



Review Article

Perio-Resto Co-relation – A Review Article.

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Abstract

The correlation between dental restoration and periodontal health should always be considered. If periodontal treatment is properly done before restorations it provides an aesthetically acceptable and functionally stable dentition. This review article aims to provide the knowledge of correlation between the health of periodontal tissues and dental restorative procedures.

Keywords: Correlation, dental restoration, periodontal health.

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INTRODUCTION

A beautiful smile can be accomplished only by a healthy gingiva. An intact periodontium provides a firm foundation for any kind of esthetic or functional prosthesis. Restorative dentistry has a reciprocal inducing relationship with the maintenance of periodontal health. Poor restorative treatment may have adverse effects on the periodontium by increasing accumulation of plaque while untreated periodontal disease

will compromise the success of restorative dentistry.¹ To achieve the long term therapeutic targets of, optimum function, treatment predictability, longevity and maintenance; acute periodontal infection must be treated and controlled. This has to be done before the initiation of restorative or aesthetic dentistry. An adequate understanding of the relationship between periodontal tissues form and function with restorative dentistry is paramount to ensure

adequate rehabilitation of the dentition. Even though most clinicians are aware of this important relationship uncertainty remains regarding specific concepts such as biologic width, its maintenance and applications of crown lengthening in cases of Biologic width violation.² Therefore restorations should be designed to be self-cleansing and they should promote gingival health. The aim of this review is to find the co-relation between restorative procedures and materials on the periodontium.

Rationale for therapy

Reasons for maintaining periodontal health before performing restoration are:

1. Periodontal treatment should be undertaken to ensure the establishment of stable gingival margins before tooth preparation for restoration.^{3,4} In addition, tissues that do not bleed during restorative manipulation allow for a more accessibility and aesthetic result.^{5,6}
2. Certain periodontal procedure are designed to enhance adequate tooth length for retention, impression making, tooth preparation and finishing of restorative margin.^{5,7} Failure to complete these procedure before restoration can add to the complexity of treatment along with unnecessary risk of failure.⁵
3. Periodontal therapy should follow restorative procedure because the resolution of inflammation may result in the repositioning of teeth or in soft tissue and mucosal changes.⁸
4. Orthodontic tooth movement and restorations completed without considering the importance of periodontal treatment designed for this purpose may be subject to

complicate construction and future maintenance.⁹

Restorative considerations that affect the periodontium

- Restoration contour and contact areas
- Margin adaptation and defects
- Location of margin
- Role of provisional restorations
- Design of fixed and removable partial dentures
- Occlusal function
- Prosthetic and restorative materials and alloy hypersensitivity
- Iatrogenic damage from restorative procedures.

Restorations Contour and contact areas

Clinical longevity of any prosthesis is directly related to achieving proper restorative contours.¹⁰ When the gingiva contacts a non-contoured flat tooth surface, there is a tendency to develop a thick free gingival margin around the tooth. Over-contouring of restorations or faulty placement of contour is a much greater hazard to periodontal health than is lack of contour, since both supra- and sub-gingival plaque accumulation will be enhanced and retained by over-contoured margins. The greater the convexity, the more difficult it is to remove the plaque.¹¹ The facial or lingual surface of a restoration should not have more than 0.5 mm bulge adjacent to the gingival margin because this may interfere with adequate plaque removal.¹² Contact areas should be in the coronal third of the crown and buccal in relation to the central fossa. Proximal contact points are buccal to

the central fossa line, except for maxillary molars founds at the middle third. This creates a large lingual embrasure for optimum health of the lingual papilla.^{10,13}

Marginal adaptation

Researches indicate that even clinically successful crowns have margins that are open. The average opening is about 100 nm, which tends to harbour bacterial plaque even around the best fitting margins of a restoration causing inflammation.^{14,15} Roughness of the tooth-restoration interface from scratches in the surface of carefully polished acrylic and ceramic crowns, inadequate marginal fit of the restoration, dissolution and disintegration of the luting material causing crater formation between the preparation and the restoration and inflammation of gingival.¹⁶

Location of margin: The clinical significance of margin placement

Eissman et al.'s design criteria for fixed partial dentures state that crown margins should be placed on tooth surfaces that are fully exposed to cleansing action, preferably supragingival or slightly into the sulcus.¹⁷ Vigorous tooth brushing was effective up to 0.7 mm below the gingival margin, suggesting that the submarginal extension of restorations should be limited to no more than this distance.¹⁸ Restorative requirements frequently necessitate subgingival margin placement in order to gain resistance or retention form to alter tooth contour, for caries for subgingival tooth fracture removal, in furcation involvement and to hide the tooth-restorative interface or have contacts that need to be lengthened apically to avoid black triangles.¹⁹ In such cases, subgingival margin placement is necessary, marginal fit should be optimal because rough

restorations or grossly open margins lead to an accumulation of bacterial plaque.²⁰

Current trends favor equigingival margins over older concepts of subgingival margins for crowns, which are kinder to the periodontium. Furthermore, advances with emerging translucent restorative materials adhesive dentistry, and resin cements, promote polished

margins that esthetically blend with the tooth for a healthy tooth-restorative interface even when placed equigingival.²¹

Orkin et al demonstrated that sub-gingival restorations had a greater chance of bleeding and exhibiting gingival recession in comparison to supra-gingivally placed restoration margin.²²

Renggli et al showed that gingivitis and plaque accumulation were more pronounced in interdental areas even with well-adapted sub-gingival amalgam restorations compared to a sound tooth structure.²³

