MULTIPLE MISSING TEETH

Replacement of missing teeth can vary from a simple fixed partial denture or single tooth implant, to full arch removable dentures. Either extreme with regard to the number of missing teeth can be relatively easy to correct. However, even two adjacent teeth that are missing can become quite a challenge to restore, particularly when esthetics is a chief concern.

It can be argued that two adjacent missing teeth in the anterior sextant may be one of the most difficult restorations to achieve optimum esthetics, particularly when missing anything other than two central incisors. The difficulty lies in obtaining an interproximal papilla between the two missing tooth sites, as well as matching the porcelain on the missing tooth site to the natural tooth adjacent.

Tarnow and Salama have each published research to indicate that the least possible papilla height from osseous crest is achieved when two implants are side by side (~3mm), and the greatest possible papilla height can be achieved around a pontic (~6mm). If this is the case, then an implant restoration with a cantilever pontic should afford the greatest chance for esthetics. When paired with hard and soft tissue grafting, or root banking in the pontic site, the chance of success increases. Even so, factors such as soft tissue biotype and variable patient healing capacities play a formidable role in preventing optimal soft tissue esthetic outcomes.

GUIDED BONE REGENERATION

We reviewed in the prior newsletters that bone can be regenerated when it is lost, but that there are some defects in the ridge separate from the teeth that are so large or involving a particular wall of bone that is missing, that it is imperative to use special additional materials.

These materials either mechanically help to maintain blood clot and space for the blood clot to convert into bone, or in fact help to stimulate bone growth above and beyond simply maintaining space. Space

maintainers include membranes with titanium struts which can be tac'd into place, or tenting screws placed



to better prop up a membrane. Bone growth stimulators include mixing shavings of living bone from an adjacent site to the graft site, or use of biologic materials such as rhBMP



(recombinant human bone morphogenic protein), or a combination of both are used to enhance bone healing.

To add an additional level of difficulty are cases where multiple adjacent teeth are missing, particularly in the anterior maxilla.

This issue of **ProbeTips** will review a very difficult case where significant ridge augmentation was needed to regenerate bone in an anterior maxillary edentulous site as described in the next panel.

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PERIODONTOLOGY IMPLANTOLOGY ORAL MEDICINE

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She is driven to achieve esthetic and predictable outcomes, particularly for anterior implant cases, and is always looking to improve processes and results. You can email her directly below with questions, comments, or suggestions for future newsletters.



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Implant Cantilever Case of the Quarter

STEP 1: RIDGE AUGMENTATION

A 49 year old man had experienced trauma to his anterior teeth many years ago. Tooth #7 had been lost several years prior and replaced with a flipper. Tooth #8 was ankylosed, intruding and very weak. A more definitive treatment was desired.

Replacing two adjacent teeth with a single implant on one side of the midline is a challenge as noted above. The plan was to use an implant at site #8 with a cantilever to replace #7. The papilla between the pontic and implant will never match the papilla between two natural teeth, but the best chance of attaining a papilla is at a pontic adjacent to an implant as opposed to two adjacent implants. His occlusion is such that the cantilever restoration will not be under stress and should have a good long term prognosis.

- A multi-step approach was adopted:1. Removal of #8 first, with several months for soft tissue healing. Note the significant resultant defect in the ridge facially at #8.
- 2. Ridge augmentation with titanium reinforced non-resorbable membrane tac'd into place, and filled with a combination of autogenous shavings mixed with allograft and xenograft, and layered with rhBMP sponges. Proper release of the soft tissue for passive closure over the non-resorbable membrane is critical for proper bone growth. Note again the vertical defect corrected with the titanium reinforced membrane.
- 3. Membrane removal after 9 months of healing with implant placement into a bed of healthy full bone. A large palatal connective tissue graft was placed at this time.



3 months post extraction



CBCT Slice of Grafted ridge 9 months post surgery with Titanium membrane still present and overlay of intended implant size and shape to visualize the significant gain in ridge dimension and prepare a surgical guide for implant surgery.



3 weeks post implant placement and soft tissue grafting

STEP 2: RESTORATION

You can see that with each surgical procedure, the keratinized tissue has been stretched over the graft materials and brings the mucogingival junction more coronally each time. Now that it is time to uncover the implant to restore it, if a simple punch access is made, there will be a discrepancy in the appearance of the keratinized tissue from right to left. This is not only a potential cosmetic concern, but also a functional deficit as keratinized gingiva over the implant is tougher than mucosa and will provide long term strength to the tissues and better bone maintenance around the implant beneath.

In this situation, a split thickness flap was created to move the keratinized gingiva apically to match the natural contralateral side. The temporary screw retained crown is placed at this time. Additionally, a wedge of palatal connective tissue from the lingual surface of the implant was transplanted to the embrasure between the implant and pontic to gain as much tissue there as possible.

After 1 month of healing, the appearance and tissue health both facially and occlusally are as natural as possible, and a wonderful result considering the initial presentation. Final restoration after 1 month.

