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Case Report

Non-surgical Periodontal Management of Severe Generalized Gingival Enlargement in a Human Immunodeficiency Virus-positive Patient: A Case Report

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Abstract

Acquired immunodeficiency syndrome is a condition characterized by profound impairment of the immune system caused by a viral pathogen, human immunodeficiency virus (HIV). HIV seropositive individuals have increased susceptibility towards oral and periodontal lesions. Non-surgical periodontal therapy (NSPT) is a cause-related therapy aimed at elimination of etiologic factors forming first line treatment for periodontal disease. The case report describes a 32-year-old HIV-positive female patient presenting with generalized gingival enlargement, on highly active anti-retroviral therapy for the past 7 years and with a stable systemic condition. The gingival enlargement was severe and generalized accompanied by bleeding, exudation, and loss of masticatory function. Scaling and root planing was performed following the strict protocol for HIV patients to prevent cross-infection. Complete resolution of the enlargement occurred after which maxillary central and mandibular central and lateral incisors were extracted due to their hopeless prognosis. After the establishment of a healthy periodontium, prosthodontic rehabilitation of the missing teeth was done to re-establish normal function and esthetics. NSPT and fixed prosthetic rehabilitation successfully established a healthy periodontium along with a functional dentition with a high level of patient satisfaction maintained over 1.5 years follow-up.

Key words: Human immunodeficiency virus, Inflammatory gingival enlargement, Non-surgical periodontal therapy

INTRODUCTION

Acquired immunodeficiency syndrome (AIDS) is a condition characterized by profound impairment of the immune system first reported in 1981 and a viral pathogen, the human immunodeficiency virus (HIV) was identified in 1984. HIV virus has a strong affinity for cells of the immune system, especially those that carry the CD4 cell surface receptor molecule.[1]

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AIDS has emerged as a global pandemic in the past two decades. According to the United Nations AIDS (UNAIDS), a total number of people living with HIV/AIDS in 2014 worldwide were 36.9 million.[2] In India, a prevalence rate of 0.3% has been reported among the adult population, by the UNAIDS report 2014.[2] HIV infection results in progressive depletion of the CD4 cell count. According to Centre for Disease Control, CD4 count <200 cells/mm^3 or the manifestation of life-threatening infections is termed as outright AIDS.[3]

Oral lesions are common in HIV-infected patients although geographic and environmental variables exist. Five cardinal oral lesions strongly associated with HIV infection identified internationally are as follows: Oral candidiasis, oral hairy leukoplakia, Kaposi's sarcoma, periodontal diseases (linear gingival erythema, necrotizing

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ulcerative gingivitis, and periodontitis), and non-Hodgkin lymphoma.[4,5] HIV infection in adults is linked to the expression of various types of periodontal lesions that include specific forms of gingival and necrotizing periodontal disease as well as possible exacerbations of preexisting periodontal disease. HIV infection is generally recognized as a risk factor for chronic periodontal disease although epidemiological studies have failed to confirm a causal link. The prevalence of periodontal disease in HIV-seropositive patients has been 36.11% as reported by Ravi and Rao[6] and 33% as concluded by Ranganathan *et al.*[7] in India. After the introduction of highly active antiretroviral therapy (HAART), there has been a significant decrease in the overall prevalence of oral manifestations from 45% to 85% to about 32-46%.[8] When considering the relationship between CD4 count and frequency of oral lesions, CD4 counts can be considered a risk factor for the development of oral lesions especially oral candidiasis.[9]

Gingival enlargement is the increase in size of the gingiva which is a common feature of gingival disease.[1] It is caused by several factors, most commonly being inflammation, certain drugs, systemic diseases or conditions, and inheritance.[10] Inflammatory enlargement is the most common type of gingival enlargement associated with accumulation of plaque and calculus resulting in slight ballooning of interdental papillae and marginal gingiva. This chronic inflammatory enlargement may progress slowly and painlessly along with exudative and proliferative changes.[1] The proliferating gingival enlargement favors plaque accumulation and retention that further aggravates the gingival enlargement along with bone loss, mobility of teeth, pathologic tooth migration and esthetic disfigurement, culminating in loss of masticatory function.

Dental therapy in a HIV-positive patient has been challenging due to the fear of infection which is cited as the main reason for reluctance to treat HIV-positive patients by dentists.[11] Oral and periodontal surgical treatment in HIV-infected individuals has been associated with the risk of infection, delayed wound healing, persistent bleeding, and pain.[12,13] Among the other dental treatments provided, prosthetic rehabilitation is an integral part and although the prosthodontists are confronted with an increasing number of HIV-infected patients; there remains uncertainty with regard to appropriate management protocol for them.[14]

This case report demonstrates a HIV-positive female patient presenting with a severe generalized gingival enlargement which was treated solely by non-surgical periodontal therapy (NSPT) followed by prosthetic rehabilitation which was followed-up over 1½ years.

