REVIEW ARTICLE-

Periodontal Considerations In Restorative Dentistry

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Abstract

A beautiful smile can be crafted only against a backdrop of healthy gingiva.The real art of dentistry is to co-ordinate and interface these perspectives and provide the best quality of care to the patient. The relationship between periodontal health and restorative dentistry is key to achieving optimal aesthetic and functional outcomes.This review article summarizes the importance of periodontal considerations in restorative dentistry.All restorative therapies generally require a healthy periodontium as a prerequisite for successful outcome hence forth periodontal tissues form the foundation for proper esthetics, function, and comfort of the dentition.Maximization of long - term restorative treatment outcomes is highly dependent upon the periodontal milieu into which restorative therapy is placed. Correct crown contour in the gingival third; correct polishing and rounding of the margin; sufficient zone of the attached gingiva; and, no biologic width violation by the margin. Repeated maintenance visits, patient co-operation and motivation are important for improved success of restorative procedures with pristine periodontal health.

KEYWORDS: Operative dentistry, periodontium, aesthetics, gingiva, contact and contours

INTRODUCTION

A beautiful smile can be crafted only against a backdrop of healthy gingiva.[1] The real art of dentistry is to co-ordinate and interface these perspectives and provide the best quality of care to the patient. [1]The relationship between periodontal health and restorative dentistry is key to achieving optimal aesthetic and functional outcomes. A healthy periodontium supports restorative success and influences design, such as margin placement and crown contours.[2] Poor restorations can worsen plaque buildup and harm periodontal health, while untreated periodontal disease can compromise restorative outcomes. This review article summarizes the importance of periodontal considerations in restorative dentistry.[3]

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IMPORTANCE OF HEALTHY PERIODONTIUM

The reasons why healthy periodontium is needed or periodontal disease should to be eliminated prior to restorative dentistry are:

- To locate and determine the gingival margins of restorations properly; Margins of restorations covered by inflamed gingiva shrinks after periodontal treatment.
- The position of the tooth may be altered in periodontal disease. Resolution of inflammation after treatment causes the tooth to move again, often back to its original position.
- Restorations designed for teeth before the periodontium is treated may produce injurious tensions and pressures on the treated periodontium.
- Inflammation of the periodontium impairs the capacity of abutment teeth to meet the functional demands made on them.
- Discomfort from tooth mobility may interfere with mastication and function.
- It is easier to obtain accurate impressions and make more precise preparations on healthy gingivae than inflamed ones.
- To minimize the risk of trauma to the gingival tissues during preparation and impression procedures.[5]

EFFECT OF RESTORATIVE TREATMENT ON THE PERIODONTIUM

- **CONTOUR AND CONTACT AREAS**

Contour: Problems with over contouring:

- "Food traps" from open contacts, overhangs, or plunger cusps may occur
- Poor occlusal design, and poor aesthetics
- When the coronal contour of a restoration prevents access for oral hygiene or creates mechanical pressure on the gingival tissue, gingival health is likely to be compromised
- Plaque accumulation, inflammation, bleeding, and potential bone loss. Plaque is the primary factor in gingivitis.

Thus, if proper contour is not given to the tooth, it may lead to periodontal problems.

Contact areas:

Open proximal contacts are considered to be contributing factors to periodontal pocket formation. Whereas deficient interproximal integrity may be unclear, open contacts leading to food impaction are often uncomfortable to the patient, and prevent the self-cleaning mechanisms of the adjacent cheek, lips and tongue, and it is still generally accepted that tight interproximal contacts are important for gingival health.[6]

MATERIALS

There are several biological responses that can occur when a material is placed in contact with living tissue, this response may be inflammatory in nature, allergic, toxic and mutagenic.[7]

PROVISIONAL RESTORATIONS AND RESTORATIVE MARGINS

When a poorly contoured provisional restoration is placed, the inflammatory process starts and can be perpetuated after the final restoration is cemented as the area remains injured. It is important to correct margins and roughness of any provisional as soon as detected to prevent and/or reverse damage leading to loss of periodontal attachment.[8]

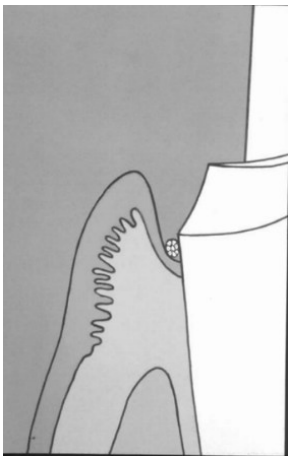
GINGIVAL RETRACTION AND IMPRESSIONS

Application of gingival retraction procedures is usually done for the following:

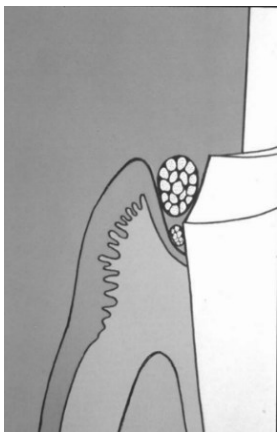
1. Isolation of cavity prepared close to the gingival margin
2. Control of haemorrhage during restorative material placement
3. Diagnosis of sub gingival caries
4. Recording sub gingival margins during impression for indirect restorations
5. Protection of the gingiva during preparation of tooth for direct or indirect restoration with sub gingival margins, including implant-supported restorations
6. Better visualization of the preparation margins
7. During crown lengthening procedures
8. Helps visualize margins and remove excess cement during final seating and cementation of indirect restorations
9. Removing excessive gingival tissue

