

Upgradeable Dentistry, Part 3



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This is Part 3 of a 4-part article series. Part 3 of Dr. Winter's article was published in the July 2009 issue of *Dentistry Today* and can be found in our archived articles at dentistrytoday.com. This, and all future articles that are presented in multiple parts, will now be available to our readers for review in their entirety at our Web site dentistrytoday.com. This is being done to help those readers who may have missed a portion of any multiple-part article, and will also facilitate the ability to review a complete article in its entirety for others.

INTRODUCTION

In Parts 1 and 2 of this 4-part series, the concept of "Upgradeable Dentistry," a subject of particular importance given the current economic conditions, was discussed. This concept, as previously defined, is the diagnostic and treatment paradigm that allows patients to achieve ideal dentistry in phases according to their emotional and financial situation.¹

The concept of "upgradeability" is consistent with the statement that dentistry is dynamic process, *not* a static event. Too often in dentistry, the insurance companies' fee schedules become synonymous with treatment recommendations. If we educate our patients that dentures are not a destination, but a stop along the path to reclaiming proper aesthetics, phonetics, and function, people will be more receptive to a continual dental journey. By introducing the concepts of bone grafting, sinus augmentation, ridge spreading, etc, patients will begin to take responsibility for the continual bone loss caused by edentulism worsened by ill-fitting denture wear.²

Previously, we discussed Turbyfill dentures as taught by Dr. Jack Turbyfill (from his background with his mentor Dr. Earl Pound). We "upgraded" this protocol with the use of small diameter implants to dramatically improve retention of complete and partial denture prostheses. (These techniques were taught to the author by Dr. Ara Nazarian and discussed via interview with Dr. Charles English.)

The next phase of treatment planning to consider will be overdentures and hybrid prostheses.



Figure 1. (Case 1) A severely atrophic mandible. Classification B-w ridge. This required block grafting from the Symphysis to allow for implants to be placed in the ABCDE locations as described by Misch (*Contemporary Implant Dentistry*, third Edition, Mosby)

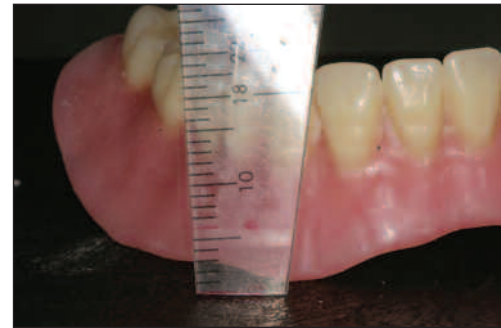


Figure 2. With a height of 22 mm from tissue to incisal edge, a hybrid prosthesis was selected so that acrylic could be used for lost tissue reconstruction. A fixed prosthesis would have excessive weight and expense and the cost of pink porcelain and potential bulk fracture precluded use of porcelain for this restoration.



Figure 3. An approved denture was duplicated in clear acrylic which served a surgical guide to place the 5 implants.

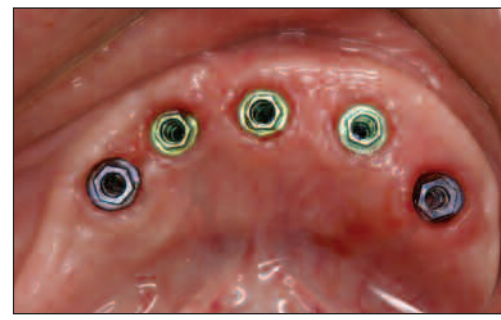


Figure 4. Ideal implant placement of 5 implants (BioHorizons) according to the ideal prosthesis-driven placement. Note the adequate zone of attached gingival secondary to grafting and alloderm placement around the implants.

REMOVABLE PROSTHESES

A removable prosthesis (or RP-5 prosthesis, using nomenclature defined by Dr. Carl Misch) is a prosthesis that is removable and has implant and soft-tissue support. This prosthesis can sit on a combination of implants which are independent, or joined with a bar.³ The use of bars versus independent implants has been debated in the literature.⁴⁻⁶ However, it is generally accepted that the use of an overdenture will result in improved mastication, bone maintenance, and nutrition over standard denture use alone.

CASE 1

A woman presented to our office for treatment planning. She had been to a dentist who wanted her to invest \$20,000 on the restoration of her maxillary arch. This was to include crowns, fixed partial dentures, and the replacement of her lower complete denture.

