- Fluorescent ceramics on proximal surfaces of restorations

Cement margins and peri-implant disease

- 39 consecutive patients (42 implants) in private practice exhibiting signs of peri-implant disease during 5-year period
- 12 similar implants with no disease served as controls
- Excess cement found by endoscopic examination in 34 test sites and none in controls
- 25 of 33 sites resolved when cement was removed


YOU MUST HAVE THE OSSEOUS POTENTIAL FOR OPTIMAL SOFT TISSUE DEVELOPMENT

Asymmetric papilla levels

- Altered images of women’s smiles rated by general dentists, orthodontist and laypersons
- Unilateral reduction of papillary height rated less attractive than bilateral alteration by dentists
- Laypersons did not find discrepancies of 2 mm unattractive

## Implant timing

Failing teeth are to be placed alternatively to ensure periimplant tissue stability


## Splinting versus nonsplinting

- **U. Padova, Italy**
- 132 implants placed in 44 patients
- At 10 years, 0.1 mm more bone loss in non-splinted group not considered clinically meaningful


## Risk factors for facial recession

- **Thin tissue biotype**
- **Facial malposition of implant**
- **Thin or damaged facial bone wall**


## Access directed through palatoincisal edge

- **25 patients with central incisor replacements**
- **Contralateral central used as control**
- **An implant in a buccal position resulted in increased crown length compared to contralateral tooth**


## Implant soft tissue profiles over long-term

- **21 participants with 24 single implants**
- **Followed from 16-22 years**
- **Demonstrated stable periimplant soft tissue levels and esthetics in long-term in periodontally healthy patients**
- **However, mid facial recession and eruption may be expected at neighboring teeth**


## Implant placement in buccal or palatal position will significantly influence soft tissue levels
Conclusions

• Optimal implant esthetic outcomes are a culmination of many subtleties in techniques and materials; the provisional restoration is only one of those tools
• The esthetic potential of the soft tissue is primarily determined at the surgical stage, by the site and implant placement
• A provisional restoration cannot make up for compromises in the preceding steps

Conclusions (cont’d)

• Although esthetic value of the provisional restoration is debatable, it is still useful for it’s convenience, comfort, and for pre-establishing the soft tissue profiles prior to definitive restoration
• There is still much we do not know and have to learn to predictably harness the esthetic and soft tissue potential of implant dentistry

For a listing of the products and materials shown in this presentation, visit our website, www.georgepriest.com under heading For Dentists/Recommendations

Rule of 3x3 PIE
1. The implant platform should be located 3 mm apical to the zenith of the predetermined facial-gingival margin of the planned restoration
2. The center of the implant should be placed at a distance of at least 3 mm palatal to the anticipated facial margin
3. The implant should emerge through the palatal incisal edge (PIE) of the ensuing crown position

Anticipated free gingival margin more important than root position in implant placement

Make surgical guide with tooth replacement at planned gingival level; work backwards from here

Chairside screw-retained implant-level provisional restoration technique
Technique used by Dr. George Priest

1. Impress the arch where implant will be placed
2. Pour cast and if tooth is missing or needing contour alteration, it can be waxed directly and a cast made of the waxing. An alternative is to lute a denture tooth in place using flowable composite resin or superglue
3. Make a clear vacuum matrix and trim to one tooth mesial and distal to the area to be restored
4. At the beginning of the appointment, try-in the matrix intraorally to verify seating and accuracy
5. Select an appropriate Biomet 3i PreFormance Cylinder, and using Biomet 3i deactivating tool, deactivate the Certain feature for passive seating of the cylinder
6. Remove the healing abutment and seat the cylinder on the implant with the hand-driver
7. Reduce the cylinder either intraorally or extraorally, about 1 mm short of the incisal edge, using a coarse diamond bur like a Komet "S" series diamond
8. Reseat the matrix intraorally to verify adequate reduction of the cylinder
9. Use a #8 bur to place an access opening through the matrix to the screw opening
10. Shorten a cotton applicator stick to protrude about ½ inch through opening
11. Select an appropriate shade of bis-acryl resin and set timer
12. Inject resin into the matrix and seat it over the stick and cylinder
13. After about 30 seconds, remove the wood stick and insert hand-driver to engage the screw
14. At completion of set, unscrew and remove matrix, provisional restoration and cylinder from the mouth
15. Replace the healing abutment during refinement of the provisional restoration
16. Fill voids with flowable composite resin of matching shade and cure with light
17. Modify subgingival contours by adding or subtracting flowable composite resin
18. Complete contours with the Komet 9554 Universal polishing wheel
19. Try-in intraorally, adjust proximal contacts if necessary and remove from occlusal contact in habitual closing and lateral movements
20. Remove and finish with wet pumice and whiting
21. Reseat and tighten screw to 20 Ncm, fill access opening with Teflon tape and composite resin