CASE REPORT

A 32-year-old female patient reported to the out-patient department, Department of Periodontics, KLE Vishwanath Katti Institute of Dental Sciences, Belagavi, Karnataka, India, in May 2015 with a chief complaint of swollen gums since 1½ years. The patient initially started experiencing bleeding from the gums on toothbrushing and eating. Due to the chronic bleeding while brushing, she quit brushing with a toothbrush. Gradually, she started to develop swelling of the gums in the maxillary and mandibular anterior region that was spreading posteriorly, to involve the entire gingiva. The patient developed difficulty in mastication and was also concerned about the esthetic disfigurement resulting over time. Medical history revealed that the patient was diagnosed as HIV positive 7 years ago and had been on HAART, composed of a fixed drug combination of lamivudine (150 mg), nevirapine (200 mg) and zidovudine (300 mg) twice daily and had well-maintained systemic health. Her CD4 counts ranged between 450 and 700 cells/mm^3 and were checked bi-annually as a protocol.

Intraoral examination revealed poor oral hygiene (OHI-S score – 4.3) characterized by moderate to severe plaque and calculus, generalized gingival enlargement varying between Grade 2 and 3 (Bokenkemp and Bonhorst, 1994) accompanied by spontaneous bleeding, pus exudation and soft edematous gingiva. Pathologic migration was seen in relation to maxillary central incisors and grade 2 mobility was present in relation to maxillary central incisors and mandibular incisors (Figure 1a-d). Deep bite and slight extrusion of the mandibular incisors resulted in chronic trauma to the palatal mucosa. Generalized pockets ranging from 5 to 8 mm were present, majority being pseudo pockets. Pit and fissure caries was present in relation to all

Figure 1: Pre-treatment photographs. (a) Frontal view showing Grade 2 to Grade 3 gingival enlargement. (b) Right lateral view showing Grade 3 gingival enlargement. (c) Left lateral view showing pathologic migration and extrusion with 11, 21. (d) Mandibular occlusal view showing an irregular, diffused gingival enlargement lingually as well as facially with visible pus exudation

the first molars. Radiographic findings revealed severe bone loss in relation to maxillary central and mandibular central and lateral incisors and moderate interproximal bone loss between mandibular right second premolar and first molar.

Based on the clinical and radiographic examination, a diagnosis of chronic generalized inflammatory gingival enlargement with localized periodontitis (AAP 1999 classification) was made.

The periodontal treatment plan included patient education and motivation for oral hygiene maintenance, correction of brushing technique and scaling and root planing for the removal of local etiologic factors.

Standard precautions for prevention of HIV transmission were followed throughout the treatment procedure which included good hand hygiene practices and use of protective barriers such as disposable gloves, mask, eyewear, and gown during routine patient care.

Scaling and root planing were performed over three sittings following the standard precautions for the treatment of HIV patients using the HIV-AIDS kit (EXCELLENT ASEPTIC PRECAUTION PRODUCTS, Madurai, India). Before the initiation of scaling, a pre-procedural mouthrinse was performed using 0.2% chlorhexidine. Ultrasonic scaling was followed by subgingival irrigation with 5% povidone-iodine (bectadine) and saline, in equal mixtures. The patient was advised home gargles with 2% povidone iodine (betadine) mouthrinse twice daily, for reducing the microbial load and bleeding. The patient was motivated to start brushing with a soft toothbrush to prevent gingival trauma.

About 4 weeks following ultrasonic scaling, a significant reduction of the gingival enlargement occurred following which thorough root planing was performed as the subgingival deposits became visible and accessible.

On completion of NSPT, 2% povidone-iodine mouthrinse was replaced by 0.2% chlorhexidine mouthrinse, twice daily as an adjunct to the mechanical plaque control measures. At 4 week re-evaluation, a healthy pale pink gingiva with knife-edge margins and stippled surface texture was established (Figure 2a-c). An isolated periodontal pocket of 6 mm persisted in the interproximal region between the mandibular right second premolar and first molar. The pocket was treated non-surgically by local drug delivery of tetracycline. Collagen fibers impregnated with tetracycline (Periodontal Plus AB™) were placed within the pocket, after which it was sealed with PeriAcryl® 90 (GLUSTICH, Canada) and covered with a periodontal pack (COE-PAK™, GC, USA). The pocket was re-evaluated after 8 weeks and a probing depth of 4 mm was attained after local drug delivery (Figure 3a-c).

