Implant-based overdenture: A review in patient perspective

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ABSTRACT
A review in affected person’s attitude in abstract care of edentulous patients has to be a priority in elderly individuals. The development of complete dentures (CDs) has been the selection of remedy retaining in mind the socioeconomic popularity, age, and nutritional elements. However, most of the patients complain of loss of retention in mandibular implant-supported overdentures (ODs), which compensated the downside of the loss of retention in complete dentures (CDs). Moreover, implant supported over dentures (ISOVDs) supplied accurate exceptional of lifestyles, esthetics, progressed nutritional deficiencies, and provided good patient satisfaction. The place of dental implants and desire of retentive attachments for implant supported mandibular over dentures (ISOVD) are selected on clinician preference and professional opinion. This text offers a fundamental statistics regarding implant placement, mode of treatment to be selected, and patient care. Two implants provide extraordinary long-term achievement and survival with improved oral capabilities. Single midline implant OD is costly, powerful, and may be a promising alternative. In maxilla, 4–6 implants splinted with bar have located to give true results.

KEY WORDS: Abutment, bar attachment, ISOVD, stud

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Literature Overview [Figure 1]

Tooth loss is a main problem, and the WHO described edentulism as a shape of bodily impairment, the loss of all tooth causes a disability for most people who wear conventional dentures as they may have difficulty in performing two essential tasks; eating and speaking.[4] Quality of life (QOL) is defined as an individual's perception of their position in life, in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns.[5]

We must take into consideration the QOL as a major concern to evaluate the disease impact and the treatment efficacy. QOL is measured in terms of sociodental indicators.[6] Psychologically, edentulism reduces self-belief, taboo, and the sensation of untimely aging.[7] Pathological consequences are on bone leading to resorption, which poses a quandary for prosthetic substitute. Consequently, maintaining enamel and supplying OD preserve bone even in adjoining regions. Mericske-Stern[8] concluded that there is a higher charge of fulfillment in mandible when ODs are supported by the way of implants as opposed to teeth roots. Redford et al.[9] tested and revealed that more than 50% of the complete denture (CD) wearers have retention and stability troubles, which lead to patient pleasure, confidence, and comfort. Morais et al.[10] found that patients provided with an ISMOVD reported an increased ability to bite, eat and chew, without losing their dentures, 6 months posttreatment. In terms of biochemical modifications, serum albumin concentration increased by 1.4 mg/dl and serum B12 additionally improved.[11] Enhancement of esthetic look and facial morphology via replacement of misplaced difficult tissues may be proven simpler, if no longer more effective, with detachable OD in place of traditional fixed prosthesis, with possibly decreased costs and much less surgical intervention.

Bone Loss in Residual Ridges

Following teeth extraction, the alveolar process is reduced because of bone loss. With time, majority of people ought to depend on CDs, wherein bone loss needs to be considered [Tables 1 and 2].

Maxillary versus Mandibular Implant-supported Overdentures

Implant ODs in maxilla have not been as success as in mandible because the maxillary implant ODs had been made as a rescue treatment while constant prosthesis has failed. The recommended procedure is to apply four or extra implants splinted with a bar machine, it may be a success choice. A mandibular implant OD on two implants is a well-established and powerful alternative in long-term perspective.[13] Regarding retention, they are labeled into splinted and unsplinted ones, in which interconnecting bars and retentive clips are used for splinted device and lots of which include ball attachments and magnets are used or unsplinted.[14] Early loading implants at 6 or 2 weeks had been an powerful remedy and shows the same consequences as traditional loading.[15] Regarding financial system, the traditional CD is the cheapest accompanied by using implant OD, fixed supported prosthesis. To lessen the price, a remedy of mid-line implant has been attempted to hold a mandibular implant OD. While in comparison with ODs using 4 implants and 2 implants, the previous one is more costly and much less aftercare over 8 years.[16] In fact, the proportion of implant ODs to fixed implant-supported prostheses regarding implant treatments of the edentulous mandible varied from 12% in Sweden to 93% in the Netherlands.[16] In Korea, the percentage was approximately 50%. Size and curvature of mandibular arch and type of attachment are the elements which have an impact on the space between implants. Ideal length is 20–22 mm to accommodate two clips or riders. If two implants are placed near together, a quick bar cannot provide sufficient retention and stability for ODs. If Implants are placed way apart it will instantly interfere with tongue space and growing issues in fabricating the prosthesis.

Table 1: Elements for bone loss in residual ridges[12]

| Do not extract all teeth |
|-------------------------|
| Preserve a few teeth for overdentures |
| Place implants for implant-supported overdenture |
| Optimize patients’ nutrition and health |
| Optimize dentures |
| Ask patients not to use denture always |

Table 2: Prevention of bone loss[12]

| Factors of possible importance for bone loss in residual ridges |
|-----------------|-----------------|
| Age/sex          | Duration of edentulism |
| Facial morphology | Number of dentures worn |
| Nutrition and health | Denture-wearing habits |
| Medication       | Denture quality |
| Osteoporosis     | Oral hygiene |
| Systemic disease | Occlusal loading |

Figure 1: (a-c) Normal anatomy (no tooth loss), bone begins to recede after the loss of teeth, bone loss continues without intervention
**Stud Attachment**

