

Review Article

Attachment Types for Implant Supported Over Dentures

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ABSTRACT:

The present review focuses on maxillary and mandibular implant-supported overdentures. For edentulous patients Conventional complete dentures were familiar treatment modality. In any case, the appearance of implant-supported overdentures has supplanted regular dentures as a superior standard for recovery. To enhance the achievement rate of implant-supported overdentures, watchful case choice is an essential basis. Further research should be directed to enhance the accomplishment implant-supported over dentures.

Key words: Attachments; implant; edentulous ridge; over dentures

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Introduction

Edentulous patient is viewed as poor in health and edentulism may trade off personal satisfaction. The prosthetic administration of the edentulous patient has for quite some time been a noteworthy test for dentistry.¹ The traditional treatment plan for the edentulous patient is the customary complete removable maxillary and mandible denture. Nonetheless, this treatment has a few disadvantages uniquely that of the lower denture.² Treatment of edentulous patients with implant-retained removable prostheses has been appeared to give an anticipated and effective result that conquers the practical insufficiencies that are related with ordinary dentures.³ Different sorts of attachment frameworks had been proposed for holding implant supported over dentures including stud (ball and socket, locator), bar, telescopic and magnetic attachments. All these kinds of dock frameworks had diverse retentive limits.⁴ In this way; the present investigation is intended to consider different implant attachments.

Implant-supported Overdenture

Dental implant is a prosthetic gadget made of alloplastic material embedded into the oral tissues underneath the mucosal and periosteal layer, and on or inside the bone for retention and backing for a settled or removable dental prosthesis; a substance that is put into the jaw bone that remains to be worked out a settled or removable dental

prosthesis. Overdentures enhance phonetics of patient, mental standpoint of patient and personal satisfaction. Patient discovers implant supported overdenture essentially increasingly steady and rate their capacity to bite a wide assortment of food as fundamentally less demanding, this enhances the sustenance state. implant-supported over dentures may decrease the amount of soft-tissue cover age and expansion of the prosthesis which is particularly imperative for new dentures or the individuals who have low gagging thresholds, less bone resorption, more prominent prosthesis dependability, better aesthetics and enhanced maintenance.⁵

Implant Loading

As per time of loading Implants can be classified into: Delayed implant loading and immediate implant loading.

A-Delayed Implant Loading

Conventional implant treatment protocols included the position of implants followed by a recuperating period of three to six months in a submerged or nonsubmerged placement. These periods were important to take into consideration for complete osteogenesis and woven bone remodelling into load-bearing lamellar bone prior to any occlusal loading.⁶ The detriments of delayed implant loading is the need to evacuate the conventional denture about fourteen days after implant placement to promote healing. Along with postoperative changes in the soft

tissues during the healing period discomfort can occur and often necessitates frequent prosthesis adjustment. Besides, extra medical procedure to uncover implant fixtures is another drawback of the delayed loading protocol.⁷

Immediate implant loading

Implant placement and prosthetic loading for edentulous patients at the equivalent clinical visit or isolated by two to about a month was proposed.⁸ This methodology was essentially connected in the mandible where excellent primary implant stability can be achieved in the interforaminal region.⁹ The upsides of immediate loading are: the positive effect on bone response; reduced numbers of visit, observing implants during healing and cost effectiveness are seen here.¹⁰ Disadvantages of immediate loading is that This methodology cannot be applied to every implant patient. The principle disadvantage of this method is the risk of implant failure with numerous appointments to remove the implant, graft bone and supplant new fixture.¹¹

Determination of a sufficient ISO attachment

Clinicians have chosen distinctive attachment systems durability, patient demand, cost effectiveness, technical simplicity, and retention. Attachments can be characterized relying upon its capacity as a) rigid, if they do not allow any denture dislodgements, or b) resilient, when they allow translation, rotation, axial or hinge over posterior axes movements or a mixture of them because of their flexibility. With rigid attachments, the implant will get 100% of occlusal load, while with resilient attachments; occlusal burden will be upheld by implant, denture or fibromucous. At present, the most utilized connections are discussed below:¹²

“O” Ring or Ball attachment

Attachment that is considered least difficult is ball attachment for clinical application with tooth or implant supported over dentures. It consists of a screw-retained male abutment in the implant having spherical shape on its occlusal portion, and a prosthetic anchored female part that can be metallic or covered with nylon with an alternate retention range. These attachments needn't bother about a great prosthetic space and they permit hinge and rotation dislodgements. Be that as it may, the particular design of the ball attachment may impact the amount of free movement thereby limiting its resiliency. Nonetheless, these attachments cannot be utilised with non-parallel implants.¹³

Magnetic attachment

Basically, they comprise of one magnet appended to the denture and another to the implant. They comprise a simple and comfortable framework for the patient as magnet attraction guides the denture insertion. Then again, they have a flimsier lateral stability and retention in comparison with mechanic attachments as ball or bar devices. In addition, they are susceptible to corrosion by saliva, explaining why they are clinically less often

used.¹⁴ However, a new generation of rare-earth magnetic attachments could improve their properties and be clinically more often utilized These new attachments may even now be a useful treatment option for edentulous patient with weak muscle disease such as Parkinson's disease patients, because they not only keep the denture stable, but also need less force to insert and remove the denture.¹⁵

