

Fixed Partial Dental Prosthesis in Patient with Alveolar Bone Loss: A Systematic Review

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Abstract

To show and describe what kind of fixed partial denture usually used in patient with bone loss. The articles was search form PubMed data base. The electronic databases were searched using of Medical Subject Headings (MeSH) terms, search terms and their combinations: "fixed partial denture" and "alveolar bone loss". There are 35 journals explained about this, with only 5 journals meet the inclusion criteria. The database search yielded 35 references from PubMed. The titles and abstract were reviewed afterward, and 13 studies were eligible for further analysis. The full-texts been reviewed by the reviewer and yielded 5 articles which meet the inclusion criteria, with the total patient 270. There is scientific evidence that implant and combination of fixed bridge with removable were mostly used in patient with alveolar bone loss.

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Introduction

Alveolar bone loss generally caused by trauma, extraction, congenital, periodontitis, surgical complication, or the removal of tumors or cysts. This often results in the extensive loss of alveolar bone, teeth, and gingival tissues leading to esthetic and functional problem.¹ The use of denture purposes not only to improve the function of mastication, phonetic function and aesthetic function, but also need to maintain the health of the rest of the tissues.² Such cases require not only replacement of the missing teeth but also the restoration of the bone defect, aesthetics and phonetics.³ There are many different treatment option are available to replace missing soft and hard tissues, including removable dental prosthesis, fixed dental prosthesis, implant prosthesis, or combination of other treatments.⁴ Some literature suggest to use implant prosthesis because of the best retention,

compatible, successful and predictable treatment modality, offering enhanced esthetics and biomechanical advantages.⁵ Conventional tooth supported fixed partial dentures have long been regarded as the standard of care in replacement of single and multiple missing teeth, if implants are contraindicated or patient refuse the implant therapy. Others suggest to use removable dental prosthesis because of the lower cost, easy to maintain the oral hygiene, and shorter treatment times.⁶ The others suggest to use combination of others treatment, such as fixed prosthesis combine with removable dental prosthesis.⁷ The purpose of the article to show and describe what kind of fixed partial denture usually used in patient with bone loss.

Methods

This systematic review was written according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to identify fixed partial denture treatment in patient with bone loss⁸.

Search Strategy

The articles was search form pubmed data base to establish a study protocol. PICO question (Population (P), Intervention (I), Comparison (C), Outcomes and Study Design

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(O)), defined the search strategy, where P = patient with bone loss, I = fixed partial denture, C = the type of fixed partial dentures, O = efficacy of the treatment. The electronic databases were searched using of Medical Subject Headings (MeSH) terms, search terms and their combinations: "fixed partial denture" and "alveolar bone loss". There are 35 journals explained about this, with only 5 journals meet the inclusion criteria.

Study Selection and Eligibility Criteria

All titles and abstracts of the selected journals were reviewed for the following inclusion criteria:

- English language article
- The absence of bone loss
- That journal included information about fixed partial denture
- That studies reports information about type of fixed partial denture should be used as abutment.
- That journal included information about efficacy of the treatment

The exclusion criteria were all journal which did not satisfy the above-mentioned criteria, such as animal studies, treatments with complication are excluded in this study. After reading the full texts of the articles, the data evaluated to the previously defined exclusion criteria. The eligibility criteria were used to identify articles that will be used for this systematic review.

Extraction of Data

The data were reviewed by two reviewers (SW and ID) that regarding following parameters: type of fixed partial denture, bone loss and objective. All of the full text which meet the inclusion criteria were read independently and evaluated to formulated this systematic review.

Results

The database search yielded 35 references from PubMed. The titles and abstract were reviewed afterward, and 13 studies were eligible for further analysis. The full-texts been reviewed by the reviewer and yielded 5 articles

which meet the inclusion criteria. The flow chart of article selection is shown in figure 1 with total 5 selected from initial yield of 35 studies by electronic literature search. After 35 titles of full text reviewed, 5 articles were selected for this systematic review inclusions, were the other 31 articles were excluded for some different reasons.

Table 1 showed that there are two clinical reports, two case reports, and prospective study. The type of the studies was mostly clinical report, with the latest studies was conducted by Tambe et al.⁹ The patient's age of these studies were range between 33 - 59. Total patients of these studies are 270.

Tambe et al.⁹ and Jose Maurico et al.¹⁰ and using combination fixed bridge and removable denture. Ganeles et al.⁵ and Sierralta et al.¹¹ were using implants, and only one was using fixed bridge.¹² Selection of the treatment in these studies depends on good systemic and psychological conditions, time, financial investment, cooperation, and patience.⁴

Discussion

Tambe et al.⁹ said that most of patients prefer fixed prosthesis but the treatment with fixed prosthesis will have a poor long-term prognosis. In such situation, fixed removable andrew bridges system is one of the treatment modalities. The advantages of this system are adequately reported in the literature which includes better aesthetics, hygiene along with better adaptability and phonetics, comfortable and economical for patients. This type of prosthesis is more retentive and stable with minimal extension. Good soft tissue response due to less soft tissue impingement. This system avoids transfer unwanted leverage forces to the abutment teeth by acting as a stress breaker.⁹

According Jose Mourico et al.¹⁰, rehabilitation using an FPD/RPD with attachments is one of the most conservative and best indicated therapeutic modalities considering the limiting bone condition and the extension of the prosthetic space. Furthermore, this treatment option provides a better esthetic appearance and improved retention and function than does a conventional clasp-retained RPD.

