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## REVIEW ARTICLE

# COMPARING MANDIBULAR, 2IMPLANT SUPPORTED OVERDENTURE AND CONVENTIONAL MANDIBULAR COMPLETE DENTURE ON THE BASIS OF PATIENT COMPLIANCE AND COST FACTOR: A SYSTEMATIC REVIEW

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### ABSTRACT

**Background:** Change is inevitable. Considering the technological advancements taking place in dentistry, sticking to age old concept of conventional complete denture is regressive, which deprives patients of better prosthetic options.

The transition from natural teeth to prosthesis is most comfortable to patient if replaced by full fixed implant prosthesis. However, such a prosthesis is not feasible in all cases due to anatomical, financial or other restrictions. In such cases, giving a 2 implant supported mandibular overdenture gives multifold advantages over the conventional complete dentures and strikes a golden balance with respect to patient compliance and cost factor.

**Aim:** To compare compliance and cost factor in patients using two implant supported mandibular overdentures and conventional mandibular complete dentures

**Study design and Method:** The following criteria were used to select the studies on the patient compliance in patients using mandibular 2 implant supported overdentures and conventional mandibular complete dentures. The inclusion criteria were articles in English or those having detailed summary in English, studies that provide randomized controlled trials and articles on cost comparison between the two modalities. Studies that were published between 1<sup>st</sup> January 1995 to 31<sup>st</sup> December 2015 were included.

**Results:** Various electronic databases were searched using different search strategies from the above mentioned key words and the combinations. The number of articles identified through the database searching were 330 in all. After thorough reading of titles the number of titles found relevant were 200. Further these records were assessed for any duplicates and 100 duplicate articles were removed while including 30 articles. Full text thorough reading of these articles was done and were assessed for eligibility. Only ten articles were qualified and other articles were excluded.

**Conclusions:** The evidence currently available suggests that the restoration of the edentulous mandible, with a conventional denture is no longer the most appropriate first choice Prosthodontic treatment. There is now overwhelming evidence that a mandibular 2 implant supported overdenture should become the first choice of treatment for the edentulous mandible.

**Clinical implication:** In the world of evidence based dentistry we are armed with lot of scientific backing for the above statement. Suggesting and convincing a patient for this modality should be top priority for Prosthodontist. Due to overwhelming evidence on mandibular 2 implant supported overdenture in the literature over conventional mandibular complete denture in respect to patient compliance and cost factors it should be made the first choice of treatment for completely edentulous patients.

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## INTRODUCTION

It is widely accepted that edentulism can lead to malfunction of important functions as well as undesirable alterations in patient's aesthetics and mental state (Harris *et al.*, 2013). It was found that bulk of edentate patients were aged and from a low income group. (Leake, 1988) The implications of edentulism are so severe that even WHO recognized it as a physical disability in 2001 (Allen, 2005; Locker, 1992). Some of the implications are, increasing alveolar bone loss and reduced efficiency of chewing. Exfoliation of teeth results in remodeling

and resorption of contiguous alveolar bone and ultimately ends in atrophic edentulous ridges. (Bradbury *et al.*, 2006) These are some of the consequences caused due to edentulism –reduced bone width, protruberent mylohyoid and internal oblique ridge. Hyperactive tongue during masticatory function along with resultant macroglossia in various degrees. The most visible alterations in terms of esthetic are noticed in the lower one third of the face. The threat of mandibular body fracture is elevated as a consequence of advanced bone loss. The treatment plan for such edentulous patients can comprise of one of the mentioned treatment modalities below. First is the conventional complete denture, Implant supported overdentures or a implant supported fixed prosthesis. (Allen *et al.*, 2001) Conventional denture results in less general satisfaction

