

Interdisciplinary Dental Management of a Patient with Generalized Stage III Periodontitis and Traumatic Oral Lesion. A Case Report

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Abstract

Background: Generalized stage III periodontitis is a severe form of periodontal disease distinguished by significant clinical attachment loss, deep periodontal pocket, and bone destruction. Traumatic oral lesions are injuries or damage to the oral tissues brought on by repeated exposure to trauma or chemical agents. Although traumatic lesions are not directly related to periodontal disease, their existence adds complexity to the treatment plan, requiring comprehensive strategies to restore oral health effectively.

Objective: This case report outlines the clinical outcomes, diagnostic procedures, and interdisciplinary treatment approaches for a 65-year-old patient with generalized stage III periodontitis and a traumatic oral lesion. Emphasis is placed

on restoring periodontal health, resolving the traumatic oral lesion, and enhancing overall oral health through coordinated treatment modalities.

Conclusion: Interdisciplinary collaboration is crucial for managing intricate oral conditions. By integrating the expertise of periodontists, oral surgeons, and prosthodontists, we can develop a thorough treatment plan tailored to address the unique challenges present, restore periodontal health, resolve the traumatic oral lesion, achieve optimal outcomes, and ultimately improve the overall well-being and quality of life for affected individuals.

Keywords: Interdisciplinary collaboration, periodontitis, stage III, traumatic oral lesion.

Introduction

Chronic periodontitis poses a major public health concern due to its high prevalence, affecting around 42% of the population in the United States. [1] This condition is characterized by irreversible inflammation and multifactorial pathology, leading to progressive degeneration of periodontal supporting structures. It is primarily distinguished by the loss of support provided by periodontal tissue, which is seen radiographically by alveolar bone loss and clinically by clinical attachment loss (CAL), deep periodontal pockets, and gingival bleeding. [2] Chronic periodontitis significantly diminishes the quality of life of affected individuals as it exerts adverse impacts on both oral functionality and aesthetics. [3] Consequently, effective treatment is imperative to enhance the overall well-being and quality of life of the affected individuals.

Traumatic oral lesions are injuries or damage to oral tissues brought on by continuous exposure to trauma or chemical agents. [4] It is prevalent in dentistry and can represent a wide range of conditions, from acute ulcers to chronic alterations in the mucosa. These lesions can affect oral function and confound diagnosis, especially in chronic cases. They manifest as tissue overgrowth, ulcers, or white or red patches. However, the prompt detection and elimination of the contributing factors are essential for a successful treatment. [5]

Although traumatic oral lesions may not be directly linked to periodontal disease, their existence poses a significant challenge and adds complexity to the treatment plan. Addressing both conditions concurrently demands

thorough understanding of the unique characteristics of each condition and requires multifaceted strategies to effectively restore the over-all oral health.

Case Report

A 65-year-old male presented to the University of Illinois at Chicago (UIC), College of Dentistry, in September 2021, complaining of "mobile lower anterior teeth and a painful oral lesion on his left lateral border of the tongue that appeared two weeks ago". First, complete medical and dental histories were obtained from the patient. Dental records showed root canal treatment on teeth #19 and #30, screw posts and porcelain fused to metal (PFM) crowns on these teeth, and extraction of teeth #1, 9, 16, 17, and 32. Regarding medical history, the patient was medically fit with no medications taken. Note that the patient is a heavy smoker (5 pack-years). Upon clinical examination, grade III mobility was noted on teeth #18, #19, and #23-26. Grade II mobility was also noted on teeth # 2, #3, #14, #15, #30 and #31. Moreover, an erythroleukoplakic lesion with central ulceration was noted on the left lateral border of the tongue adjacent to tooth #18 with a broken lingual cusp (Figure 1).



Figure 1: Erythroleukoplakic lesion with central ulceration on the left lateral border of the tongue adjacent to tooth #18

The initial differential diagnosis of the oral lesion included the possibility of a traumatic irritation to the left lateral border of the tongue due to the sharp lingual cusp on tooth #18. However, the heavy smoking history, along with the erythroleukoplakic nature of the lesion in a high-risk area of the mouth, raised suspicion of malignancy. Thus, the patient was referred to the surgical department at

the UIC to rule out malignancy risk. The panoramic radiological imaging (figure 2 a), along with periapical x-rays done on the right and left molar areas (figure 2 b), confirmed the severe angular bone resorption on teeth #18, #19, and #31, moderate horizontal bone resorption on teeth #2, #3, #14, #15, and #30, and severe horizontal bone loss on teeth #23-26 with furcation involvement on all molars.