Methods of gingival displacement:

Mechanical - Matrix band and wedges, Rubberdam, Retraction cords.[9,10]



Single cord technique



Double cord technique

- Cordless methods: Magic foam cord, Expasyl, Gingi Trac, Retraction capsule and Chemicomechanical retraction.
- Surgical methods: Rotary Curettage**,**Electrosurgery and Laser.[11]

OVERHANGING RESTORTIONS

Deficient dental restorations or prostheses are the contributing factors to gingival inflammation and periodontal destruction.[12]

PERIODONTAL PROCEDURES RELEVANT TO RESTORATIVE DENTISTRY

CROWN LENGTHENING

The indications for crown lengthening are:

- Inadequate clinical crown for retention due to extensive caries, sub gingival caries or tooth fracture, root perforation.
- Short clinical crowns.
- Placement of sub gingival restorative margins.
- Unequal, excessive or unaesthetic gingival levels for aesthetics.[13]
- Planning veneers or crowns on teeth with the gingival margin coronal to the cemento enamel junction (delayed passive eruption).
- Teeth with excessive occlusal wear or incisal wear.
- Teeth with inadequate interocclusal space for proper restorative procedures due to supra eruption.
- Restorations which violate the biologic width.
- In conjunction with tooth requiring hemi section or root resection.
- Assist with impression accuracy by placing crown margins more supragingivally.[14]

Contra-indications & Limiting Factors

- Inadequate crown to root ratio
- Non restorability of caries or root fracture
- Aesthetic compromise
- High furcation
- Inadequate predictability
- Tooth arch relationship inadequacy
- Compromise adjacent periodontium or aesthetics
- Insufficient restorative space
- No maintainability[15,16]

IATROGENIC DAMAGE TO PERIODONTIUM BY RESTORATIVE TREATMENT PROCEDURES

CAVITY PREPARATION

Care should be taken not to damage the gingival tissues during cavity preparation. Slight abrasions heal rapidly, but it can be avoided, if possible, as such abrasions cause recession, thus depleting the entire zone of attached gingiva and recession.[17]

APPLICATION OF THE RUBBER DAM

The clamp of rubber dam if not properly seated and being forced sub gingivally leads to tissue damage or recession.

PLACING THE MATRIX

After cavity preparation, a properly designed and contoured matrix should be placed so that it does not injure the biologic width and yet can be adapted accurately to the margins.[18]

MARGINAL FIT

Margins that are significantly open are capable of harbouring large numbers of bacteria and may be responsible for the inflammatory response seen.

SUBGINGIVAL DEBRIS

An adverse periodontal response can be created if debris is left below the tissues during restorative procedures. The source can be retraction cord, impression material, provisional material, or either temporary or permanent cement.

IMPRESSION TECHNIQUES

Severe and painful periodontal reactions will occur if rubber-based impression material is left into the gingival tissues during impression-taking procedures leading to gingival inflammation and may be misdiagnosed at a subsequent appointment.[19]

TEMPORARY RESTORATIONS

Temporary restorations will aid in healing after tooth preparation.

Careless use of disks, burs and stones may destroy connective tissue fibres. If this is followed by inadequate temporary coverage with unadapted, unpolished and imperfect margins, marginal inflammation and apical migration of the junctional epithelium ensues.[20,21]

CURRENT TRENDS IN PERIODONTAL ASPECTS OF RSTORATIVE DENTISTRY

- Supragingival placement of margins of restorations
- Avoidance of over contoured restoration, and minimal concern with lack of contour
- Occlusal stability through precise occlusal adjustment and accurate reconstruction of occlusal anatomy in single restorations
- Restricted indications for splinting of mobile teeth
- Hemisection with fixed bridges in cases of extensive bifurcation involvement.[22]

The purpose of restorative dentistry is to restore and maintain health and functional comfort of the natural dentition combined with satisfactory esthetics. Thus, all dental restorations should comply with established requirements for periodontal physiology and health, both with regard to surface and functional characteristics.[2]

CONCLUSION

Periodontal health and restorative dentistry are inextricably linked.

A healthy coexistence between dental restorations and their surrounding structures should be the goal of the conscientious dentist and the expectation of the informed patient.

The health of the periodontal tissues is dependent on properly designed restorations. Incorrectly placed restoration margin and unadapted restoration violates the biologic width. If the margin must be placed sub gingivally, the

factors to be taken into account are: Correct crown contour in the gingival third; correct polishing and rounding of the margin; sufficient zone of the attached gingiva; and, no biologic width violation by the margin. Repeated maintenance visits, patient co-operation and motivation are important for improved success of restorative procedures with pristine periodontal health.[24,25]

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