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Upgradeable Dentistry- Part III

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Introduction

In part one and two of this four part series we have discussed "Upgradeable Dentistry" a concept that is particularly important in our current economy.

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 a dynamic process, not a static event. Too often in dentistry, the insurance companies' fee schedule becomes synonymous with treatment recommendation. If we educate our patients that dentures are not a destination but a stop along the path to reclaiming proper esthetics, 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]

In previous articles we discussed Turbyfill dentures as taught by Dr. Jack Turbyfill from his background with his mentor Dr. Earl Pound. We "Upgraded" this with the use of small diameter implants for retention of denture and partial denture prostheses. These were taught to the author by Dr. Ara Nazarian and discussed via interview with Dr. Charles English.

The next phase of treatment planning is to consider Overdentures and Hybrid 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 is debated in the literature, [4,5,6] but it is generally accepted that use of an overdenture will result in improved mastication, bone maintenance and nutrition over denture use alone.

Case 1

A woman presented to my office for treatment planning. She had been to a dentist who wanted her to spend $20,000 on the restoration of her maxillary arch with crowns and fixed partial dentures with the replacement of her lower complete denture. After assessing her medical history, desires and finances, we decided to restore her mandibular arch with symphyseal grafting and a lower hybrid prosthesis. In fact, after finishing our financial considerations we even had enough money left over to improve her maxillary esthetic 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 OVD or occlusal vertical dimension.

The starting point for most implant rehabilitation is the creation of a prototype restoration to test or evaluate the optimal final tooth positioning for lip line, phonetics, neutral zone creation and prosthesis design. Here 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. This is seen clearly in figure 3. In figure 4, the 5

Fig. 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 in Contemporary Implant Dentistry 3rd Edition by Mosby.

Fig. 2: With a height of 22mm 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.

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

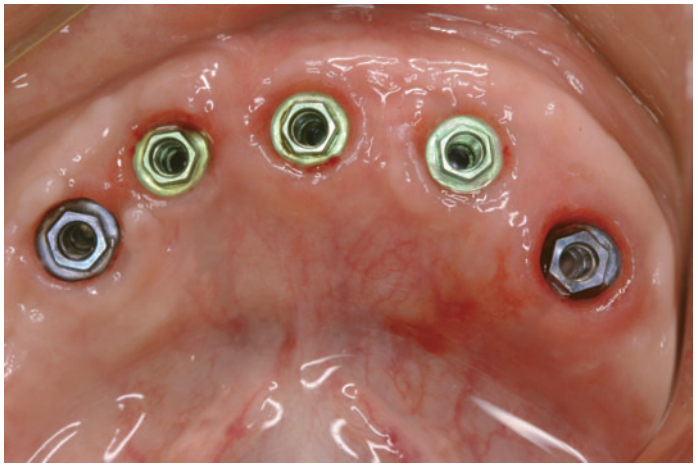

Fig. 4: Ideal implant placement of 5 BioHorizons Implants according to the ideal prosthesis driven placement. Note the adequate zone of attached gingival secondary to grafting and alloderm placement around the implants.

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

Fig. 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.

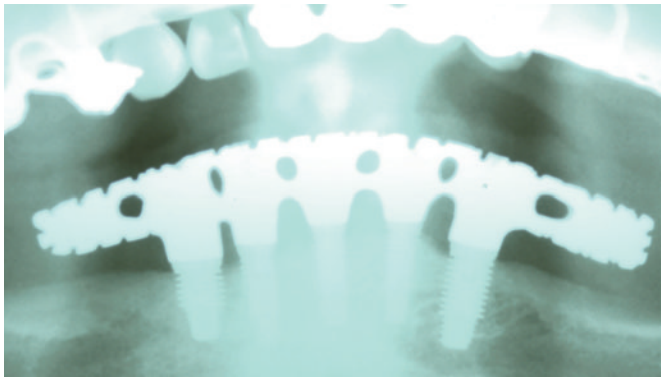

Fig. 7: The Panorex view of the completed prosthesis.

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

Fig. 9: Pre-operative view of patient's maxillary restorations.

Fig. 10: Post-operative smile displaying correct occlusal vertical dimension, golden proportion and overall final esthetic.

Fig. 11: Post-operative full face view of patient 3 years after hybrid delivery.

Bio-Horizons implants were placed in an ideal fashion with good A-P spread between the mental foramina.

