

In the ever-changing world of dental technology, the one segment that seems to be a mainstay in growth consistency is removables. Whether it is full dentures, partials, implant overdentures, or attachment overdentures, the potential for continued laboratory business growth in these areas is substantial. While growth opportunity is a major factor, the success factor for removable cases included in the areas mentioned includes many variables.

We are faced today with the demand of creating a denture that by far surpasses the esthetics and function of dentures that were made twenty years ago. Denture wearers want to look as if aesthetic natural dentition is taking up the oral cavity as opposed to the old mediocre look of denture teeth and acrylic or as I have heard it called “The Pink Smoothie”.

The good news is now the patient can get what he or she wants when it comes to function and high-end aesthetics. Successful high-end cosmetic dentures all start with good communication with the dentist and the patient and then it is combined with knowledge, technical expertise, and quality materials. But all of the above mentioned cannot be achieved without the appropriate occlusal scheme and the right attachment system.

Also, the following points listed are a must for a successful case:

- Case planning
- Accurate impressions
- Correctly contoured bite rims and accurate bite registrations
- A semi-adjustable or fully-adjustable articulator to mimic jaw function
- Precise denture processing

Occlusion and Attachments

The Underlying Scheme for Successful Overdentures

Dennis Urban, CDT

Let's start with case planning. Keep in mind that the most important objective here is patient satisfaction. Without patient satisfaction the dentist loses business; in turn the dental laboratory loses business and the patient suffers with an inadequate restoration. That is why it is so important to have quality communication between the dentist, the patient, and the laboratory technician. When it comes to case planning for implant cases, the ideal situation is to have the Oral Surgeon and if possible the Periodontist involved in the communication loop.

Unfortunately, many dental schools still do not train in depth about implant-supported overdentures. Numerous dentists still rely on condensed courses presented by implant companies. This is why knowledge, material science, and the expertise of the dental technician are so important.

A few of the factors for prescribing an implant overdenture for a patient are inadequate bone support, loss of alveolar ridge, and instability with fit and function on a tissue supported denture base. After a radiograph is done and the evaluation of bone quantity is determined, then the treatment for the patient is ready to begin. Let's utilize an attachment system that will allow us size options,



Fig. 1: Equator attachments for implants



Fig. 2: Equator attachments for castable sphere



Fig. 3: Low profile Equator vs. Locator

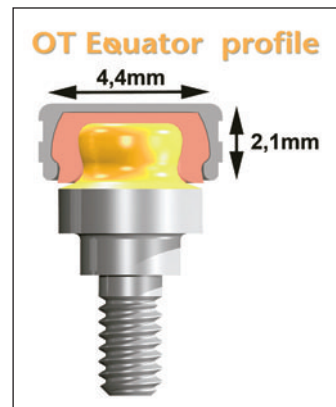


Fig. 4: Equator profile

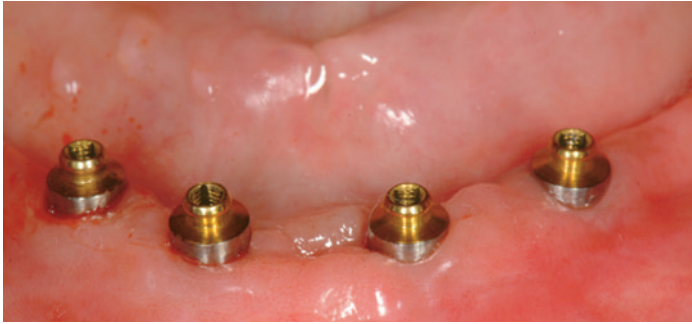


Fig. 5: After Implants have been placed

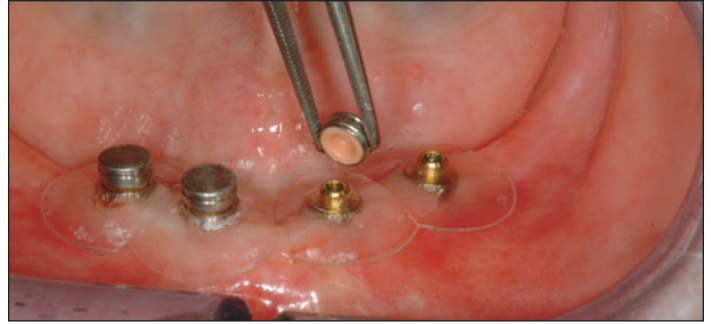


Fig. 6: Equator caps placed on implants



Fig. 7: Prepared denture for processing attachments

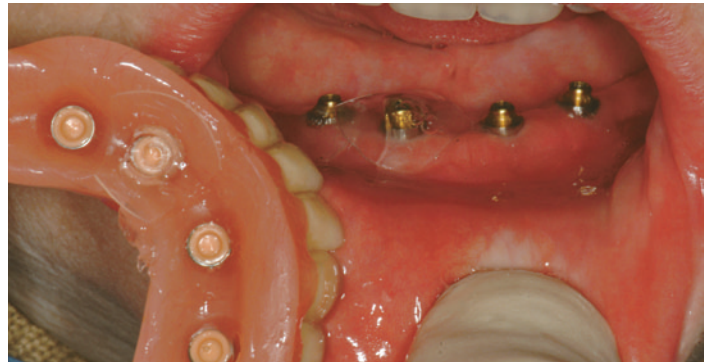


Fig. 8: Finished denture with equator attachments

retention choice, and quality. An excellent attachment of choice is Rhein 83. Rhein 83 offers a complete system of prefabricated components for planning and fabricating a successful and personalized case. The new OT Equator

