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Implant-Retained-and-Stabilized Overdenture: Design Concept and Direct Pick-up Technique

In 2002, a group of distinguished scientists and clinicians met at McGill University in Montreal, Quebec, to discuss evidence-based restorative options for the edentulous mandibular arch.¹ After reviewing data from randomised clinical trials and epidemiological studies, the panel issued a landmark consensus statement identifying the mandibular overdenture stabilised by two implants as the first-choice standard of care for edentulous mandibles.¹⁻² Data presented at the symposium¹ and by numerous subsequent studies² have documented the ease of implementation and significant improvements in patient comfort, satisfaction and prosthesis stability provided by implant-stabilised overdentures compared to conventional dentures.

This article will briefly review the underlying principles and techniques for stabilising an overdenture with 2 AdVent® dental implants with Ball Abutments and Cap Attachments (Zimmer Dental Inc., Carlsbad, CA, USA).

DESIGN CONCEPT

One implant is placed in the mandibular symphysis region on each side of the midline and restored with a Ball Abutment. Retentive Cap Attachments are processed into the overdenture base and snap onto the Ball Abutments to retain and stabilise the overdenture [Fig. 1]. The underlying restorative goal is to maintain complete soft-tissue support of the prosthesis by allowing the overdenture to rotate freely on the resilient attachments. Placing more than 2 implants with similar attachments reduces or eliminates the rotational movements of the overdenture on the Ball Abutments and may transfer undesirable fulcrum-type stresses to the implants themselves. This could result in implant overloading. If left untreated, implant overload can cause progressive peri-implant bone loss and eventual component fracture.

Each retentive Cap Attachment provides five

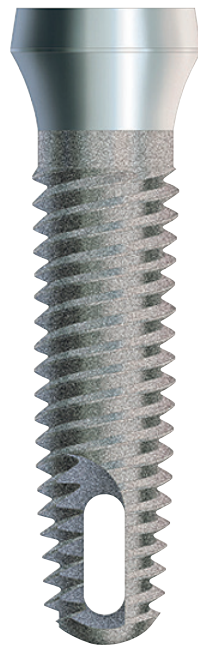


Figure 1. Restorative components include the implant, Ball Abutment and Cap Attachment assembly.

pounds of retention when snapped onto the Ball Abutment. This retention can also be decreased to meet the needs of individual patients. Absolute parallelism of the Ball Abutments is not necessary because the Cap Attachments can be attached to their respective Ball Abutments, then rotated to create a common path of draw with one another prior to pick-up in the denture base. Cap Attachments consist of a retentive nylon liner and a metal housing. When the nylon liners wear out, they can be removed from the metal housings and replaced with new liners without having to reline the overdenture. Guidelines for this type of restoration are summarised in Table 1.

DIRECT PICK-UP TECHNIQUE

After implant placement, osseointegration, and release by the dental surgeon, the patient may be reappointed to begin restorative procedures. The tops of the implants will be visible and located slightly above the soft tissue, and the surrounding gingiva should appear healthy and fully mature. The dental surgeon may have relieved the patient's existing denture and placed a soft liner to prevent impingement of the implants during the postoperative healing period. Healing screws (or healing screws with height extenders) will have been placed into the tops of the implants. At this time, the healing screws should be unthreaded and removed with a 1.25 mm- diameter hex tool.

Ball Abutments are one-piece components that consist of a male ball that rises above a 1-mm-high collar, and a threaded shaft that screws directly into the implant [Fig. 1]. For optimum functioning, the top of the Ball Abutment collar should be approximately 1 mm above the highest point of the soft tissue; however, it is important to keep the abutment height as low as possible in order to decrease the lever-arm effect applied to the implants by the tissue-supported overdenture. When additional height is needed, the 2 mm height extender can be used with the Ball Abutment to obtain 3 mm of vertical height from