The use of a Duralay jig in figure 5 is one way to verify accuracy of the impression. When the case is mounted a window can be left to visualize complete seating of the prosthesis on the implant analog as seen in figure 6.

The author will also do this with bar overdentures so model accuracy can be checked at time of intra-oral try-in of bar, hybrid, etc.

The Panorex-view as seen in 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.

The summary of this case can be seen from her pre-operative smile in figure 9 to her post-operative smile in figure 10 and full face smile in figure 11.

The reason this case is important is not necessarily the dentistry performed but the mind set needed to help this patient with her primary problem. The dentist that treatment planned her maxillary reconstruction without regard for her "rehabilitation" has missed the boat. Patients that see you as an advocate to solve their problems are your patients for life. They will certainly entertain your ideas for continual improvement.

Case 2

In patient number 2 we also began with a knife edged ridge. This ridge was leveled by osteoplasty and 4 BioHorizon's implants were placed between the mental foramina in the A,B,D,and E positions (Fig. 12). These correspond to the five 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 that fit intimately over the milled bar. Within the denture as seen in figure 13, two Bredent attachments (green) and 3 hader clips are embedded in the metal intaglio of the prosthesis. Note: the metal frame extends to the retromolar pads bilaterally and acrylic is left in contact with the edentulous ridge for better adhesion of future saddle relines. While we originally planned to upgrade her to fixed bridgework, she is satisfied with the comfort, biting forces and feel of the lower so is now pursuing an upgrade to her upper prosthesis.

She has been educated that she will continue to lose bone in the edentulous free-end saddle area but for now she has been allowed the dignity of chewing without a mobile denture. She has stability, support and comfort which have met all of her phase 1 goals. 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 denture 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 also have a concomitant flabby ridge in the premaxilla.

In the decision making process we must find out the patients' financial comfort level at present and over the next 3-4 years. Then we can help allocate these funds according to the patients' chief complaints and their greatest need. If the patient presents with partial dentures we must ask whether we can stabilize the bone in the free-end saddles. 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 needs as well as one of desires we can help them to prioritize their dental rehabilitation with mutual understanding.

Fig. 12: 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.

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

Fig. 14: Retracted view of upper denture with lower bar supported overdenture.

Case 3

This patient underwent extensive treatment as she had continually failing dentistry and she was tired of continual repair by her previous dentist. This dentist had treatment planned her for a laser "LANAP" procedure for $5,000 and a precision attachment partial. They didn't listen to the patient's 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 because of advanced periodontal disease. She didn't want to spend $50,000 and then worry that she would continue to lose teeth. She emotionally couldn't handle the trauma this would cause.

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

In figure 15 we see her now 5 year old bar supported overdenture. This bar was fabricated in two pieces, with a dovetail to decrease casting inaccuracies. It has 3 Bredent attachments and a full arch A-P spread for excellent stability, support and retention (Fig. 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 syndrome has been avoided. Treatment planning of an overdenture versus a fixed bridge is based on need for lip support, patient's psychogenic factors, reparability, cost, force factors to name some of the diagnostic criteria.

Fig. 15: Patient 3 with a 5 year post overdenture result prior to relining prosthesis.

Fig. 16: Maxillary 8 implant bar, fabricated in 2 pieces with a dovetail for seating and decreasing casting error.

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

Fig. 18: Patient 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.

Fig. 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.

Fig. 20: Post-operative smile view of completed upper denture and lower locator retained overdenture.

Case 4

The fourth patient had presented 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. Figure 19 shows the 5 locator attachments and 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 the treatment can be done in phases until completion. If they choose to place 2 implants a year for the next 3-4 years the vision will become a reality at the patient's pace.

These cases all highlight various aspects of dental care which have brought people to their next level. The treatment isn't completed until the patient has a result he/she is happy with.

Conclusion

When we discuss "UPGRADEABLE DENTISTRY" we also must realize that dentistry must be affordable. The cases I am highlighting in most of 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 to have a team that will work together to make this kind of dentistry affordable. My implant team will offer multiple implant discounts, we will price

the case with the patient's limitations in mind. So that 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 the years that follow. Perhaps implants can be placed with locator attachments today with incremental addition of implant which can be upgraded to a bar in the future. The goal of implant supported fixed bridges can be a long term goal which if 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.

In this economy it isn't only the patients that are taking the hit financially but the implant dentist as well. Placing implants to preserve bone as well as options often doesn't occur to a dentist that isn't forward thinking in terms of final treatment. 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 to improve the lives of our patients. TW

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