offers a low profile and is compatible with all implant brands. In addition, the Equator offers optional castable components for the indirect system. (Figs. 1-8)



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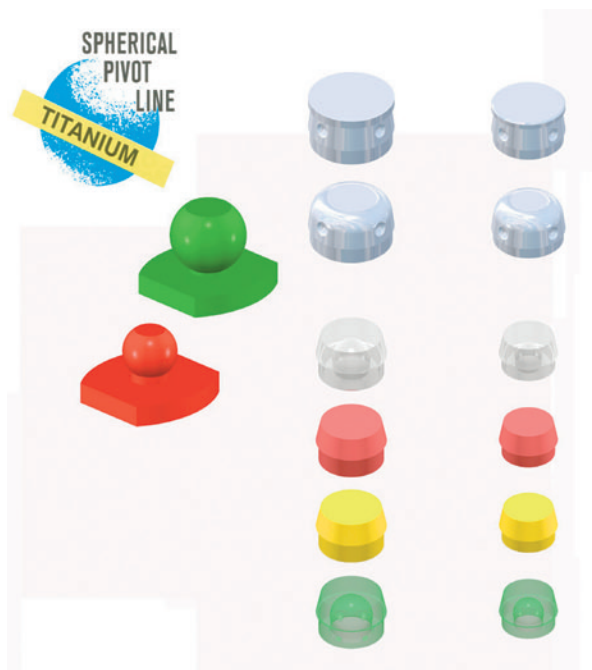


Fig. 9: Castable spheres with housings for soldering or curing in acrylic

CLASSIC CAPS RHEIN83			
SIZES AVAILABLE: NORMAL AND MICRO			
Different colors correspond to different retention degrees			
WHITE CAPS STANDARD RETENTION			Slightly elastic Maximum suggested time of duration in mouth: 12 months Retention in grams: Normal from 1200 to 1300 Micro from 1000 to 1100
PINK CAPS SOFT RETENTION			Elastic Maximum suggested time of duration in mouth: 12 months Retention in grams: Normal from 800 to 950 Micro from 750 to 850
YELLOW CAPS EXTRA SOFT RETENTION			Very elastic Maximum suggested time of duration in mouth: 12-14 months Retention in grams: Normal from 500 to 550 Micro from 450 to 500
GREEN CAPS			Characteristics: Extremely elastic retention, "GUMMY" type, A little bit hygroscopic, with a good adhesion on the sphere
GOLD CAPS SLIGHTLY ELASTIC			Characteristics: to be used in overdenture prostheses, where resilience and vertical movements are necessary Retention in grams: Normal from 450 to 500 Micro from 250 to 300
SILVER CAPS ELASTIC AND GUMMY			Characteristics: to be used in overdenture prostheses, where a vertical movement is necessary and a light initial retention is requested.
BLACK CAPS			Characteristics: Caps to be used only for laboratory process (economic), any retention on the sphere
TITAN CAPS			Characteristics: Nylon caps with an internal titanium ring. Long duration and to be used especially in combination with Pre-fabricated spheres, as titanium spheres, concave spheres, etc.