After assessment of her medical history, desires and finances we decided to use her finances to restore her mandibular arch with symphyseal grafting and a lower hybrid prosthesis. In fact, after finishing our financial considerations related to the out-

lined treatment plan, she would have enough money left over to improve her maxillary aesthetics by replacing an anterior bridge. In Figure 1, we see an atrophic mandible that was deficient in width. Years of denture abrasion, coupled with force factors from existing maxillary dentition, required grafting prior to implant placement. In Figure 2 the height of the existing prosthesis is measured prior to re-establishment of lost occlusal vertical dimension.

The starting point for most implant rehabilitation is the creation of a prototype restoration. This prototype is used to test and evaluate the optimal final tooth positioning for lip line, phonetics, neutral zone creation, and prosthesis design. In this case, the approved lower denture was duplicated in a Lang Duplicator, and the area for implant placement was removed so that the buccal and lingual confines of the prosthesis could be respected with implant placement (Figure 3). Five implants (BioHorizons) were placed in an ideal fashion, with good A-P spread between the mental foramina (Figure 4).

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The use of an acrylic jig (Duralay [Reliance Dental]) is one way to verify accuracy of the impression (Figure 5). When the case is mounted, a window can be left to visualize complete seating of the prosthesis on the implant analog (Figure 6). (The author also does this with bar overdentures so model accuracy can be checked at time of intraoral try-in of bar, hybrid, etc.)

The panoramic radiograph (Panorex) view (Figure 7) shows the minimal cantilever and the ideal parallelism established in the placement of the implants. The left lateral view of the prosthesis shows the lingualized occlusion that is advocated for decreasing force factors to the implants (Figure 8).

The summary of this case can be seen from her pre-operative smile, to her postoperative smile and full-face smile (Figures 9 to 11).

The reason this case is important is not necessarily because of the dentistry performed, rather the mindset



Figure 5. Acrylic (Duralay) impression copings verified impression accuracy prior to fabrication of the metal substructure. Any discrepancy would have necessitated sectioning and re-approximation of segments with a pick up impression.



Figure 6. The prosthesis mounted on an articulator with impression analogs exposed as a secondary verification of seating accuracy prior to processing of the hybrid Prosthesis. (Note: An independent try in with a baseplate and denture teeth was done as an interim step to again check passivity of casting.)

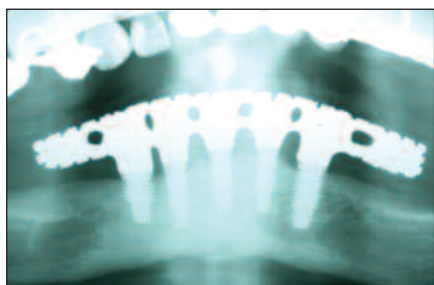


Figure 7. Radiograph showing the completed prosthesis.



Figure 8. Left lateral view showing the lingualized occlusion scheme, blend of upper partial teeth to lower prosthesis teeth, and aesthetics of the replaced maxillary anterior bridge.



Figure 9. Preoperative view of patients' maxillary restorations.



Figure 10. Postoperative smile displaying correct occlusal vertical dimension, golden proportion and overall final aesthetic.

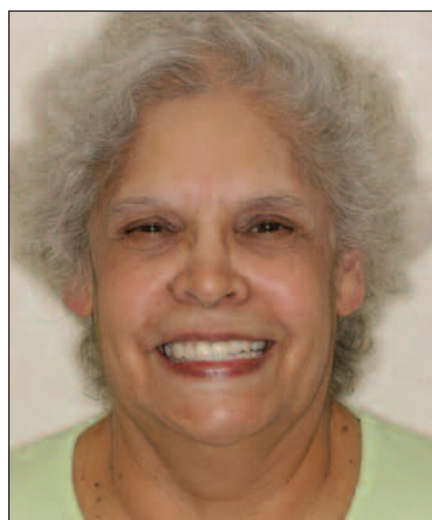


Figure 11. Postoperative full-face view of patient 3 years after hybrid delivery.

needed to help this patient with her primary problem. The dentist who treatment planned her maxillary reconstruction without regard for her "rehabilitation" has really missed the boat. Patients who see you as an advocate to solve their problems become your patients for life. They will certainly entertain your ideas for continual improvement.