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and decreased long term retention and stability, lack of comfort and progressively reducing masticatory forces. (Awad *et al.*, 2003) The functional problems include loose denture, reduced efficiency in daily task like speaking or chewing, and impacted social life due to apprehension or embrassement caused by loose dentures. (Allen *et al.*, 2001) With the technological advancement in implantology the field of dentistry has been revolutionized. Thus benefitting completely edentate patients. Generally mandibular dentures are loose fitting as compared to maxillary denture and it is important that the patients find contentment in the provided treatment for it to be deemed successful. The literature says that there is significant acceptance of mandibular 2 implant supported overdenture opposing a conventional complete denture by majority of patients over a conventional complete mandibular denture. The level of success of treatment can also be gauged by its cost effectiveness as given by the formula difference in cost divided by difference in effect. There have not been many systematic reviews that elucidate the effectiveness of 2 implant supported mandibular overdenture as compared to conventional mandibular denture. (Zitzmann *et al.*, 2006)

### Aim- To compare:

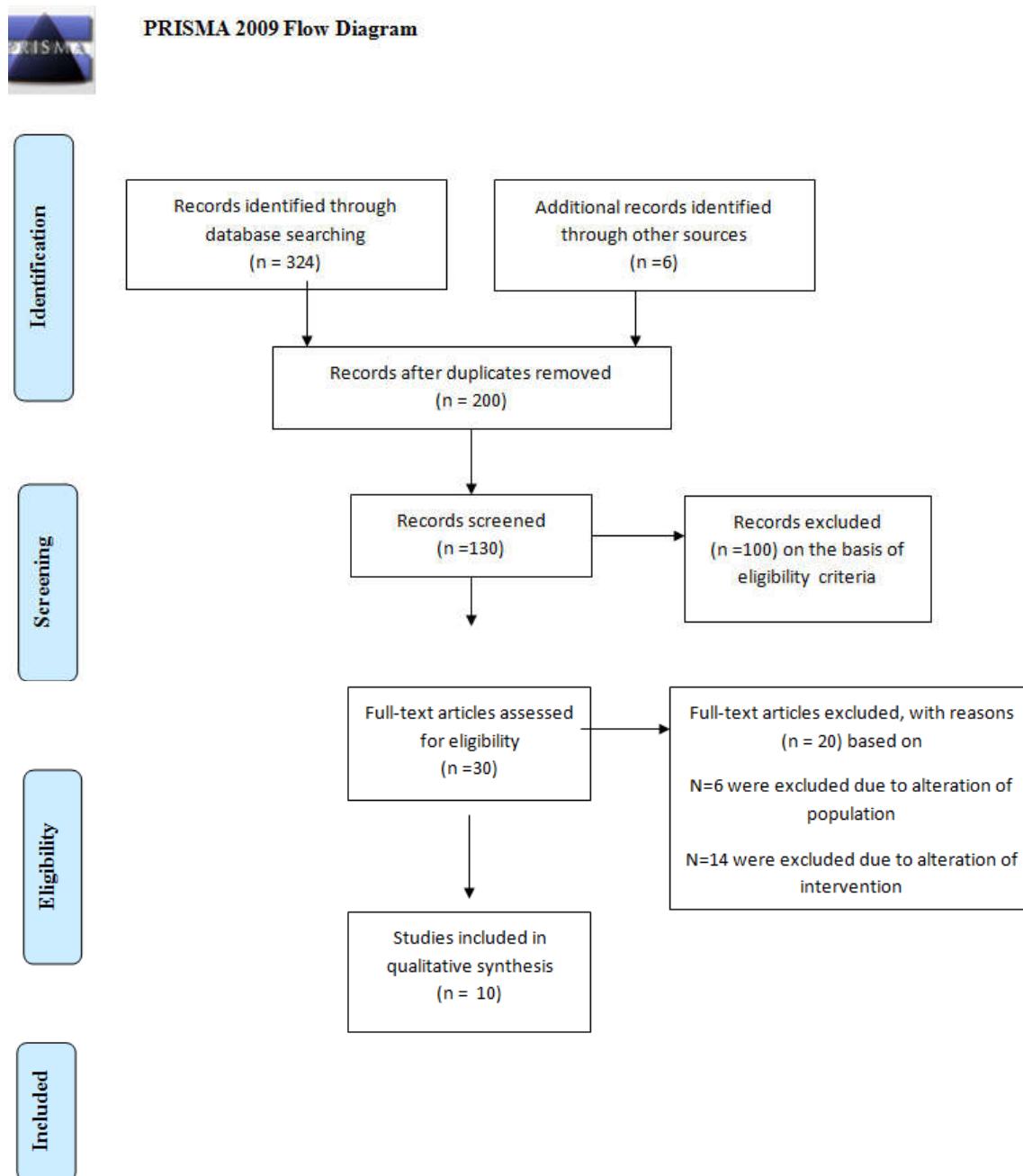
Patient compliance and cost effectiveness between mandibular 2 implant supported overdenture and conventional mandibular complete denture.