Stud attachments offer reasonable retention and balance for implant ODs. Standards for stud attachment alignment include: (1) Stud attachments with each other have to be parallel, (2) should no longer intervene with the direction of insertion of OD, and (3) decide upon shorter attachments [Table 5]. [19]

**Locator Overdenture Attachment**

It was designed for the ease of insertion and removal, twin retention, a low vertical profile, and a unique potential to pivot. [18]

**Bar Attachments**

Type IV gold is used to prefabricate bar attachments. A low-fusing solder is used to solder the prefabricated Type IV gold attachments to the abutments. Different types are castable, premilled plastic pattern, which are available in 0.2° and 4°. [21]

**Complications**

Wrong angulations, improper implant location, too close, too far apart, and lack of communication are due to poor treatment planning. Problems during procedure lead to poor stability, mechanical complications, mandibular fractures, and ingestion/aspiration. Anatomy-related issues pose cortical plate perforation, sinus perforation, nerve injury, and bleeding. [16]

**Conclusion**

It can be concluded that edentulous patients restored with implant-supported maxillary or mandibular ODs, in preference to CD with or without postpalatal seal, experience extra satisfaction with the prosthesis, have better masticatory ability, psycho-social component will be stepped forward, and the QOL (first-rate of life) of the patient will be improved. QOL in regards to oral fitness in edentulous mandible two implants’ ODs offer great long-term survival including affected person pleasure, stepped forward oral function, and oral fitness. Understanding the educational background and culture plays a pivotal position in patients’ reputation, Hence the treatment selection should be patient and dentist friendly in addition to economical maintenance. [21]

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There are no conflicts of interest.

**References**

1. Bhagat TV, Walke AN. Telescopic partial dentures-concealed technology. J Int Oral Health 2015;7:143-7.
2. McDermott IG, Samant A. An overview of removable partial overdentures. Compendium 1990;11:106, 108-12.
3. Nallasamy D. Text Book of Prosthodontics. Pune: Jaypee Brothers Medical Publishers (P) Ltd.; 2006. p. 610.
4. The World Health Organization. International Classification of Functioning, Disability and Health: ICF. Geneva: World Health Organization; 2001.
5. Study protocol for the World Health Organization project to develop a quality of life assessment instrument (WHOQOL). Qual Life Res 1993;2:153-9.
6. Locker D. Disability and Disadvantage: The Consequences of Chronic Illness. London: Tavistock Publications; 1983.
7. Fiske J, Davis DM, Frances C, Gelbier S. The emotional effects of tooth loss in edentulous people. Br Dent J 1998;184:90-3.
8. Mericske-Stern R. Overdentures with roots or implants for elderly patients: A comparison. J Prosthodont 1994;72:543-60.
9. Redford M, Drury TF, Kingman A, Brown LJ. Denture use and the technical quality of dental prostheses among persons 18-74 years of age: United States, 1988-1991. J Dent Res 1996;75:714-25.
10. Morais JA, Heydecke G, Pavluk J, Lund JP, Feine JS. The effects of mandibular two-implant overdentures on nutrition in elderly edentulous individuals. J Dent Res 2003;82:53-8.
11. de Jong N, Chin A Paw MJ, de Groot LC, de Graaf C, Kok FJ, van Staveren WA. Functional biochemical and nutrient indices in frail elderly people are partly affected by dietary supplements but not by exercise. J Nutr 1999;129:2028-36.
12. Carlsson GE. Implant and root supported overdentures – A literature review and some data on bone loss in edentulous jaws. J Adv Prosthodont 2014;6:245-52.
13. Feine JS, Carlsson GE, editors. Implant Over Dentures. The Standard of Care for Edentulous Patients. Chicago: Quintessence; 2003.
14. Naert I. The influence of attachment systems on implant-retained mandibular over dentures. In: Feine JS, Carlsson GE, editors. Implant Over Dentures. The Standard of Care for Edentulous Patients. Chicago: Quintessence; 2003. p. 99-109.
15. Wismeijer D, Stoker GT. Comparison of treatment strategies for implant over dentures. In: Feine JS, Carlsson GE, editors. Implant Over Dentures. The Standard of Care for Edentulous Patients. Chicago: Quintessence; 2003. p. 61-70.
16. Carlsson GE. Distribution of the use of implant over dentures (IODs) and fixed implant-supported prostheses (FISPs) for implant treatment of edentulous mandibles in 10 countries. J Adv Prosthodont 2014;6:245-52.
17. Shafie H. Principles of attachment selection for implant-supported over dentures and their impact on surgical approaches SROMS. Vol. 19. Selected readings in oral & Maxillofacial surgery 2011.
18. Pavlatos J. The root-supported overdenture using the Locator overdenture attachment. Gen Dent 2002;50:448-53.
19. Session 5: Implant FPD lecture slides, 2003.
20. Misch K, Wang HL. Implant surgery complications: Etiology and treatment. Implant Dent 2008;17:159-68.
21. Cristache CM. OHDIMBC. Vol. V-No 3; September, Oral And Health Care Management; 2006.
22. Brewer AA, Morrow RM. Overdentures 2nd ed. St. Louis The CV Mosby Co; 1980. p. 347.