Fig. 10: Various retentive values



Fig. 11: OT Box placed on relieved model



Fig. 12: Sprued OT Box



Fig. 13: Finished OT Box casting

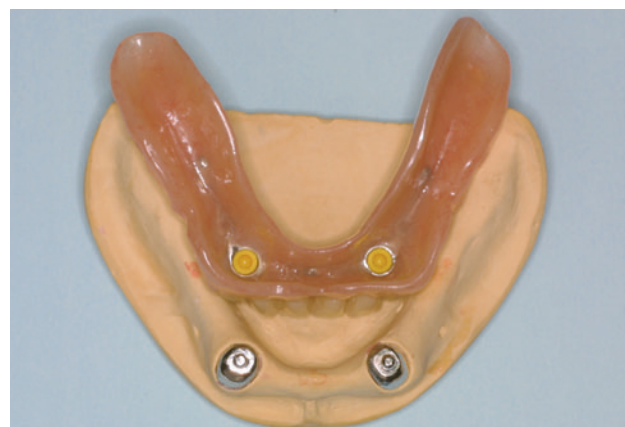


Fig. 14: Finished OT Box processed into denture



Fig. 15

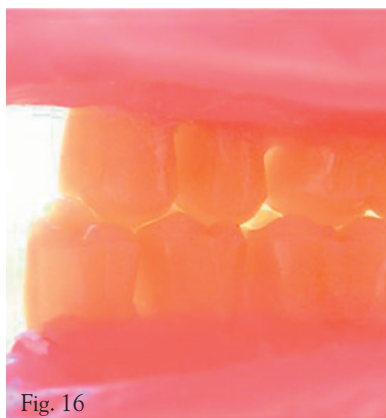


Fig. 16



Fig. 17

Figs. 15, 16 and 17: When setting Lingoform, make sure that the lower teeth are set first and that you maintain a Curve of Spee, but not a Curve of Wilson

The low profile feature enables the technician to utilize more space for an enhanced esthetic denture set-up. The additional space also provides more room for denture acrylic, which will in turn strengthen the denture.

When planning a case for a simple overdenture with single spheres, the OT cap is the perfect choice and they are available in 2.5 mm and 1.8mm (Normal and Micro). The caps also come in a variety of retentive values (Figs. 9, 10).

In an overdenture, the use of a sphere with a leveled head in conjunction with an elastic cap results in case stability with a minimum amount of trauma. Keep in mind that an overdenture made entirely from resin will be exposed to possible fracture. I recommend using a castable reinforcement bar called the OT Box. Any type of alloy can be used for the casting (Figs. 11-14).

Let's assume that you are ready to go to the denture tooth set up stage and all the prerequisites for a successful case have been met up until this point. You have received an accurate bite registration and are ready to proceed with the next step. The articulation system that I find the most user friendly and the most accurate is the ARTEX System by Jensen. A separate mounting articulator can be used to keep dust and debris from getting into places on the main Artex units used throughout the lab. The mounting units are calibrated and models can be accurately transferred to the working articulator.

The semi-adjustable Artex CR has an adjustable condylar inclination of -20° and $+60^{\circ}$, a radius of 19mm, and adjustable Bennett angle from $0 - 30^{\circ}$ including side shift functions and protrusion functions. It is designed to mimic realistic jaw movement and that is precisely what


you want when creating full mouth reconstruction and overdentures.

After the case is mounted and you have determined the mould of the anteriors, the most important part of the denture set up is going to come into play and that is the occlusal scheme. The scheme that works the best with implant overdentures is lingualized occlusion. What is lingualized occlusion? It is when the lingual cusps of the upper posterior teeth come in contact with the central fossa of the lower posteriors. Why is lingualized occlusion so important? Because the objective is to get the patient in the most ideal occlusal function while relieving the off axis stress on the alveolar and on an implant or attachment. The minimizing of lateral forces on implants and attachments lead to a denture with functional stability. All occlusal forces are directed to the crest of the ridge.

Years ago a higher degree of tooth was used on the upper posteriors such as 20° , while a lesser degree tooth was used on the lower such as 10° or 0° . The object was to still have the lingual cusp of the upper occlude with the central fossa of the lower. Today tooth companies sell specially designed lingualized teeth. Some are effective and some are not. Lingoform teeth by Vita satisfy both esthetics and function when utilizing lingualized occlusion. They are extremely easy to set and come in 3D shades (Figs. 15, 16, 17). Also keep in mind that the patient is spending a large amount of money on an overdenture case. We want to use a tooth that will wear like natural dentition and the wear factor on Vita teeth is phenomenal. They wear almost like natural dentition.

If all the steps required for a successful overdenture case

have been followed correctly and the doctor and patient are satisfied with the overdenture try-in, then we are ready to process and finish the case. Be sure to use a high impact acrylic with an accurate processing method such as the injection method of packing. To complete this high-end aesthetic overdenture, a denture base stain may be added for natural effects.

Obviously, there are some other factors that come into play for a successful overdenture case. We have covered some of the most important ones. Keep in mind; the patient is the one we have to please. Utilizing the best materials available, applying our expertise, and proper communication will inevitably yield to a successful case. 

About the author

Dennis Urban CDT has worked in the dental technology field for 35 years. He owned and operated a full service lab on Long Island, New York for many years.

He has lectured worldwide since 1985 on various areas of dental technology, including denture set ups, lingualized occlusion, denture processing, implant overdentures, occlusion, soft liners, infection control, and porcelain staining. His technical articles have been published numerous times in many dental publications in the U.S. and Canada.

Dennis Urban has been Vice President of both the Long Island Dental Laboratory Association and the Dental Laboratory Association of the State of New York. He was a Cal Lab board member and a delegate for the NADL.

He was the recipient of the 2007 NADL Excellence in Education award.

Dennis has been a Technical and Sales Director for various dental manufacturers and is now the Technical Consultant and Removable Manager for Drake Precision Dental Laboratory in Charlotte, NC.



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