Bar attachment

Bar consists an astounding anchorage system gives more noteworthy retention, enabling better force balance by its splinting effect and it can also correct severe unparalellisms. The retention components or clips are exchangeable and can be reactivated. The primary detriments of bar attachments are the need for a large prosthetic space and the risk of mucositis due to inadequate oral hygiene under the bar. Bars should be parallel to the rotation axis, be straight and be positioned 1-2 mm to the alveolar crest. There are some unique bar designs as Ackermann Bar (spherical shape), Dolder Bar (ovoid or “U” shape) and Hader Bar (keyhole shape). Also, there are implant-supported milled bars over dentures. They are bars with precision attachments and rigid anchorage, made by casting, electro erosion or CAD/CAM.¹²

Locator attachment

The male part comprise of an implant screw-metallic abutment and the female part of a metallic cap lined with nylon of various hues relying upon their retention capacity, which is tied down to the denture.^{16,17}

Telescopic attachment

Telescopic crowns are also called as a double crown, crown, and sleeve coping. These crowns comprise of an internal or primary telescopic coping, permanently cemented to an abutment, and a congruent detachable outer or secondary telescopic crown, rigidly connected to a detachable prosthesis.^{17,18} These retainers give fantastic retention coming out because of frictional fit between the crown and the sleeve.¹⁹ They additionally give better force distribution due to the circumferential relation of the outer crown to the abutment which makes the axial transfer of occlusal load that produce a less rotational torque on the abutment by improving the crown root ratio so preserving the tooth and alveolar bone.²⁰

Peri-implant findings and prosthetic complications

Evaluation regularly incorporates plaque index, bleeding index, probing depth, amount of keratinized attached mucosa and marginal bone level, and possible exudation of peri-implant pockets is recorded whenever seen. There are different opinions with respect to the significance and impact on periimplant health of a zone of keratinized attached mucosa encompassing dental implants. It has been accounted that healthy marginal mucosa around implants could be accomplished in good oral hygiene conditions likewise in situations when no keratinized mucosa is present.^{21,22}

Complications seen with implant overdentures are generally biological and technical or mechanical and more mucosal hyperplasia has been noticed with bars than with ball attachments. It has been supposed that an insufficient space beneath the bar—which prevents proper cleaning—may cause a soft-tissue inflammatory response under the bar attachment. Another reason for mucosal hyperplasia with bars could be the less precise settling of the denture base to the mucosa compared with ball overdentures.²³ Periimplant mucositis is rather often seen around implants. The incidence (an average of 19 %) associated with implant overdentures is greater than with fixed implants.²⁴ The most common technical complications with implant overdentures are loosening of the retentive mechanism, usually seen in about 30 % of cases.²⁵ In addition, fracture of the retentive anchor, occlusal screw loosening with bars, fracture of the acrylic base material or broken teeth and fractured bars are common findings. Resilient attachments were observed to more frequently have broken, loose, or lost female parts and a need for repairs and relining of the denture base, whereas rigid bar attachments more typical need tightening of the bar retainers.²⁶ It has been shown that attachments wear over time and lose their retention force. A rigid milled bar attachment on four-implant overdentures has been shown to cause less prosthetic maintenance compared with resilient denture attachments with ovoid bars.²⁷

Conclusion

To enhance patient quality of life, careful case selection should be incorporated for the Success of implants supported overdentures. Further research should be led to enhance the accomplishment for implant-supported overdentures. Picking the attachment systems for the implant overdentures must contemplate long term results concerning retention, stability, mechanical complications, and selection criteria related to the number, inclination of implants, prosthodontic conditions, the dexterity of the patient, biological conditions, and therapeutic expectations, financial and time resources of the patients, overall costs and usage technique.

References

1. Abu-Hussein M., Abdulgani A., Bajali M., Chlorokostas G.; The Mandibular Two-Implant Overdenture. *Journal of Dental and Allied Sciences*. 2014;3(1)58-62.
2. Abdulgani Azzaldeen, Bajali Musa, Kontoes Nikos, AbuHussein Muhamad. Atrophied Edentulous Mandible with Implant-Supported Overdenture; A 10-year follow-up. *Journal of Dental and Medical Sciences*. 2015;14(12):114-121.
3. Wennerberg A, Albrektsson T. Current challenges in successful rehabilitation with oral implants. *J Oral Rehabil*. 2011 Apr;38(4):286-94.
4. Pera P, Bassi F, Schierano G, Appendino P, Preti G. Implant anchored complete mandibular denture: evaluation of masticatory efficiency, oral function and degree of satisfaction. *J Oral Rehabil*. 1998 Jun;25(6):462-7.
5. Misch, C.E. An organised approach to implant-support overdenture. In: Misch, C.E. *Contemporary Implant*

