Original Article

Prosthodontics

Effect of Relining Methods on Dimensional Accuracy and Stability of Conventional Complete Dentures - A Literature Review

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ABSTRACT

Objective: To review the literature in order to evaluate the effect of relining methods on dimension accuracy and stability of conventional complete denture.

Study Design: Review of literature.

Materials and Methods: The literature search was mainly performed through internet. Abstracts and full text of articles published in journals indexed by index Medicus were searched Pubmed. A Google search was also performed to obtain material available at websites of different dental associations. The comparison was made among original research studies, cross sectional surveys, meta analysis, review articles and guidelines in context to the purpose of study.

Results: The laboratory reline method has relatively good dimensional stability and strength, but presents a major drawback i.e patient has to be without denture for a certain period of time, on the other hand chairside reline method seems to be convenient and easy and require short working time. Autopolymerising acrylic resins have the potential of causing chemical or thermal burns of the oral mucosa. Autopolymerising direct chairside relining materials have been used widely in clinical setting.

Conclusion: The Direct chairside method is advisable as it presents the least gap at posterior palatal seal area. However chairside relines are technique sensitive and require experience.

Key Words: Relining,Complete Denture, Stability, Retention

INTRODUCTION

The likelihood of tooth loss increases with age as a result of the cumulative effects of caries, periodontal diseases, trauma and dental treatment[1]. The total number of patients requiring complete dentures is increasing worldwide[2]. Complete dentures are the most common prescription offered to the edentulous patients worldwide[3]. The loss of natural teeth is associated largely with low socioeconomic status[4].

The recognition, understanding and incorporation of certain mechanical, biologic and physical factors are necessary to ensure optimal complete denture treatment[5]. These factors are the determinants that promote the properties of retention, stability and support in complete dentures[6]. Patient requirement of complete denture are to restore the normal contour, function, comfort and speech. Most of these goals are accomplished through achieving retention[7,8].

Alveolar ridge inevitably undergoes resorption with advancing age, irrespective of individual uses denture or not. Means available to deal with loss of denture fit are fabricating new dentures or relining[9].

Relining is a procedure to resurface the tissue surface of denture with new base material to make the denture fit more accurately[10,11]. Relining can reduce the frequency of patients visit and expenses as compared to fabricating new dentures. There are two methods of reling; direct (Chairside method) or indirect (laboratory method)[12]. In direct method cold cured acrylic or tissue conditioners are used but are not very durable and it's the only short term solution[13]. In indirect method the fitting surface is cleaned. The undercuts are removed and the flanges are shortened. Minor defects and extensions can be corrected with self cure acrlylic[14].

The indirect method has advantage over the direct method in that an appropriate thickness can be ensured more easily and adhesion is stronger due to lack of exposure to saliva[15].

MATERIALS AND METHODS

The literature search was mainly performed through internet. Abstracts and full text (if available) of articles published in journals indexed by Index Medicus were searched PubMed. A Google search was also performed to obtain material available at the websites of different dental associations. Print material and textbooks were also accessed from different libraries of Liaquat University of Medical & Health Sciences, Jamshoro, including postgraduate section of main library and library at Institute of Dentistry. Some material was also obtained on request from the libraries of College of Physicians & Surgeons Pakistan, Karachi and Jinnah Postgraduate Medical Institute, Karachi.

The material was classified and relevant material was extensively reviewed. The comparison was made

among Original research studies, Cross sectional Surveys, Meta Analysis, Review Articles, and guidelines, in context to the purpose of study i.e to clarify that whether there is any significant role of posterior palatal seal in maxillary complete denture.

RESULTS

The laboratory reline method has relatively good dimensional stability and strength, but presents a major drawback i.e patient has to be without denture for a certain period of time, on the other hand chairside reline method seems to be convenient and easy and require short working time. Although the materials employed constantly improve, but problems still exist. Autopoly merising acrylic resins have the potential of causing chemical or thermal burns of the oral mucosa. Other disadvantages include poor color stability, porosity, and a foul odor. In addition they are difficult to position correctly, are technique sensitive, and can be toxic due to residual monomer. Autopolymerising direct chairside relining materials have been used widely in clinical setting. It should be mentioned, however, that these materials present problems such as odor, poor color stability, porosity, poor physical and mechanical properties, and irritation of the oral mucosa. The oral tissue irritation is caused by methyl methacrylate, the major constitute of the liquid.

DISCUSSION

In this study the available literature was reviewed to find out that the effects of relining methods on dimensional accuracy and stability of conventional complete dentures.

Kim Y and associates conducted an in vitro study to evaluate the dimensional accuracy of different denture relining methods. In their study they used a stainless steel cast to construct 50 identical average sized human definitive casts, which were used to evaluate the dimensional accuracy and stability of different relining methods[16]. They found that the casts relined by direct (chairside) method showed the best dimensional accuracy and stability, which were significantly different ($p<0.0001$) from those cases that were relined by indirect (laboratory heat polymerizing) method.