CASE 2

With this patient, we also began with a knife-edged ridge. This ridge was leveled by osteoplasty and 4 implants (BioHorizons) were placed between

the mental foramina in the A, B, D, and E positions (Figure 12). These corresponded to the 5 available sites between the mental foramen that would allow us to create a fixed bridge, a hybrid, or an overdenture. After the bar was fabricated and checked for passivity of fit, a metal-reinforced overdenture was fabricated to fit intimately over the milled bar. Within the denture (Figure 13), 2 Bredent attachments (green) and 3 Hader clips were embedded into the metal intaglio of the prosthesis. (Note: the metal frame extends to the retro-molar pads bilaterally, and acrylic is left in contact with the edentulous ridge for better adhesion of future saddle relines.) While we had originally planned to upgrade this patient to fixed bridgework, she was satisfied with the comfort, biting forces, and feel of the lower prosthesis. As a result, she was then pursuing an upgrade to her upper prosthesis. She was educated that she will continue to lose bone in the edentulous free-end saddle area. However, for the time being, she was allowed the dignity of chewing without a mobile denture. Having gained stability, support, and comfort, all of her phase 1 goals were met. Figure 14 shows the mesial-lingualized occlusion in a retracted view. While discussing the sequence of "upgradability," it must be realized that upper dentures opposing newly fixed prostheses will "feel" looser. Upper dentures are typically the den-



Figure 12. (Case 2) Cast mandibular bar for 4 implant overdenture with bredent attachments at distal ends of the bar. Bar is milled for hader clips and for a superior metal housing in the overdenture to engage.



Figure 13. Lower metal reinforced overdenture with 2 Bredent attachments, 3 Hader clips and metal housings milled to fit with the mandibular bar.



Figure 14. Retracted view of upper denture with lower bar-supported overdenture.

The concept of "upgradability" is consistent with the statement that dentistry is dynamic process, not a static event...fee schedules become synonymous with treatment recommendations.

ture that fits and feels good. That is, of course, until the lower arch becomes rigidly fixated. The allocation of a patient's financial resources should take into account the concept of "Combination Syndrome." This phenomenon describes the increased bone loss from pressure opposing the rigidly fixated arch. This arch requires support with implants and a prosthesis so that opposing forces can be offset.⁷⁻⁹ An example of "Combination Syndrome" would be when people have remaining mandibular teeth that have undergone altered passive eruption, and they have a concomitant flabby ridge in the premaxilla.

In the decision making process we must find out the patients' financial comfort level immediately, as well as over the next 3 to 4 years. Then, we can help allocate these funds according to the patients' Chief Complaint

and their greatest need. If the patient presents with partial dentures, we must ask whether or not the bone can be stabilized in the free-end saddle areas. If we have an area of discomfort or severe attrition, can we augment this area and use implants to retain the new bone? If we can help a patient to establish a hierarchy of need, as well as one of desires, then we can help them prioritize their dental rehabilitation with mutual understanding.

CASE 3

This patient underwent extensive treatment due to continually failing dentistry. She was tired of the continual repairs delivered by her previous dentist who had recently treatment planned her for a laser-assisted new attachment procedure (\$5,000) and a precision attachment partial denture.

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This doctor and his team did not accurately assess this patients' needs, wants, and desires.

Her dentition was hopeless and all of her teeth were a constant source of pain. The use of any abutments as part of a precision attachment partial would have led to failure as crown-to-root ratios were 3:1 from advanced periodontal disease. She didn't want to spend a lot of money, and then worry that she would continue to lose her teeth. Emotionally, she could not handle the trauma that this would cause.

The lesson we learned from this patient is: if we allow patients to choose their treatment, they may actually choose ideal treatment; if we don't educate and ask what they really want, we are limiting their prosthetic options to what are our preconceived notions.

In Figure 15, we see her bar-supported overdenture (5 years post-delivery). This bar was fabricated in 2 pieces, with a dovetail to decrease casting inaccuracies. It has 3 Bredent attachments and a full-arch A-P spread, providing excellent stability, support, and retention (Figure 16). In Figure 17 the intaglio of the upper denture can be seen with a full-metal substructure, milled superstructure, and attachments with all-metal housings. The patient's mandibular arch was a fixed implant bridge so Combination



Figure 15. Patient (Case 3) at 5 years post delivery of the overdenture, prior to relining the prosthesis.



Figure 16. Maxillary 8 implant bar, fabricated in 2 pieces with a dove tail for seating and decreasing casting error.



Figure 17. Maxillary Overdenture with metal substructure, cast to fit on the bar with Bredent attachments cast as part of the metal framework.

The goal of implant-supported fixed bridges can be a long term goal and, if properly planned for and staged, can be attainable long-term.

Syndrome has been successfully avoided. Treatment planning of an overdenture versus a fixed bridge is based on need for lip support, patients' psychogenic factors, reparability, cost, and force factors—to name a few of the diagnostic criteria.