### Study Design and method

#### Eligibility criteria

#### Inclusion criteria

- 1) Articles in English or those having detailed summary in English.
- 2) Studies published between 1st January 1995 and 31st December 2015.
- 3) Healthy patients.
- 4) Articles which had done Randomized controlled trials.
- 5) Opposing maxillary conventional denture.



## Exclusion

- 1) Articles in any other language than English
- 2) Patients having any systemic disorders.
- 3) Review, case reports, abstracts, letters to editors, editorials and in vitro studies.
- 4) No opposing maxillary conventional denture

## Data collection

Three electronic databases were used as sources in the search for studies satisfying the inclusion criteria, The National Library of Medicine (MEDLINE via Pubmed), Cochrane Central Register of Controlled Trials and Google Scholar. These databases were searched for studies published from 1<sup>st</sup> January 1995 to 31<sup>st</sup> December 2015. The manual hand search using DPU college library resources was carried out. Cross references for articles selected was done.

## RESULTS

According to the articles which were selected by the authors, mandibular 2 implant supported overdenture has considerable advantages in terms of patient compliance as well as cost factor considering a decade of use.

## DISCUSSION

With the technological advancement in the field of Implantology, the benefit should be passed on to the patients having missing teeth. Complete denture patients have numerous problems in retention of the denture. In the age of evidence based dentistry we as Prosthodontist should be able to convince our patients for this superior option of implant overdenture. Hamdan *et al.* (2013) conducted a study for comparing dietary intake between implant supported overdenture and conventional mandibular complete denture patients. It is assumed by the author that people wearing mandibular 2 implant supported overdenture have less difficulty than those wearing conventional complete denture. No significant changes were found at one day and one year of recall. The fact that this study revealed similar dietary intake in both groups suggests that either the same foods were eaten, but prepared differently, or that different foods with similar nutritional profiles were consumed. Therefore, the chance of gaining nutritional benefit in this population may be limited. Guido Heydecke *et al.* (2008) conducted a study if mandibular implant supported overdentures and conventional complete dentures meet the expectations of edentulous patients, 162 edentulous patients were enrolled in 2 trials and, after randomization, received either a mandibular 2-implant supported overdenture or a new conventional denture. Post treatment Complete Denture satisfaction failed to meet patients' pretreatment expectations of patient; this was not the case for Implant Overdentures, for which expectations were largely met. David Harris *et al.* (2013) conducted a study to compare between implant-supported mandibular overdentures and conventional dentures on quality of life in edentulous patient's. In a randomized, prospective, controlled study, 122 edentulous patients underwent baseline assessment of denture satisfaction and quality of life. Implant overdenture group showed significant additional improvements at 3 months following Implant overdentures on the functional limitation, physical pain, psychological discomfort, physical disability, social disability, psychological disability and handicap scales of the

Oral health impact profile and on 10 of the 11 scales of the Denture Satisfaction Questionnaire : The findings show that, controlling for expectancy bias and variability in baseline levels, Implant overdentures significantly increase patient satisfaction, dental function and quality of life over and above those achieved with good quality Complete dentures.