Author (y)	Type of Study	Region	Number of Patients (n)	Age (y)	Type of Fixed partial dental prosthesis
Jose Maurico, et al. (2013)	Clinical report	America (Brazil)	1	55	Combination (fixed bridge+removable)
Abhijit Tambe, et al. (2014)	Case report	Asia (India)	1	38	Combination (fixed bridge+removable)
Avinash S, Brida, et al (2011)	Case report	America (USA)	1	42	Fixed bridge
Jeffrey Ganeles, et al (2008)	Prospective Study	America (USA)	266	33-59	Implant
Marianella Sierraalta, et al (2009)	Clinical report	America (USA)	1	40	Implant

Table 1. Descriptive Data from the 5 Included Criteria Studies that Reported on using Fixed Partial Dental Prosthesis.

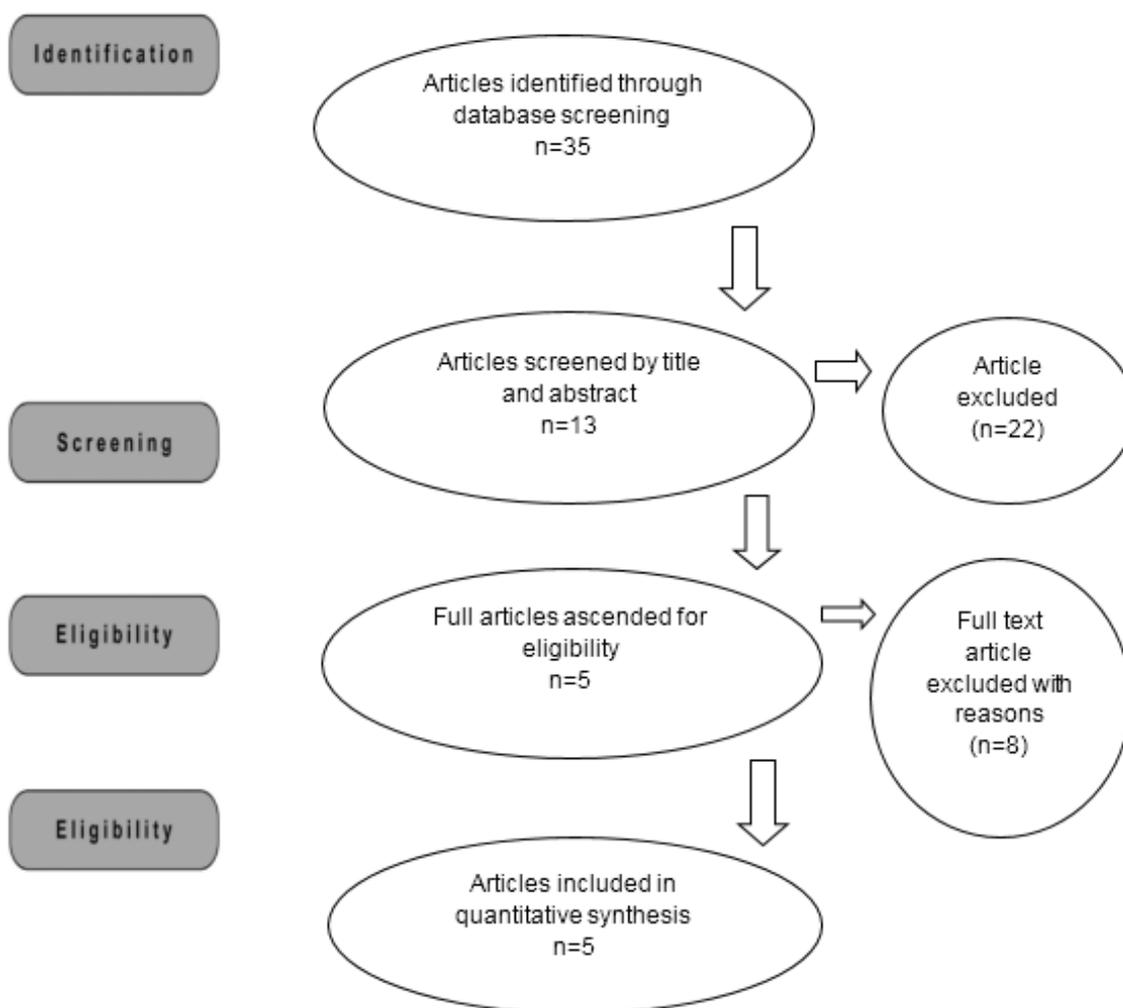


Figure 1. Article Selection Flow Chart.

In addition to financial considerations, contemporary treatment planning is relatively straightforward in the partial edentulous region, if there is adequate bone available for implant

placement. Careful consideration should also be given for soft tissue phenotype (thick versus thin), tooth form (square versus triangular), and height of existing interdental papilla of adjacent teeth.

However, minimal or lack of any bone for implant placement, warrants careful consideration and re-assessment in the approach for treatment planning. Bidra, Chapokas¹² explained their reason of choosing the treatment based on the perspective of the patients, reduction of enamel and dentin on healthy adjacent teeth to support an FPD was deemed less aggressive and less painful than harvesting a large volume of cortical bone graft from the ramus or symphysis.¹²

Conclusion

This studies shown scientific evidence that implant and combination of fixed bridge with removable were mostly used in daily treatment in patient with alveolar bone loss. This systematic review has limitation there were only five studies after reviewing and selecting 35 articles and most of them were a clinical report that only have 1 patient in each studies. Therefore, further studies with large sample size and high methodological quality is required for more accurate results.

Declaration of Interest

All the authors hereby decalre that there is no conflict of interest.

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