CASE 4

This patient presented to our office with 2 failing implants and copings over his canine roots. The lack of an anterior stop caused fulcrums on the posterior implants leading to premature failure. The addition of 5 new implants allowed for a cost effective interim treatment until more implants and fixed bridgework (or a hybrid prosthesis) could be fabricated. Figure 18 shows the locator attachments with a metal substructure in the lower denture, and Figure 19 shows the 5 locator attachments. Figure 20 demonstrates excellent lip support and the benefits of a neutral

zone impression technique.

This patient now desires treatment for his maxillary denture, understands Combination Syndrome, and wants to begin with a locator denture until he can afford more implants and conversion to a fixed hybrid to eliminate the palatal acrylic that interferes with his speech and taste. When the patient can tell you about their desires going forward, they are emotionally invested in the outcome and motivated. Then, as a result, the treatment can be done in phases until completion. If they choose to place 2 implants a year for the next 3 to 4 years, *the vision will become a reality at the patients' pace.*

CONCLUDING REMARKS

The cases presented above all highlight various aspects of dental care that have brought patients to their next level. The treatment is not done until the patient has a result with

which they are happy. When "upgradeable dentistry" is discussed, we must also realize that dentistry must be affordable.

It is also important to note that the cases that are presented in these articles were placed by general dentists with extensive implant training. After graduating from the Misch International Implant Institute, I am able to increasingly perform these cases. The point is, one must have a team that will work together to make this kind of dentistry affordable.

My implant team will offer multiple implant discounts, pricing the case (within reason) with the patient's limitations in mind. If a patient can afford X, we will work together to treatment plan optimal dentistry for X with an eye on what we can do next year or in the years that follow. Perhaps implants can be placed with locator attachments today, with incremental addition of implants that can be "upgraded" to a bar in the future. The goal of implant-supported fixed bridges can be a long term goal and, if



Figure 18. (Case 4) with a lower Locator overdenture: consisting of 5 locators and 2 metal copings made to retain the lower canines. Maintenance of the canines will preserve the bone in these future target implant sites for "upgrading" from an overdenture to a hybrid or fixed prosthesis in the future. This prosthesis is metal-reinforced to maintain strength.



Figure 19. Intraoral view of the implants placed with optimal A-P spread with locator attachments in place. The metal copings were made several years ago.



Figure 20. Postoperative smile view of completed upper denture and lower Locator-retained overdenture.

properly planned for and staged, can be attainable long-term.

I suggest meeting with multiple people to discuss goals, philosophies of care, and willingness to work with a patient prior to finalizing your implant team. Placing implants to preserve bone, as well as other treatment options, does not always occur to a dentist that isn't forward-thinking in terms of final treatment. In this economy, it isn't only the patients that are taking the hit financially, but the implant dentist as well. We must offer patients more than just dentures and partials, and involve them in their own care. Then we can utilize creativity, empathy, artistry, and comprehensive restorative dentistry skills to improve the lives of our patients. ♦

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References

1. Winter R. Upgradeable dentistry: Part 1. *Dent Today*. 2009;28:82-87.
2. Winter R. Upgradeable dentistry: Part 2. *Dent Today*. 2009;28:97-100.
3. Misch LS, Misch CE. Denture satisfaction—a patient perspective. *Int J Oral Implantol*. 1991;7:43-48.
4. Chan MF, Johnston C, Howell RA, et al. Prosthetic management of the atrophic mandible using endosseous implants and overdentures: a six year review. *Br Dent J*. 1995;179:329-337.
5. Payne AG, Solomons YF. Mandibular implant-supported overdentures: a prospective evaluation of the burden of prosthodontic maintenance with 3 different attachment systems. *Int J Prosthodont*. 2000;13:246-253.
6. Tang L, Lund JP, Taché R, et al. A within-subject comparison of mandibular long-bar and hybrid implant-supported prostheses: psychometric evaluation and patient preference. *J Dent Res*. 1997;76:1675-1683.
7. Federick DR, Caputo AA. Effects of overdenture retention designs and implant orientations on load transfer characteristics. *J Prosthet Dent*. 1996;76:624-632.
8. Tolstunov L. Combination syndrome: classification and case report. *J Oral Implantol*. 2007;33:139-151.
9. Carlsson GE. Responses of jawbone to pressure. *Gerodontology*. 2004;21:65-70.
10. Cabianna M. Combination syndrome: treatment with dental implants. *Implant Dent*. 2003;12:300-305.

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