Results of another study showed that dentures reloned by direct(chairside) method were more accurate when compared to the dentures relined by indirect (laboratory heat polymerizing) method [17]. As the temperature increases in mold is low, and there is a narrow cooling range, the shrinkage that occurs is largely an indication of the polymerizing shrinkage[18]. Results of the study conducted by Smith and coworkers showed that relines that employ autoplymerizing resins have significantly less ($p<0.0001$) changes than those with the head polymerizing resins[19].

Assery MK and Al-Shamrani SM also advocated chairside relining of conventional complete dentures in their study[20]. Yoshinobu M and associates recommended direct relining method due to its simplicity and better accuracy[21].

Pow and coworkers conducted a study evaluate the linear dimensional changes after relining the complete dentures[22]. They reported that in direct chairside method the shrinkage of polymerize base was clinically undetectable and insignificant, thus did not cause clinically significant dimensional changes to complete dentures.

CONCLUSION

The direct chairside method is advisable for cases in which:

- The denture cannot be deposited
- Stimulation of the mucosa overlying the residual ridge is unlikely to occur
- A certain thickness can be ensured
- The occlusal vertical dimension is unlikely to be changed

Direct chairside relines presents the least gap at the posterior palatal seal area. However chairside relines are technique sensitive and require experience.

Recommendations: Further large studies are recommended to evaluate the physical and the mechanical properties, as well as of the dimensional stability of the relined dentures after a period of time that may help to draw definite conclusion.

REFERENCES

1. Roessler DM. Complete denture success for patients and dentists. Int Dent J 2003;53:340-5.
2. K. Denture hygiene:a review and update. J Contemp Dent Pract 2000;1:28-41.
3. Mullane D, Whelton H. National survey of adult's dental health 1989-90. Oral Health Services Research Unit;1990.
4. Burt BA. Epidemology of dental disease in elderly. Clin Geriat Med 1992;8:447-59.
5. Jacobsen TE, Krol AJ. A contemporary review of factors involved in complete denture retention, stability, and support. Part 1: Retention. J Pros Dent 1983;49(1):5-15.
6. Gibson D, Benham C, Racic L, editors. Older Australia at a glance. 2nd ed. Canberra, Australia: AIHW;1999.
7. Nawar NH, Eid HI, Sabet ME. A study on the effect of border molding on retentive efficiency of maxillary complete denture. Cairo Dent J 2005; 21(2):135-40.
8. Carl ME. Contemporary implant dentistry. 2nd ed. Mosby;1999.
9. Shiga H, Terada Y, Ikebe K, AkagawaY,et al. Guideline for denture relining. Prosthodont Res Pract 2007;6:209-16.

10. Veeraiyan DN, et al. Text book of prosthodontics. New Delhi: Jaypee Brothers Med Publishers; 2007.
11. McPhee IM. A history of dentures-the ancient origin of dental hardware.
12. Bergman B, Carlsson GE. Clinical long term study of complete denture wearers. J Prosthet Dent 1985;53:56-61.
13. Knechtel ME, Loney RW. Improving the outcome of denture relining. J Can Dent Assoc 2007; 73:587-91.
14. Relining and rebasing for complete dentures.[online] URL:http://www.dentistry.bham. ac.uk/cal/impress/relined.htm..
15. Kazanji MNM, Watkinson AC. Influence of thickness, boxing, and storage on the softness of resilient denture lining materials. J Prosthet Dent 1988;59:677-80.
16. Kim Y, Michalakis KX, Hirayama H. Effect of relining method on dimensional accuracy of posterior palatal seal. An in vitro study. J Prosthodontics 2008;17:211-8.
17. Anthony DH, Peyton FA. Dimensional accuracy of various denture base materials. J Prosthet Dent 1962;12:67-81.
18. Christensen GJ. Relining, rebasing partial and complete dentures. J Am Dent Assoc 1995;126: 503-6.
19. Smith DE, Lord JL, Bolender CL. Complete denture relines with autopolymerizing acrylic resin processed in water under air pressure. J Prosthet Dent 1967;18:103-15.
20. Assery MK, Al-Shamrani SM. Chairside denture relining with VLC resin-new materials report. Saudi Dent 1991;3:117-9.
21. Yoshinobu M, Motofumi S, Tsuyoshi T, Hideki Y. A direct relining method using a tissue conditioner as the spacer. Prosthodont Res Pract 2005;4:94-7.
22. Pow EH, et al. Linear dimensional change of heat cured acrylic resin complete dentures after reline and rebase. J Prosthet Dent 1998;80:238-45.

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