Extraction of maxillary central and mandibular central and lateral incisors was planned due to their poor prognosis. After obtaining physician's consent, extraction of the indicated teeth was performed under prophylactic antibiotic coverage (amoxicillin 500 mg). Post-extraction, metronidazole (400 mg) was prescribed in addition to amoxicillin (500 mg) for 5 days.

The post-extraction healing of oral tissues was excellent and without any complications, as opposed to the expected delayed healing and increased risk of infection and complication in HIV-positive patients (Figure 4).

Figure 2: 3 Months post non-surgical periodontal therapy (NSPT). (a) Frontal view showing resolution of gingival enlargement at 3-months post NSPT. (b) Left lateral view showing pathologic migration and extrusion with 11, 21 and severe deep bite. (c) Mandibular occlusal view with resolution of gingival enlargement

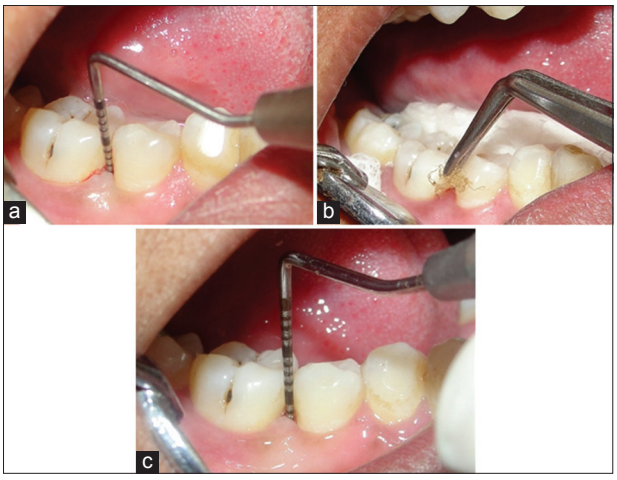

Figure 3: Local drug delivery. (a) 6 mm periodontal pocket in the interproximal region between 45, 46. (b) Placement of biodegradeable tetracycline fibers after root planing (periodontal AB plus). (c) 8 week re-evaluation shows a reduced pocket probing depth to 3 mm

Six weeks following extractions, the gingiva and the supporting periodontal tissues were re-evaluated for prosthetic rehabilitation of the patient. Considering patient's young age, good compliance, good current systemic health and prognosis of the remaining teeth, a fixed prosthetic replacement of the missing teeth were planned. All the carious pits were excavated and restored with glass ionomer cement (GIC) (GC Gold Label 2, Japan) before prosthetic treatment.

After completion of the periodontal and restorative treatment, tooth preparation was done with maxillary lateral incisors and mandibular canines to receive porcelain fused to metal restorations with anterior teeth. The margins were kept supragingival to avoid trauma to the gingival tissue which could lead to infection and complication. Two-stage addition silicone putty-light body impressions were made and rinsed under running tap water and then immersed in a disinfectant solution (Korsolex® Rapid, Raman & Wiel, India). Previously fabricated temporary restorations were cemented using temporary luting cement (Temp-Bond, Kerr Corporation) until the final prosthesis was delivered. A Ni-Cr alloy framework was prepared and tried in patient's mouth to assess the fit followed by ceramic (VITA Zahnfabrik, Germany) over the prostheses. Bisque trial was done to evaluate the shade matching, margin adaptability and visibility in the patient's mouth. This was followed by final glazing and cementation of fixed dental prosthesis using type 1 GIC (GC Gold Label 1, Japan). 1- and 3-month follow-up was found to be satisfactory in terms of function and esthetics (Figure 5a-d).

All the re-usable equipment such as ultrasonic scaler handpiece (EMS Mini Piezon), scaler tips, airotor handpiece (AppleDent, China), tooth preparation burs (Inlay & Crown Preparation kit, Diatech, USA), diagnostic instruments, metal impression trays, and face bow were properly cleaned, autoclaved and reprocessed (Figure 6). All sharp items (especially needles) and blood-soaked gauze, which are potentially infective were handled and disposed-off following strict protocol. At the end of each appointment, countertops and surfaces that may have become contaminated with blood or saliva were wiped with absorbent towels and then disinfected with a solution of sodium hypochlorite (1:10 dilution of household bleach) followed by fumigation with formaldehyde (500 ml formaldehyde diluted in 1000 ml of water in an electric boiler).