Role of provisional restorations

Provisional restorations protect the prepared teeth, reduce the sensitivity of the vital abutments, and prevent tooth migration. They are used to correct esthetics, phonetics and occlusal scheme. They should have good marginal fit and polish. This prevents plaque accumulation and related inflammatory gingival overgrowth or recession.^{1,24,25}

Design of fixed and partial dentures

Stein concluded that the pontic design was more important than the material used in the pontic construction. The undersurface of pontics in fixed bridges should barely touch the mucosa. When the contact is excessive, it prevents cleaning. The “modified ridge-lap” pontic has pinpoint, pressure-free

contact on the facial slope of the ridge, and all surfaces should be convex, smooth, and highly polished or glazed.^{26,27,28}

Occlusion

Cantilever designs often result in fractures of casting and roots and periodontal inflammation around abutment tooth. Occlusal evaluation is to be done after inflammation due to periodontitis has subsided due to changes in tooth-tissue relationship. Occlusal appliance therapy may be used before occlusal adjustment for acute issues. Use cantilevers sparingly and with light occlusal contact if needed with multiple abutments.²⁸

Restorative materials and alloy sensitivity

Self-curing acrylics are less tissue friendly. Improperly finished composites may become rough. Phosphate cements and silicates are irritant. Lab cast and high polish of restorations is important in preventing plaque accumulation.²⁹ Unfavorable gingival reactions to alloys used in the oral environment have been noted.³⁰

Iatrogenic damage from procedures

Not using electrosurgery, cryosurgery and laser in proper way can cause excessive necrosis of the gingiva and in extreme cases, the underlying bone. Excessive pressure during trimming and fitting bands may traumatize the gingival attachment and lead to irreversible gingival recession.³¹

Conclusion

The branches of dentistry are related to a each other by a common motto of preservation and maintenance of the natural dentition in health. Therefore, an interdisciplinary approach is required to maintain the good oral health.

References

1. Yap UJ, Ong G. *Periodontal considerations in restorative dentistry* Operative considerations. *Dent Update* 1994;21:413 -8.
2. Nugala B, Kumar BS, Sahitya S, Krishna PM. *Biologic width and its importance in periodontal and restorative dentistry.* *Journal of conservative dentistry: JCD.* 2012 Jan;15(1):12.
3. Lindhe J, Nyman S. *Alterations of the position of the marginal soft tissue following periodontal surgery.* *Journal of clinical periodontology.* 1980 Dec;7(6):525-30.
4. Lindhe J, Westfelt E, Nyman S, Socransky SS, Heijl L, Bratthall G. *Healing following surgical non-surgical treatment of periodontal disease: A clinical study.* *Journal of clinical periodontology.* 1982 Apr;9(2):115-28.
5. Kois JC. *The restorative-periodontal interface: biological parameters.* *Periodontology* 2000. 1996 Jun;11(1):29-38.
6. Kois JC, Vakay RT. *Relationship of the periodontium to impression procedures.* *Compendium of continuing education in dentistry (Jamesburg, NJ: 1995).* 2000 Aug;21(8):684-.
7. Smukler H, Chaibi M. *Periodontal and dental considerations in clinical crown extension: A rational basis for treatment.* *International Journal of Periodontics & Restorative Dentistry.* 1997 Oct 1;17(5).
8. Sato S, Ujiie H, Ito K. *Spontaneous correction of pathologic tooth migration and reduced infrabony pockets following nonsurgical periodontal therapy: a case report.* *International Journal of Periodontics & Restorative Dentistry.* 2004 Oct 1;24(5).
9. Wennström JL. *Mucogingival therapy.* *Annals of periodontology.* 1996 Nov;1(1):671-701.

10. Becker CM, Kaldahl WB. Current theories of crown contour, margin placement, and pontic design. *J Prosthet Dent* 1981;45:268-77.
11. Lindauer SJ, Gay T, Rendell J: Effect of jaw opening on masticatory muscles: EMG-force characteristics. *J Dent Res* 1993; 72(1):51.
12. Amsterdam M, Fox L: Provisional splinting: Principles and techniques. *Dent Clin North Am* 1959; 4:73.
13. Burch JG. Ten rules for developing crown contours in restorations. *Dent Clin North Am* 1971;15:611-8.
14. Kois JC. The restorative-periodontal interface: Biological parameters. *Periodontol 2000* 1996;11:29-38.
15. Burch JG. Ten rules for developing crown contours in restorations. *Dent Clin North Am* 1971;15:611-8.
16. Vacaru R, Podariu AC, Jumanca D, Galuscan A, Muntean R. Periodontal-Restorative Interrelationships. *Oral Health Dent Med Bas Sci* 2003;3:12-5.
17. Eissmann HF, Radke RA, Noble WH. Physiologic design criteria for fixed dental restorations. *Dent Clin North Am* 1971;15:543-68.
18. Fugazzato P, Hains F, De Pauli S. Periodontal-Restorative Interrelationships: Ensuring Clinical Success. 1st ed. West Sussex U.K: John Wiley and Sons. Inc.; 2011.
19. Schluger S, Yuodelis RA, Page RC. Periodontal Disease. Philadelphia: Lea and Febiger; 1977. p. 586-617.
20. Vacaru R, Podariu AC, Jumanca D, Galuscan A, Muntean R. Periodontal-Restorative Interrelationships. *Oral Health Dent Med Bas Sci* 2003;3:12-5.
21. Goldberg PV, Higginbottom FL, Wilson TG. Periodontal considerations in restorative and implant therapy. *Periodontol 2000* 2001;25:100-9.
22. Orkin DA, Reddy J, Bradshaw D. :The relationship of the position of crown margins to gingival health. *J Prosthet Dent* 1987;57(4):421-4.

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