

FOUR ANCHORS OF SUCCESS IN MANDIBULAR IMPLANT OVERDENTURES

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Stabilizing a patient's complete denture with implants is a great way to earn that patient's loyalty. The multitude of benefits that implant overdentures offer to the edentulous population is overwhelming, in improved function, emotional stability, physical health, and esthetics.

Proper evaluation and treatment planning of the fully edentulous patient has been shown to result in an improved quality of life for patients and predictable clinical success. Although there still remains a lack of consistency of techniques, prosthetic design, and attachment systems, these aspects have been proven less important to successful outcomes than once thought. Here is a brief conceptual guide to obtaining optimal results for your edentulous patients.

(1) Respect the Tradition

Any successful overdenture treatment begins with the understanding that only a stable, well-fitting complete denture can serve as a good implant overdenture. Thus traditional principles of full-denture fabrication principles must be respected. These include ideal border adaptation and extension and full-denture occlusion.

Proper articulation and denture tooth setup will allow evaluation of all parameters of final treatment success. A try-in of the proposed tooth setup is critical to determine ridge position relative to the proposed prosthesis before surgery. The try-in also allows evaluation of esthetics, phonetics, and support. And the setup also guides ideal implant position so that the implants emerge well within the confines of the denture.

The safest bet is to make a new CD and fit it for implant attachments. But if an existing denture is

available and determined to have adequate tooth position, this can become the surgical guide for implant placement. If a denture with adequate occlusal and esthetic parameters is not available, then the only way to avoid placement in a less-than-ideal or even non-usable position is to create a new ideal setup.

It is a good idea to duplicate the wax setup in clear acrylic before final processing to serve as a surgical guide. A clear surgical guide fabricated by duplicating the ideal setup ensures implant placement within the confines of the final denture base.

Proceeding with implant placement before trying in the tooth setup invites issues such as compromised space for overdenture attachments, compromised retention as a result of unexpected forces acting on the implant attachments, inadequate acrylic thickness, and unforeseen laboratory and component costs necessary to correct poor angulation. If you absolutely must use the existing CD, consider a new chair-side reline before beginning treatment.

(2) Do it by the Numbers

Traditional overdentures are classified as implant-retained and tissue-supported prostheses. So, while most patients will benefit tremendously from the two-implant mandibular overdenture, close evaluation of the residual ridge will provide information about the ideal number and position of implants, as well as abutment and attachment selection.

The standard of care is to place at least two mandibular implants. Due to the high quality of bone that is found between the mental foramina, the mandibular implants are usually placed there. However, if the patient's residual ridge is inadequate to provide the majority of vertical occlusal support in function (as in cases of extreme "knife-edge" or chronic mucosal soreness), then more implants or splinting of the implants may be indicated to provide more implant support and decreased loading of the tissues.

Placing three to four implants (as opposed to only two) provides the benefit of easing the load on a

less-than-ideal ridge, decreasing mucosal bearing areas during occlusal function. Similarly, if the patient's force factors are high due to bruxism or a strong bite, it is a good idea to place a third implant in between the first two for additional retention. Additional implants may also be more desirable when fixtures of reduced length or diameter are necessary because of limited bone volume. Finally, additional implants also will provide for decreased anterior-posterior movement (rocking) of the appliance. In lieu of a third implant, the best approach to limit A-P rocking is to place the two implants close together, roughly in the lateral incisor areas rather than spread out in the canine areas.

If it appears that more than four or five implants will become necessary, you should consider a fixed implant-supported prosthesis.

(3) Play Your Angle and be Resilient

The majority of overdenture complications and maintenance concerns relate to attachment adjustment and replacement, as well as fracture from the prosthesis. Through proper attachment selection and use of resilient attachments, these issues can be significantly minimized.

There are several attachments available to provide retention of the prosthesis to the implants, such as LOCATORS, O-rings, Hader clips and bars to name a few, and numerous studies have shown that many designs work well. But to select the optimal attachment, a number of case-specific factors should be considered.

Attachments are either rigid or resilient. Rigid attachments provide only a limited path of off-angle insertion because they restrict rotational movement. Resilient attachments allow varying amounts of rotation and angulation correction. If two implants are even minimally nonparallel, a resilient attachment will consistently show less friction, wear, and breakage, and is easier to use.

Some attachment systems, such as Locator, allow angulation correction of up to 20° per implant (40° between divergent implants) within a resilient

range. However, if the inter-implant angle discrepancy is severe enough (more than about 20°) that it would prohibit seating of the Locators, a bar attachment is the preferred solution, as it would zero out the angles and provide a clean slate for connecting other attachments.

Also consider each of these other factors in attachment selection, such as height of the attachment, which should minimize space required inside the denture (to decrease potential fracture caused by inadequate acrylic thickness) and housings with replaceable matrices. A housing for the attachment provides the benefit that, with any need to change the retentive component, it is not necessary to re-cure the attachment into the denture base.

(4) Practice Your Pick Up Skills

You can either incorporate the attachment into the denture chairside or you could take impressions and send everything to the lab for fabrication. The advantage of chairside "pick up" is that the attachment can be made in a passive, loaded (i.e., bite force) environment to ensure complete seating of the denture on the underlying tissues. This approach is more technically demanding but enables the incorporation of attachments into an existing denture, saves money and allows you to get a dynamic fit.

Laboratory attachment incorporation is less technique sensitive, but the Laboratory lacks the benefit of muscled attachments, lips, and functional movement and it does not account for the level of mucocompression necessary to ensure full seating on the tissues. With laboratory curing of the attachments, the attachment should be connected to the base plate before processing the denture at one of the wax rim or set-up try-in appointments.

Thankfully, techniques have been developed to simplify chairside incorporation. The most important priorities are to block out undercuts against inflow of acrylic (preventing removal of the denture) and to ensure that the prosthesis can fully seat on the tissues without interference with the attachments. To start incorporating chairside, Locators are the easiest place to begin.