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Case Report

IATROGENIC DENTISTRY AND PERIODONTAL DISEASE: A REVIEW WITH TWO CASES

Ambulgekar Jayant R¹, Doshi Manan M^{2*}, Ghunawat Dhananjay B³, Shinde Jitendra U⁴, Govalkar Priya R⁵

¹MDS, Ambulgekar Dental Clinic, Dashmesh Nagar, Osmanpura, Aurangabad- 431001 Maharashtra, India

²Post-Graduate Student, Dept. of Periodontics, Yerala Medical Trust's Dental College & Hospital, Navi Mumbai-410210 Maharashtra, India

³Post-Graduate Student, Dept. of Endodontics, M. A. Rangoonwala Dental College & Hospital, Pune- 411001 Maharashtra, India

⁴MDS, Shinde's Dental Care, Near Gajanan Mandir, Aurangabad-431001 Maharashtra, India

⁵BDS, Yerala Medical Trust's Dental College & Hospital, Navi Mumbai-410210 Maharashtra, India

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*Corresponding Author: **Manan Doshi**

Post-graduate student, Dept of Periodontics Yerala Medical Trust's Dental College & Hospital, Navi Mumbai-410210 Maharashtra, India

Email: manandoshi08@gmail.com, Phone no: +91 9920140044

ABSTRACT

The relationship between periodontal health & the restoration of teeth is intimate & inseparable. For restorations to survive long term, the periodontium must remain healthy so that the teeth are maintained. For the periodontium to remain healthy, restorations must be critically managed in several areas so that they are in harmony with their surrounding periodontal tissues. To maintain or enhance the patient's esthetic appearance, the tooth/tissue interface must present a healthy natural appearance, with gingival tissue framing the restored teeth in a harmonious manner.

The primary cause of gingival inflammation is bacterial plaque, along with other predisposing factors. The primary objective of periodontal therapy is the correction of anatomic morphologic defects that may favor plaque accumulation and/ or impair esthetics.

This article represents review on iatrogenic factors with 2 such reported cases during routine clinical practice.

Keywords: Esthetic Appearance, Gingival Inflammation, Bacterial Plaque, Periodontal Therapy, Iatrogenic factors, Orthodontic therapy.

INTRODUCTION

The primary cause of gingival inflammation is bacterial plaque, along with other predisposing factors. These predisposing factors include calculus, malocclusion, faulty restorations, complications associated with orthodontic therapy, self-inflicted injuries, use of tobacco & radiation therapy. Deficiencies in the quality of dental restorations or prostheses are contributing factors to gingival inflammation & periodontal destruction. Inadequate dental procedures that contribute to the deterioration of the periodontal tissues are referred to as iatrogenic factors.

Characteristics of dental restorations & removable partial dentures that are important to maintain periodontal health include: the location of gingival margin for the restoration, the contour of restorations, the occlusion, materials used in the restoration & the design of the removable partial denture.

CASE 1:

Idiopathic enlargement;

24 years female patient was referred from Department of Orthodontics regarding enlargement in mandibular anterior

region. The patient was giving history of gradual, painless gingival enlargement since orthodontic treatment has started. The patient was unhappy with the gingival enlargement & wanted correction of the same. The enlargement was fibrotic in consistency which was excised by gingivectomy. (**Ref. Figure 1- Figure 3**)

Surgical procedure; After administration of local anesthesia, incision was started apical to the points marking the course of pockets. The incision was beveled approximately at 45 degrees to the tooth surface to recreate normal festooned pattern of gingival. Excised pocket wall was removed & granulation tissue was removed.

CASE 2:

Gingival abscess: 30 years male patient was referred to Department of Periodontics from Dept of Endodontics with the chief complaint of gingival swelling in relation with upper left front region. The patient was undergoing root canal therapy with upper left canine. On clinical examination, it was found that patient was having proximal caries with upper left canine. Also, zinc oxide eugenol dressing was forcibly packed into the prepared cavity which was impinging on the gingiva.

The swelling was oval in shape, edematous in consistency with mild, intermittent pain on mastication. The zinc oxide eugenol dressing was removed & thorough scaling & root planing was done in that area & the patient was called after 1 week. On examination, resolution of abscess was seen. (Ref. fig. 4-fig. 5)

DISCUSSION

In the above cases, dental treatment modalities have become iatrogenic either due to negligence on the part of the dentist or choice of a wrong treatment plan. Various other factors should also be considered during various dental treatments that can be detrimental to periodontal tissues. These factors are discussed in detail as follows:

1) Margins of restorations;

Overhanging margins of dental restorations contribute to the development of periodontal disease by: changing the ecologic balance of the gingival sulcus to an area that favors the growth of disease-associated organisms (predominantly gram-negative anaerobic species)¹, & inhibiting the patient's access to remove accumulated plaque.