- Dentistry* (3rd ed.). St Louis, Mo: CV Mosby; 2008: 293-313.
6. Adell R, Eriksson B, Lekholm U, Branemark PI, Jemt T. Longterm follow-up study of osseointegrated implants in the treatment of totally edentulous jaws. *Int J Oral Maxillofac Implants*. 1990;5: 347-3.
7. Abu-Hussein M, Azzaldeen A, Aspasia SA, Nikos K ; Implants into fresh extraction site: A literature review, case immediate placement report. *J Dent Implant* 2013;3: 160-164.
8. Azzaldeen Abdulgani, Nezar Watted, Muhamad AbuHussein: Implant-supported restorations in the anterior region. *IOSR Journal of Dental and Medical Sciences* 02/2016; DOI: 10.9790/0853-1508096966 .
9. Chlorokostas George, Abu-Hussein Muhamad, Abdulgani Azzaldeen: Immediate loading with mini dental implants in the fully edentulous mandible. *Journal of Dental and Medical Sciences* 01/2016; DOI: 10.9790/0853-15187179
10. Abu-Hussein M, Georges C, Watted N, Azzaldeen A ; A Clinical Study Resonance Frequency Analysis of Stability during the Healing Period. *Int J Oral Craniofac Sci*. 2016;2(1):65-71.
11. van Steenberghe, D., Molly, L., Jacobs, R., Vandekerckhove, B., Quirynen, M., & Naert, I. The immediate rehabilitation by means of a ready-made final fixed prosthesis in the edentulous mandible: A 1-year follow-up study on 50 consecutive patients. *Clinical Oral Implants Research*. 2004;15(3):360-365.
12. Muhamad AH, Georges C, Azzaldeen A. Implant-supported overdentures: clinical review. *IEJDTR*. 2017;6(2):403-411.
13. Abu-Hussein M., Abdulgani A. Mandibular implant overdenture retained with o-ring ball, *Int J Dent Health Sci* 2014;1(6):984-991
14. Tokuhisa M, Matsushita Y, Koyano. In vitro study of a mandibular implant overdenture retained with ball, magnet, or bar attachments: comparison of load transfer and denture stability. *Int J Prosthodont* 2003;16(2): 128- 134.
15. Alqutaibi AY, Kaddah AF. Attachments used with implant supported overdenture. *Int Dent Med J Adv Res*. 2016;2:1-5.
16. Stevens PJ, Fredrickson EJ, Gress ML. *Implant Prosthodontics: Clinical and Laboratory Procedures*. St Louis, MO: Mosby Inc.; 2000.
17. Alsiyabi AS, Felton DA, Cooper LF. The role of abutment attachment selection in resolving inadequate interarch distance: A clinical report. *J Prosthodont* 2005; 14:184-9 33.
18. Klemetti E, Chegade A, Takanashi Y, Feine JS. Two implant mandibular overdentures: Simple to fabricate and easy to wear. *J Can Dent Assoc* 2003; 69:29-33.
19. Langer Y, Langer A. Tooth-supported telescopic prostheses in compromised dentitions: A clinical report. *J Prosthet Dent* 2000; 84:129-32.
20. Keller U, Haase C. Care of edentulous mandible with implant stabilized telescope complete denture. *ZWR* 1991; 100:640-4.
21. Mai A, Azzaldeen A, Nezar W, Chlorokostas G, Muhamad AH; Extraction and Immediate Implant Placement with Single-Stage Surgical Procedure: Technical Notes and a Case Report. *J Dent Med Sci*. 2016;15: 95-101
22. Abdulgani Mai, Abdulgani Azzaldeen, Watted Nezar, Chlorokostas Georges, Abu-Hussein Muhamad; Extraction and Immediate Implant Placement with Single-Stage Surgical Procedure: Technical Notes and a Case Report *Journal of Dental and Medical Sciences*. 2016;15(11):95-101,

23. Naert I, Alsaadi G & Quirynen M. Prosthetic aspects and patient satisfaction with two-implant-retained mandibular overdentures: a 10-year randomized clinical study. *Int J Prosthodont* 2004;17(4):401–410.
24. Goodacre CJ, Bernal G, Rungcharassaeng K. Clinical complications with implants and implant prostheses. *J Prosthet Dent*. 2003; 90(2): 121–132.
25. Andreiotelli M, Att W & Strub J ; Prosthodontic Complications with Implant Overdentures: A Systematic Literature Review. *Int J Prosthodont*. 2010;23(3): 195–203.
26. Dudic A & Mericske-Stern R. Retention mechanisms and prosthetic complications of implant-supported mandibular overdentures: long-term results. *Clin Implant Dent Relat Res*. 2002; 4(4): 212–219.
27. Weinländer M, Piehslinger E & Krennmair G; Removable implant-prosthodontic rehabilitation of the edentulous mandible: five-year results of different prosthetic anchorage concepts. *Int J Oral Maxillofac Implants*. 2010; 25(3): 589–597.

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