Finbarr *et al.* (2001) conducted a study that assessed the impact of implant stabilized prostheses on the health status of complete denture patients, Total of 75 patients were included in the study of which 20 received mandibular 2 implant overdentures and the rest received conventional complete denture. They concluded that the patients receiving mandibular 2 implant overdenture reported a significant improvement after treatment, as did subjects who requested conventional replacement dentures. Raghoebher *et al.* (2000) conducted a study to evaluate effectiveness of two treatment modalities on the edentulous mandible. The author's main aim was to evaluate subjective chewing ability of edentulous patients treated with two treatment options. The author noted that implant overdenture are satisfactory treatment modality for edentulous patients with problems of lower denture and should be used in cases of severely resorbed lower ridges and thus be preferred over conventional dentures. Manal Awad *et al.* (2003) conducted a study to compare the relative efficacy of mandibular overdentures retained by only two implants and conventional dentures. All subjects rated their general satisfaction and other features of their original dentures and their new prostheses (comfort, stability, ability to chew, speech, esthetics, and cleaning ability) Oral health-related quality of life was also evaluated pre- and posttreatment. The author concluded that short term results suggest mandibular 2 implant overdenture provide better function and oral health related quality of life than conventional complete dentures.

Guido Heydecke *et al.* (2005) conducted a study to determine the impact of mandibular 2 implant overdentures or conventional complete dentures on leisure and sexual activities. Oral health related quality of life was measured with Oral Health Impact Profile. Two month after denture delivery there were significant improvements in the implant supported overdenture group for looseness when eating, speaking, kissing and yawning. Manal A. Awad *et al.* (2003) conducted a study to compare the relative efficacy of mandibular overdentures supported by only two implants and conventional dentures. Edentulous adults, aged 35 to 65 years, were randomly assigned to two groups that received either a mandibular conventional denture ( $n = 48$ ) or an overdenture supported by two endosseous implants( $n = 54$ ). Oral health-related quality of life was also evaluated pre- and post treatment. The overall findings concluded that Implant overdenture is a more satisfactory treatment option than conventional dentures for edentulous middle aged adults. Zitzmann *et al.* (2006) performed a stochastic cost effectiveness analysis, comparing implant retained overdenture and complete denture from a patient's perspective in Switzerland, to assess whether implant treatment in mandible represents for money spent. 20 patients were included in each group and follow up was kept for ten years. Health outcomes were expressed in quality adjusted prosthesis years, while cost was recorded in year 2000 in Swiss Francs. Quality adjusted prosthesis years are 0.86 for cd and 1.46 for mandibular 2 implant supported overdenture. Considering a decade of prosthesis usage, implant overdenture is a cost effective option considering its benefits. Yoshiaki Takanashi *et al.* (2004) compared the cost of mandibular 2

implant overdenture treatment to that of conventional denture treatment. The direct cost of mandibular 2 implant overdenture treatment was 2.4 times higher than that of conventional denture treatment. When indirect cost were added, the implant to conventional total cost ratio estimate was 1.8. These cost data can be combined with the estimates of the efficacy of the two types of prosthesis so the dentist and patient can make decision regarding the treatment options.

### Clinical application

Due to overwhelming evidence on mandibular 2 implant supported overdenture in the literature over conventional mandibular complete denture in respect to patient compliance and cost factors it should be made the first choice of treatment for completely edentulous patients. In a decade of use of mandibular 2 implant supported overdenture is more beneficial considering that the conventional complete denture will have to be repeated every years as well as the follow up appointments. Considering the cost for follow up appointments as well as the time lost by the patient, mandibular 2 implant supported overdenture may be a cheaper option.

### Conclusion

In the world of evidence based dentistry we are armed with lot of scientific backing for the above statement. Suggesting and convincing a patient for this modality should be top priority for Prosthodontist. Cost is perceived differently by different patients, like a well off patient may think that an initial larger investment is better than repeated visits to a dentist. Likewise a poor patient will think for the time being and would be happy to spend less money multiple times. So this choice will be left to the patient considering his financial capability.

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