The location of gingival margin for a restoration is directly related to the health status of adjacent periodontal tissues. Numerous studies have shown a positive correlation between margins located apical to marginal gingiva & the presence of gingival inflammation². Subgingival margins are associated with large amounts of plaque, more severe gingivitis & deeper pockets. Margins placed at the level of gingival crest induce less severe inflammation, whereas supragingival margins are associated with a degree of periodontal health similar to that seen with nonrestored interproximal surfaces.

2) Contours & Open contacts;

Over contoured crowns & restorations tend to accumulate plaque & possibly prevent the self-cleansing mechanisms of the adjacent cheek, lips & tongue³. Restorations that fail to re-establish adequate interproximal embrasure spaces are associated with papillary inflammation. Undercontoured crowns that lack a protective height of contour may not be as detrimental during mastication as once thought⁴.

The integrity & location of the proximal contacts along with the contour of the marginal ridges & developmental grooves typically prevent interproximal food impaction. Food impaction is the forceful wedging of food into periodontium by occlusal forces. Cusps that tend to wedge food forcibly into interproximal embrasures are known as plunger cusps. The classic analysis of factors leading to food impaction was made by Hirschfield,⁵ who recognized the following factors: uneven occlusal wear, congenital morphologic abnormalities, improperly constructed restorations & opening of the contact point as a result of loss of proximal support or from extrusion.

MATERIALS

In general, restorative materials are not inherently injurious to the periodontal tissues. One exception to this may be self-curing acrylics⁶. The composition of plaque formed on all types of restorative materials is similar, with the exception of that formed on silicate. Although surface textures of restorative materials differ in their capacity to retain plaque,

all can be adequately cleaned if they are polished & accessible to methods of oral hygiene. Access for oral hygiene is impeded by excessive pontic-to-tissue contact, thereby contributing to plaque accumulation, which will cause gingival inflammation & possibly formation of pseudo pockets⁷.

1. **Design of Removable Partial Dentures:** After the insertion of partial dentures, the mobility of the abutment teeth, gingival inflammation & periodontal pocket formation increase,⁸ because partial dentures favor the accumulation of plaque, particularly if they cover the gingival tissue. Partial dentures that are worn during both night & day induce more plaque formation than those worn only during the day. The presence of removable partial dentures induces not only quantitative changes but also qualitative changes, promoting the emergence of spirochetal microorganisms⁹.
2. **Restorative Dentistry Procedures:** The use of rubber dam clamps, matrix bands, & burs in such a manner as to lacerate the gingiva results in varying degrees of mechanical trauma & inflammation. Forceful packing of a gingival retraction cord into the sulcus to prepare subgingival margins on a tooth or for the purpose of obtaining an impression may mechanically injure the periodontium & leave behind impacted debris capable of causing a foreign body reaction.
3. **Toothbrush Trauma:** Abrasions of the gingiva as well as alterations in the tooth structure may result from aggressive toothbrushing. The gingival changes attributable to toothbrush trauma may be acute or chronic. The acute changes vary in their appearance & duration, from scuffing of the epithelial surface to denudation of underlying connective tissue with the formation of painful gingival ulcer. A forcibly embedded toothbrush bristle may be retained in the gingiva & cause an acute gingival abscess. Improper use of dental floss may result in lacerations of the interdental papilla.
4. **Periodontal Complications Associated with Orthodontic Therapy:** Orthodontic therapy may affect the periodontium by favoring plaque retention, by directly injuring the gingiva as a result of overextended bands, & by creating excessive forces, unfavorable forces, or both on the tooth & supporting structures.

Orthodontic treatment is started soon after eruption of the permanent teeth, when the junctional epithelium is still adherent to the enamel surface. Orthodontic bands should not be placed beyond the level of attachment because this will detach the gingiva from the tooth & result in apical proliferation of the junctional epithelium, with an increased incidence of gingival recession¹⁰.

The use of elastics to close diastema may result in severe attachment loss as the elastic migrate apically along the root. Surgical exposure of impacted teeth & orthodontic-assisted eruption may compromise the periodontal attachment on adjacent teeth. It has been reported that the dentoalveolar gingival fibers located within the marginal & attached gingiva are stretched when teeth are rotated during orthodontic therapy¹¹. Surgical severing or removal of these gingival fibers in combination with a brief period of retention may reduce the

incidence of relapse after orthodontic treatment intended to realign rotated teeth.

CONCLUSION

As described in the above article, the therapeutic goals of patient comfort, function, esthetics, predictability, longevity, and ease of restorative & maintenance care are attainable only by a carefully constructed interdisciplinary approach, with accurate diagnosis & comprehensive treatment planning serving as cornerstones.

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Figure 1: Pre-operative facial view



Figure 2: Intra-operative facial view



Figure 3: 1 week post-operative facial view



Figure 4: Pre- scaling & curettage left lateral view



Figure 5: 1 week post scaling & curettage left lateral view

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