

Implant Overdenture Attachments: Well-known Trade Names and Basic Types

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A conventional complete denture is a widely used treatment for edentulous patients. However, lack of retention and stability results in a decrease in chewing ability in these patients.¹ Alfadda² studied the relationship between various parameters of the complete denture quality and patients' satisfaction and concluded that a clinically stable mandibular denture was the most important determinant of patients' satisfaction. Implant-retained overdenture is one of the most popular and well-established treatment strategies.^{3,4} Type of attachment plays an influential role in maintaining the long-term success of the implant overdentures. There are four basic groups of attachment systems exist:^{5,6}

- Splinted
 - Bar
- Unsplinted or free-standing
 - Stud
 - Magnetic
 - Telescopic

The bar attachments are made up of casted or milled metallic bars joining two or more implants and the retentive components usually holding corresponding flexible clips incorporated into the dentures with the help of metal housings. They provide splinting effect to all the implants, however, require more technical and clinical expertise to use. Their use remains limited in less inter-arch space.^{7,8} In patients with a decreased vertical dimension or reduced vertical restorative space, the unsplinted or free-standing attachment systems are used over splinted (bar-clip) type and are also beneficial in terms of the initial treatment cost, hygiene, and simplicity in the clinical usage when compared with the splinted bar-type of attachments.^{7,8}

In recent years, different stud attachment designs have been introduced as opposed to the conventional ball designs and are being named (and known) by their trade names [Locator (Zest Anchors), Equator (Rhein83), and ERA (Sterngold)] rather than their basic category of the "stud attachments".⁵⁻⁹ These newer designs have a single common characteristic feature of their ability to accommodate the limited inter-arch space and hence also referred to as low-profile attachments.⁸ The Locator (introduced in 2001 by Zest Anchors) was one of the most widely used and studied systems accommodates as low as 2.5 mm vertical height.⁸⁻¹⁰ The Equator (introduced by Rhein83) was a similarly designed newer low-profile stud attachment providing both castable and direct options for implant overdentures which requires as low as 2.1 mm vertical height.¹⁰ The clinical performances of these overdenture attachments were well reported.^{11,12}

Baskaradoss et al.¹¹ carried out a systematic review on 17 studies to evaluate the effects of different types of attachments, implant numbers, and loading protocols on the peri-implant mucosa in patients using implant overdentures. They concluded

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that no attachment type (splinted bar type or unsplinted stud type) and implant number (2 or 4) have a clear advantage over the other. Delayed loading protocol, however, was observed to be advantageous over immediate or early loading protocols. Implant designs are also one of the influential factors in the long-term success of implant therapy. Cehreli et al.¹² performed a systematic review to evaluate the effects of implant design and attachment type on marginal bone loss in implant-retained/supported overdentures with a total of 4,200 implants from 13 manufacturers and concluded that there was no difference in marginal bone loss around implants retaining/supporting mandibular overdentures relative to implant type or attachment designs.

The clinician should be mindful of the basic types of the implant overdenture attachments to be used in a specific clinical situation and should not get puzzled by the "trade names" of the "stud attachments" rigorously being marketed by the manufacturers.

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