DISCUSSION

The frequency of oral lesions has greatly diminished with the advent of HAART along with reduction in the viral load and overall improvement in immune function and quality of life.

Figure 4: 1 Week postextraction showing excellent healing following extraction of 11, 21, 31, 32, 41 and 42

Figure 5: 3 months post-prosthetic treatment follow-up, showing excellent gingival condition maintained over 1.5 years and functionally and esthetically harmonius prosthesis. (a-c) Right lateral, left lateral, and frontal post-treatment photographs. (d) Post-treatment mandibular occlusal photograph showing a healthy gingival condition with all carious lesions restored

Dental treatment of HIV-infected individuals is especially challenging due to the risk of infection to the operator, supporting staff as well as the patient. Periodontal treatment includes non-surgical as well as surgical treatment modalities. Non-surgical therapy involves elimination of the etiologic factors and forms the first line of the treatment. NSPT is followed when tissues fail to respond to non-surgical therapy as well as when correction of morphologic abnormalities, esthetics and mucogingival defects is indicated.

Depending on the etiology, gingival enlargements can be inflammatory, fibrotic or fibrotic superimposed by inflammatory. Chronic inflammatory enlargements are soft in consistency and bleed easily, principally caused by edema and cellular infiltration. Fibrotic enlargement results from a distinct pathologic process induced by

Figure 6: Preparation of treatment table with HIV virus Z Kit – disposable surgeon's gown, patient's drape, protective eyewear, handpiece, sterile gloves and mask

drugs, genetic factors or systemic conditions. Selection of the appropriate treatment technique depends on size of the enlargement and character of the tissue. Chronic inflammatory enlargements undergo shrinkage with complete removal of deposits whereas enlargements with a significant fibrotic component do not undergo shrinkage after scaling and root planing, hence surgical removal is a treatment of choice. In the present case, the gingival enlargement was soft and edematous, hence scaling and root planing along with subgingival irrigation was done to eliminate etiologic factors.

A moderate isolated pocket of 6 mm was present in the interdental region between right mandibular second premolar and first molar, which was treated by local drug delivery of tetracycline. There was a reduction in the pocket depth and absence of bleeding, suggestive of re-establishment of periodontal health.

Implant therapy is not an absolute contraindication in immunocompetent HIV-positive individuals, as suggested by Achong *et al.*[15] and Oliveira *et al.*[16] Considering the economic condition of the patient and treatment duration required for implant therapy, fixed partial denture prosthesis was considered as the best treatment option.

While dealing with HIV patients, it is more important to prevent trauma to the tissues as it may lead to infection and other complications. Hence, it is wise to have supragingival margins, use simple gingival retraction methods and avoid bleeding during procedures.[14] In view of this case, the gingival condition entailed minimal trauma, therefore a supragingival margin was given. In addition, supragingival margins are associated with the ease of impression making and oral hygiene maintenance.

Along with active treatment, maintenance and preventive program form an integral and definitive step in patient care which solicits considerable time and effort by the dentist and the patient. The present case was followed up every month for the first 12 months until a stable gingiva, free from bleeding on probing was obtained, before prosthetic rehabilitation. Following prosthetic rehabilitation, 1- and 3-month follow-up was found to be satisfactory in terms of function and esthetics. The patient was instructed for special plaque control measures, especially around pontics and connectors with the use of a narrow-interdental brush. Each recall appointment included oral hygiene reinforcement, patient education and motivation. Preservation of the periodontal health of treated patients requires a positive maintenance program. Keeping this in mind, the future recall appointments have been scheduled every 3 months, as per Merin's classification for evaluation of oral health.

CONCLUSION

NSPT eliminates the etiologic factors responsible for the development of periodontal diseases and aids in re-establishment of a physiologic gingival contour. SPT is an integral step in the preservation and maintenance of the periodontium and dentition following treatment of periodontal disease.

This case report emphasizes the importance and success of non-NSPT for the treatment of generalized gingival enlargement in an HIV-positive patient which was followed up over 1.5 years. The prosthodontic rehabilitation of the missing teeth to restore normal masticatory function and esthetics was successful, with a high level of patient satisfaction.

Clinical Significance

With the increasing prevalence of HIV-positive individuals seeking dental treatment, it is imperative for dental practitioners to have adequate clinical knowledge and skills to treat such patients with precautions. With the advent of advanced surgical techniques in periodontology, the importance of NSPT has been gradually fading. This case report demonstrates the importance and success of NSPT in the treatment of gingival enlargement and the special treatment and aseptic protocols to be followed for HIV-positive patients.

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