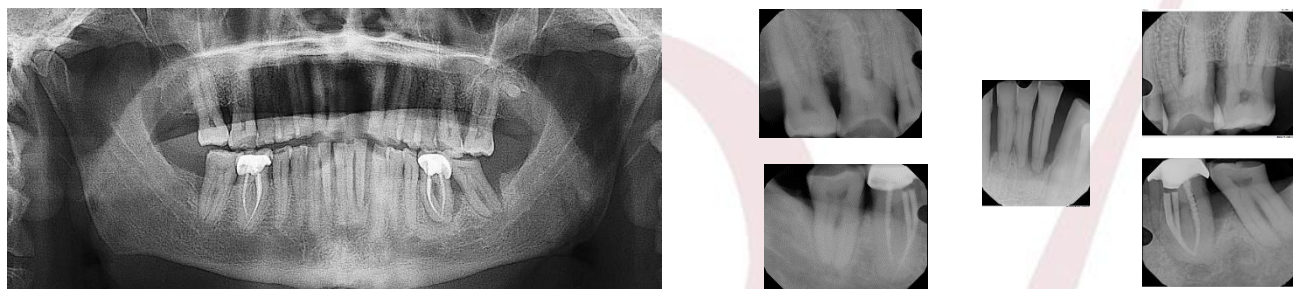


Figure 2: Radiographic imaging showing the bone loss around molars and lower anterior teeth, a: panoramic x-ray, b: periapical x-rays

At the surgical department, an incisional biopsy was taken and sent to the lab for pathological and histological examination. After three weeks, the pathological report of the biopsy taken confirmed the finding of a hyperkeratotic leukoplakia of the left lateral border of the tongue approximating 2cm x 1 cm dimension with central ulceration.

The histological report indicated a squamous epithelium with mild dysplasia with no malignancy indicated. The patient was informed and educated about the pathological and histological results, and the sharp cusp of tooth #18 was smoothed. At the two-week follow-up visit, the tongue lesion healed. After that, the patient was referred to the periodontal department at the UIC to examine the periodontal status of the patient's dentition. At the UIC periodontal department, the periodontal evaluation indicated inflamed, soft, and spongy gingiva with blunted papilla and marginal erythema and edema, generalized heavy plaque and calculus deposition, and purulent exudate around teeth #23-27, #18, and #19.

Moreover, the periodontal charting showed generalized bleeding on probing (BOP), probing depths of more than 6 mm on teeth #2, #3, #14, #15, #18, #19, #23-26, #30, and #31, furcation involvement on teeth #2, #3, #14, #15, #18, #19, #30 and #31, and CAL of more than 5 mm on all molars. Considering the patient's smoking history alongside the radiographic and periodontal findings, the case was diagnosed as generalized stage III periodontitis grade C. The prognosis was hopeless for teeth #14, #15, #18, #19, and #23-26, and questionable for teeth #2, #3, #30, and #31.

Regarding treatment for this case, professional mechanical plaque removal (PMPR) was initially recommended for all four quadrants, along with the extraction of hopeless teeth #14, #15, #18, #19, and #23-26. Four weeks later, the periodontal status was stable, and the extraction wounds healed properly (Figure 3), so we decided to move forward with the restorative part. Ideally, in order to restore function and esthetics, the missing teeth should be replaced by implants and implant-supported prostheses.



Figure 3: Four weeks follow up intraoral pictures showing the improved periodontal status of the gums and proper healing on the extraction sites (upper and lower left molars and lower incisors).

However, considering the financial status of the patient, this choice was not suitable. Thus, the treatment plan was modified to include fixed porcelain fused to metal (PFM) three-unit bridge extending from teeth #8-10 to replace the missing upper central incisor #9 and removable partial dentures (RPD) for the upper and lower edentulous ridges. On the first restorative visit, alginate impressions were taken on both arches to fabricate diagnostic casts. On the upper diagnostic cast, a wax-up for the upper missing tooth #9 was done (Figure 4 a). While on the mandibular cast, a wax rim with Frasco typodont teeth was fabricated to recreate the missing anterior teeth and provide an accurate record for the maxillary fixed bridge (figure 4 b). Both upper and lower diagnostic casts were mounted on Denar 320 semi-adjustable articulator (figure 4 c). In the next visit, teeth #8 and #10 were prepared for the fixed bridge with proper incisal clearance (figure 4 d). An

anterior guide plane with acrylic on the incisal table was fabricated in order to record and reproduce the anterior centric and eccentric movements. The final impression, along with the mounted casts and acrylic guide plane, were sent to the lab to fabricate the removable partial prosthesis. A temporary provisional bridge was fabricated in between visits to protect the prepared teeth and for better esthetics (figure 4 e). In the subsequent appointment, the metal framework for the upper fixed bridge was tried in the patient's mouth. The proper fit was confirmed clinically and radiographically (figure 4 f). Shade was selected according to the patient's desire (A 3.5; Vita Guide Shade) and the metal framework was sent back to the lab for porcelain addition. On the delivery visit, the upper fixed bridge was tried on. Proper contour, contacts, and fit were checked clinically and radiographically (figure 4 g). After that, the bridge was cemented with resin-modified glass

ionomer (RMGI) Fuji CEM (figure 4 h). Following that, impressions for both arches along with bite registration were taken and sent to the lab to fabricate upper and lower metallic RPDs (figure 4 i). The lab first sent back the metal framework to check its fit intraorally. After confirming proper fit, the upper and lower metallic

frameworks were sent back to the lab to set the teeth. RPDs with teeth set in wax were sent back for try-in. In the try-in visit, the occlusion and teeth alignment were checked (figure 4j & k), and RPDs were sent back to the lab for final processing.



