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Marginal gingivitis and linear gingival erythema associated with HIV patient treated with a combination of hydrogen peroxide and chlorhexidine gluconate mouthwash: A case report

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ABSTRACT

Marginal gingivitis is a common form of periodontal disease that can be associated with human immunodeficiency viruses (HIV) infection. It is characterized by inflammation, bleeding, and plaque accumulation. We report a case of a 78-year-old male patient with HIV infection who presented with chronic marginal gingivitis and linear gingival erythema (LEG). The patient was treated with hydrogen peroxide mouthwash for 2-3 weeks. The gingival condition improved significantly after two weeks of treatment. This case illustrates the successful management of marginal gingivitis and LGE associated with HIV infection through non-surgical periodontal therapy and using hydrogen peroxide (1.5%) and chlorhexidine gluconate (0.2%) mouthwash alongside a systematic approach using anti-retroviral therapy.

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INTRODUCTION

Marginal gingivitis is a common form of periodontal disease that affects the gingival margin and interdental papillae[1]. It is characterized by inflammation, bleeding, and plaque accumulation. Marginal gingivitis can be associated with various systemic conditions, such as diabetes mellitus, hormonal changes, and human immunodeficiency viruses (HIV) infection [2].

HIV infection is a viral disease that causes immunosuppression and increases the risk of opportunistic infections and malignancies. The epidemiology of HIV infection describes the distribution and determinants of the virus and its associated morbidity and mortality in human populations. According to the latest estimates from UNAIDS, there were 37.7 million people living with HIV globally at the end of 2020, of whom 27.4 million were receiving antiretroviral therapy (ART) [3]. The majority (95%) of people living with HIV were in low- and middle-income countries, with Africa accounting for 68% of the global total. The region also had the highest prevalence (8.9%) and incidence (1.1%) of HIV infection among adults aged 15 to 49 years [3].

The impact of HIV infection on the immune system is mainly mediated by its effect on CD4+ T cells, which are essential for coordinating the immune response and helping other cells fight off infections. The infection and destruction of CD4+ T cells by HIV leads to a progressive decline in their number and function, resulting in a compromised immune system that cannot mount an effective response against HIV or other pathogens[4]. The level of CD4+ T cells in the blood (CD4 count) is a marker of immune status and disease progression in HIV infection. A normal CD4 count ranges from 500 to 1500 cells per microliter of blood, while a CD4 count below 200 cells per microliter indicates AIDS [4].

The diagnosis of HIV infection is crucial for initiating appropriate treatment and care, as well as for preventing further transmission of the virus. It is based on testing for the presence of the virus or its components (such as RNA, DNA, or antigens) or the host immune response (such as antibodies) in blood or other specimens. It can be classified into three categories: screening tests, confirmatory tests, and supplemental tests [5].

Oral manifestations are often the first and most important indicators of HIV infection and can predict the progression to acquired immunodeficiency syndrome (AIDS) [6]. Among the oral lesions associated with HIV infection, periodontal diseases are considered serious complications that can affect the quality of life and systemic health of the patient [6,7].

Periodontal diseases associated with HIV infection include liner gingival erythema (LGE), necrotizing ulcerative gingivitis (NUG), necrotizing ulcerative periodontitis (NUP), and necrotizing ulcerative stomatitis (NUS/NS)[8]. LGE is a distinct form of gingivitis that presents as a continuous or interrupted band of erythema along the gingival margin. It may be associated with pain, bleeding, edema, and ulceration. LGE is considered a marker of immunosuppression and may precede the development of NUG, NUP, or NUS/NS[7] .

The management of periodontal diseases in HIV-infected patients involves both local and systemic approaches. Local therapy includes mechanical debridement, irrigation with antiseptic agents, such as hydrogen peroxide or chlorhexidine gluconate, and topical application of antimicrobial agents, such as metronidazole or tetracycline[9,10]. Systemic therapy includes ART, antibiotics, analgesics, and nutritional supplements[10,11]. In this report, we describe a case of marginal gingivitis and LEG associated with HIV infection that was treated with a comprehensive non-surgical periodontal therapy alongside a course of hydrogen peroxide and chlorhexidine gluconate mouthwash.

Case Report

A 78-year-old male patient presented to the oral medicine department with a chief complaint of redness and bleeding of the gums for five months. The patient had been diagnosed with HIV infection eight months ago and had started treatment with ART for almost 3 months. He denied any history of smoking, alcohol consumption, or drug abuse. He reported having multiple sexual partners in the past.

