

Partial Veneer Retainer, a Conservative Approach in Fixed Partial Denture; a Case Report

Dr. Sonal Tholia¹

¹(M.D.S., Department of Prosthodontics, Regional Dental College, Guwahati)

Abstract: *In current practices indiscriminate use of full coverage retainer is violating the principle of conservation of tooth structure and wasting irreplaceable enamel. Under similar circumstances incidence of failures with partial coverage has been found lesser than full coverage crown when used judiciously and prepared correctly. The partial veneer retainer fulfils all the requirement of a restoration; maximal retention with minimum sacrifice of tooth structure, no encroachment on pulp and aesthetically acceptable. This article discusses indications, contraindications, advantages and disadvantages of partial veneer retainer with a clinical case report*

Keywords: *partial veneer retainer, full coverage crown, maximum retention, length of span, occlusal guide.*

I. Introduction

In current practices indiscriminate use of full coverage retainer is violating the principle of conservation of tooth structure and sturdy and skillful procedure of partial veneer retainer has fallen by the wayside. Because of its fast procedure, less margins to be placed precisely, convenience in reconstruction procedure makes full coverage restoration a far easier and popular procedure. In addition to the failures encountered in precise preparation which is crucial step for partial coverage also leads to widespread acceptance and use of full coverage crown as a retainer, particularly in fixed partial denture prosthodontics. Arthur Edward Kahn stated that when indications are precisely followed, judiciously and correctly prepared, failure rates for partial veneer crown has been lower than full coverage crown under similar circumstances.¹ In this article partial veneer retainer is discussed with a clinical case report.

Partial veneer crown is restoration that covers only a part of the clinical crown, most commonly used type of partial veneer crown is three quarter crown. Generally all surfaces except buccal or labial are included in preparation. Sometimes in mandibular molar when lingual wall is excluded and buccal is involved it is called as reverse three quarter crown. The partial veneer retainer fulfils all the requirements of a restoration; Maximal retention with minimum sacrifice of tooth structure, no encroachment on pulp and aesthetically acceptable. It may be used in both anterior and posterior teeth where parallel proximal grooves of an adequate length and retentive walls and planes can be prepared to resist displacing forces and stability can be achieved. Several important factors like degree of occlusal force, length of span, and amount of tooth structure available for preparation should be considered before the preparation of any tooth which determines type of retainer and general bulk of the completed retainer. It is a dentist's responsibility to evaluate carefully and select the most ideal restoration for each specific situation. According to Gillet various preparations for the three-quarter crown were devised by Carmichael, Ward, Tinker, and others.² Carmichael's grooved preparation caused pulpal damage,

Ward's and Tinker's advocated cervical shoulder preparation unbrokenly around the entire tooth except on the labial or buccal surface which causes a profound sacrifice of tooth structure¹. In modern practice modification is made.

Indications of partial veneer crown- Where a sufficient amount of natural tooth structure is available so that grooves and planes can be prepared to resist displacing forces like sound vital tooth, on nonvital tooth, teeth have had lost structures adequately restored. Teeth which has large cingulum and adequate bulk of dentin, square teeth. Long span bridge, low caries index.

Contraindications- Ovoid, conical and tapering and small teeth like mandibular first premolar. Tooth with extreme lingual abrasion or caries, or where lingual half of proximal surface destroyed by caries. High caries index Maxillary canines with long incisal arm. Tooth with poor long axis relationship with path of insertion. Too small or thin tooth. Long span bridge

II. Case Report

A 21 yr old female patient referred to the department of prosthodontics Regional dental college Assam with chief complain of unpleasant aesthetics and difficulty in chewing food. The intraoral examination showed missing maxillary left first premolar. Fig 1-2 Intraoral periapical radiograph showed good bone support around the adjacent teeth .Options for treatment explained to patients were-

- 1 Implant
- 2 Fixed partial denture with retainers of full coverage
- 3.Fixed partial denture with partial veneer retainer.

Because of surgical intervention of implant patient showed reluctance. Considering the patient age ,and other factors like low caries index and good alignment of teeth, it was decided to fabricate fixed partial denture with partial veneer crown as retainer.

Technique –

Step by step procedure-

1. A diagnostic impression was made . A diagnostic cast was surveyed to determine the best path of insertion.
- 2.Tooth preparation for partial veneer crown on canine and second premolar was done. Fig 3.
3. Putty-wash impression (3 M ESPE) was made ,for the preparation of the working model.Fig 4. It was poured in high-strength die stone (Kalabhai Karson Pvt.Ltd.).
4. Provisional restoration was cemented.
- 5 After casting, metal try-in of the individual units were done to verify proper seating. Fig. 5-6.
- 6 Then ceramic layer was added. Final cementation done. Fig .7-8.