Figure 4: prosthetic treatment; a: wax up for the upper missing tooth #9, b: lower wax rim with Frasaco typodont teeth, c: diagnostic casts mounted on Denar 320 semi-adjustable articulator, d: prepared teeth #8 and #10 fixed bridge, e: temporary provisional bridge for teeth #8-10, f: metal framework fit of the fixed bridge checked radiographically, g: PFM bridge fit checked radiographically, h: PFM bridge cemented, i: final impressions for metallic RPD, j & k: RPD teeth try-in.

Finally, at the final visit, processed RPDs were tried and delivered to the patient (figure 5). The patient expressed satisfaction and joy upon regaining both oral function and aesthetic appearance. (Figure 6)



Figure 5: Delivery of the upper and lower metallic RPDs



Figure 6: Patient's extra oral pictures before and after

Discussion

Traumatic oral lesions resulting from continuous exposure to trauma or chemical agents cause injuries and damage to oral structures. [4] Most of these lesions are harmless and typically resolve on their own within weeks once the causative agent is removed. In this case, the constant irritation presented from the sharp lingual cusp of tooth #18 precipitated the development of a red and white traumatic oral lesion with central ulceration. However, the patient's significant history of heavy smoking and the erythroleukoplakic appearance of the lesion in a high-risk oral area (lateral border of the tongue) prompted the need for a biopsy to exclude malignancy.

Periodontal diseases are globally prevalent, affecting around 20-50% of populations in developed and developing nations. Its high prevalence among adolescents, adults, and the elderly underscores its significance as a major public health issue. [6] In the United States, 42% of the population has chronic periodontitis. [1] The gold standard treatment in chronic periodontitis cases is professional mechanical plaque removal (PMRP). Recently, new strategies, including systematically or locally administered antibiotics and antiseptics, as well as platelet concentrates, have been used to improve PMRP results and substitute the need for periodontal surgery. [2]

According to the 2017 World Workshop Classification system for periodontal and peri-implant diseases and conditions, generalized stage III periodontitis is characterized by multiple significant features that impact 30% or more of the present dentition. These include CAL exceeding 5mm, radiographic bone loss extending to the middle third of the root and beyond, loss of at least four teeth due to periodontitis, probing depths surpassing 6mm, vertical bone loss exceeding 3mm, and furcation involvement. [7] In this case report, the patient presented with CAL greater than 5mm and probing depths greater than 6mm on most molars, radiographic bone loss extending to the middle third of the root on teeth #2, #3, #14, #15, #30, and #31 and the apical third on teeth #18, #19, and #23-26. Also, furcation involvement was noted on all molars and the loss of the four left molars #14, #15, #18,

and #19 due to the periodontal disease. This classified the case as generalized stage III periodontitis. Regarding grading, the patient's heavy smoking habit (more than ten cigarettes/day) and the rapid rate of destruction graded the case as grade C.

Treating generalized stage III periodontitis typically begins with the gold standard PMRP for all four quadrants of the mouth. Recently, several strategies have emerged to improve PMRP outcomes, potentially circumventing the need for periodontal surgical intervention. These encompass systemic or localized administration of antibiotics and antiseptics (ex: hyaluronic acid, minocycline, metronidazole...), as well as the use of platelet concentrates. [2] After establishing a stable periodontal apparatus, the best way to compensate for the loss of teeth due to periodontitis is implant and implant-supported prostheses, offering both preservation of neighboring teeth and enhanced bone maintenance in edentulous areas. [8] However, the substantial-high cost associated with such treatment is sometimes challenging. In this case, the patient's financial constraints precluded the adoption of the proposed treatment plan. Subsequently, alternative options, including fixed and removable prostheses, were recommended instead.

To compensate a missing upper left central incisor, the gold standard line of treatment is the PFM fixed bridge with a survival rate exceeding 95% over a 10-year period. [9] PFM bridges offer good esthetics, strong mechanical properties, cost-effectiveness, and the necessary biological compatibility for periodontal health. However, the visibility of the metal framework limits its use in some cases. [10] Moreover, in this case, after replacing the missing upper central incisor #9, the upper arch is classified as Kennedy Class II, while the lower arch is classified as Kennedy Class II modification 1. [11] To restore these edentulous areas, the conventional treatment approach involves the fabrication of metallic RPDs, demonstrating a 75% survival rate over a 5-year period and 50% over a 10-year period. [12] Metallic RPDs offer proper strength, durability, minimal thickness, and reliable support for missing teeth while ensuring long-term functionality. [13] Nevertheless, the long-term success of

RPDs hinges on patient education, proper oral hygiene and denture care, and effective patient-dentist communication. [14]

Conclusion

In conclusion, effectively managing a case involving generalized stage III periodontitis alongside a traumatic oral lesion underscores the effectiveness of an interdisciplinary approach in managing complex dental conditions. By harnessing the collective expertise of periodontists, oral surgeons, and prosthodontists, we can develop a comprehensive treatment strategy tailored to address the distinct challenges present, fostering periodontal health restoration, traumatic oral lesion resolution, and ultimately enhancing the overall well-being and quality of life for affected individuals.

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