On clinical examination, the patient had a body mass index of 18 kg/m2 and a blood pressure of 126/78 mmHg. He had generalized lymphadenopathy and oral candidiasis on the dorsal surface of the tongue. His oral hygiene was poor, with visible plaque and calculus deposits. He had marginal gingivitis affecting all teeth, with bleeding on probing and pocket depths ranging from 3 to 5 mm. He also had LGE along the maxillary anterior teeth (**Figure 1, a**).

Figure 1: The images show A) Prior Treatment; red, swollen, and ulcerated gingiva with plaque and calculus deposits on the teeth.

The patient was referred to the infectious disease department for further evaluation and management of his HIV infection. His laboratory tests revealed a CD4+ T-cell count of 150 cells/mm3 and a viral load of 100,000 copies/mL. He was prescribed ART consisting of tenofovir disoproxil fumarate/emtricitabine/efavirenz (TDF/FTC/EFV) once daily.

For his periodontal condition, he was treated with a comprehensive course of non-surgical periodontal therapy

which include sub- and supra-gingival debridement under local anesthesia once every week for one month. He was also instructed to rinse his mouth twice daily with 1.5% hydrogen peroxide solution for one minute and rinse his mouth three times daily with 0.2% chlorhexidine gluconate mouthwash for two weeks. He was advised to maintain good oral hygiene by brushing his teeth twice daily with a soft-bristled toothbrush and fluoride toothpaste and flossing daily. He was also given nystatin oral suspension for his oral candidiasis (100.000 units per mL/1 mL taken 4 times a day for 7 days).

Figure 1: The images show B) One week after treatment which includes non-surgical periodontal therapy, smoothing dental restoration, caries control, and construction of removable partial dentures (try in stage).

The patient returned for a follow-up visit after two weeks for a try-in visit for his upper and lower removable partial denture to replace his missing teeth (**Figure 1, b**). He reported improvement in his gingival symptoms, such as reduced bleeding, pain, and redness. He also reported adherence to his ART and periodontal regimen. On clinical examination, his oral hygiene was improved, with less plaque and calculus deposits. His marginal gingivitis and LGE were significantly reduced, with no bleeding on probing and pocket depths ranging from 2 to 3 mm after 3 weeks (**Figure 2**).

Figure 2: Two weeks post-treatment and at the delivery stage of the removable partial denture (RPD).

The patient was scheduled for regular periodontal maintenance visits every three months. He was also encouraged to continue his ART and oral hygiene practices.

DISCUSSION

This case illustrates the successful management of marginal gingivitis and LEG associated with HIV infection using hydrogen peroxide and chlorhexidine gluconate mouthwash. Hydrogen peroxide is an oxidizing agent that has antibacterial, antifungal, and anti-inflammatory properties. It can penetrate the biofilm and disrupt the cell membrane of the microorganisms, leading to cell death.

Hydrogen peroxide has been shown to be effective in reducing the clinical signs and symptoms of periodontal diseases in HIV-infected patients. However, it may also have some adverse effects, such as mucosal irritation, staining of teeth and restorations, taste alteration, and bacterial resistance. Therefore, it should be used with caution and under professional supervision.

Chlorhexidine is an antiseptic agent that has been shown to reduce plaque and gingivitis when used as a mouth rinse [12]. It is often used as an adjunctive treatment to mechanical oral hygiene procedures, such as toothbrushing and flossing [12,13]. Chlorhexidine mouth rinse has been recommended for patients with HIV-associated periodontal diseases, such as LEG and NUG [11].

The patient in this case also benefited from the initiation of ART, which improved his immune status and reduced his viral load. ART has been shown to reduce the prevalence and severity of oral lesions in HIV-infected patients. However, ART may also have some side effects, such as gastrointestinal disturbances, hepatotoxicity, nephrotoxicity, lipodystrophy, and metabolic disorders. Therefore, patients on ART should be monitored regularly for their clinical response and adverse events.

In addition to local and systemic therapy, patients with HIV-associated periodontal diseases should also receive supportive care, such as nutritional counseling, pain management, psychological support, and oral health education. They should also be referred to other specialists as needed for their comorbidities or complications.

CONCLUSION

Marginal gingivitis and LEG associated with HIV infection is a serious condition that can affect the oral and systemic health of patients. It can be managed effectively with a combination of hydrogen peroxide and chlorhexidine gluconate mouthwash, along with ART and supportive care. Dentists play a crucial role in the early diagnosis and treatment of HIV-associated periodontal diseases, as well as in the prevention of their recurrence.

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