III. Figures



Figure 1-2 Preparation intraoral view



Figure 3-Tooth preparation done



Figure 4- Impression made



Figure 5-6 Metal tryin occlusal and lateral view



Figure 7-8 Post cementation occlusal and lateral view

IV. Discussion

Advantages of partial veneer crown over full coverage are less gingival irritation with partial veneer than full coverage it is because of less margin in partial veneer is in contact with gingiva. Supragingival margin of partial veneer crowns protects the gingival health.^{1,3-5} To establish a occlusal relationship with opposing tooth is more difficult with full coverage crown because all helpful guides are lost. With partial proper form and contour in all dimension can be established accurately, but in full coverage where all guides are lost this entirely depends upon dentists guesswork and lab work. This proper contouring and establishment of embrasure has greatest impact on periodontal aspect of restoration. Improperly shaped and contoured crown causes inevitable damage to periodontium.¹

Pulp protection- Full coverage crown preparation should be limited to circumstances where pulp hazard can not be avoided. A study showed that pulpal death associated with full coverage crown is 2.4 times of partial veneer crown.⁶

Bender, Seltzer, and Kaufman' stated that during the full crown preparation deep preparation is done in order to achieve parallelism, so large amount of dentinal tubules are open, considerable force exerted during impression making, hydraulic pressure during cementation , exposure to saliva and bacteria in tissues all exaggerate the damage to pulp. Particularly noncarious tooth which are used as abutments where secondary dentin formation as a physiological response is less in comparison to carious tooth are more prone to damage to pulp during rapid and sudden cutting procedure. This sudden process can result in hyperemia with subsequent degenerative change⁷.

Another advantage of partial veneer retainer is proper seating during cementation. Because of escapeways for cement, hydraulic pressure is not created.

In partial venner crown vertical dimension is maintained because of remaining occlusal guide.

Few disadvantages are also there like limited adjustment can be done during preparation in the path of withdrawal, possibility of showing metal ,possibility of recurrent caries along the margins and time consuming procedure,

Tinker⁸, discussed the reasons for the failure of crowns and fixed partial prostheses,and stated that: 'Chief among the causes for such disappointing results have been: First, faulty, and in some cases, no attempt at diagnosis and prognosis; second, failure to remove foci of infection and inattention to treatment and care of the investing tissues and mouth sanitation; third, disregard for tooth form; fourth, absence of proper embrasures; fifth, interproximal spaces; sixth, faulty occlusion and articulation.'" Bartlett⁹ stated that design and judgement is the most important for a success of any restoration.

According to Kopp¹⁰ the strength of the partial veneer retainer depends upon the double staple action created by the incisal step, proximal grooves, and that portion of an arc formed around the cingulum or lingual surface.

Dentist should think of each perspective and evaluate the condition of the patients mouth before each partial veneer preparation is begun.

V. Conclusion

The retention obtained with the partial veneer is comparable to that of a full cast crown provided that there is sufficient natural tooth structure remaining to place parallel proximal grooves of an adequate length and retentive walls and planes to resist displacing forces and providing the preparation is properly made. Simultaneously the biological concept in dentistry of preservation of tooth tissue at a premium level is also not violated. Full veneer crown use as a retainer for every tooth under all conditions is wrong and can be damaging.

References

- [1] Kahn AE., Partial versus full coverage J.Prosth. Dent. 1960;10:167-178.
- [2] Gillett, H. W., and Irving, A. J.: Gold Inlays by the Indirect System, Brooklyn, 1932Dental Items of Interest Publishing Co.
- [3] Maxwell EL ,Wasser VE ,Debate: full vs partial coverage as the abutment of choice in fixed bridgework.JDC Dent Soc 1961; 36:9-11.
- [4] Miller LL : Partial coverage in crown and bridge prosthesis with the use of elastic impression materials. J Prosthet Dent 1963;13:905-910.
- [5] Silness J : periodontal conditions in patients treated with dental bridges II .The influence of full and partial crowns on plaque accumulation, development of gingivitis and pocket formation. J Periodont Res 1970;5:219-224
- [6] Felton D , Madison S, Kanoy E, Kantor M, Maryunic G : Long term effects of crown preparation on pulp vitality. J Dent Res198;68:1008, abstr no. 1139
- [7] Bender, I. B., Seltzer, Samuel, and Kaufman, Irving J.: Infectibility of the Dental Pulp by Way of Dental Tubules, J.A.D.A. 59:467-471, 1959.
- [8] Tinker, E. T.: Fixed Bridge-work, J. Nat. D. A. 7: 579-595, 1920.
- [9] Bartlett, A. A.: Some Principles of Modern Fixed Bridge Construction, J. A. D. A. 29: 2166-2173, 1942
- [10] Kopp EN. Partial veneer retainers, J Prosthet Dent 23:412-419