



Necrotizing Ulcerative Gingivitis: A Case Report

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Abstract

Necrotizing Ulcerative Gingivitis (NUG) is a severe acute form of periodontal diseases. It is characterized by a rapid onset of interdental gingival necrosis, gingival bleeding and gingival pain. Other systemic factors such as malaise, fever and lymphadenopathy can also be found. The establishment of a rapid diagnosis is very important in order to avoid complications. The treatment of NUG is organized in successive steps and predisposing factors should be taken into account in order to obtain stable outcomes. The present case report describes the diagnosis approach and the treatment of NUG in a 21-year-old female patient.

Keywords: Necrotizing ulcerative gingivitis; Necrotizing periodontal diseases; Diagnosis; Treatment

Introduction

Necrotizing Ulcerative Gingivitis (NUG) is a severe form of acute inflammatory periodontal diseases. It is characterized by the necrosis of the interdental gingiva, gingival bleeding and gingival pain [1]. Since this disease is found especially in military personnel, the true prevalence of the NUG is unknown because most of the studies are based on military recruits and are not representative of the general population [2]. NUG is defined by some clinical symptoms such as edematous, hemorrhagic and inflamed dental papilla. This papilla is usually covered by a white layer with an ulcerated gingival margin surrounded by an erythematous halo. The lesion is limited to the gingival tissue and does not generate any periodontal attachment loss [3]. Halitosis can be detected in the majority of patients, and some systemic symptoms like fever, lymphadenopathy and malaise can also be found [4]. In 1999, the international workshop for the classification of periodontal diseases and conditions proposed a new category of periodontal diseases: Necrotizing periodontal diseases that included both necrotizing ulcerative gingivitis and necrotizing ulcerative periodontitis [5]. According to the new classification of the last world workshop AAP/EFP 2017, necrotizing ulcerative gingivitis has been replaced by the term of necrotizing gingivitis. Also based on the location, necrotizing periodontal diseases have been subdivided into necrotizing gingivitis, necrotizing periodontitis and necrotizing stomatitis [6]. The aim of this paper is to report the management of a case of a 21-year-old female patient diagnosed with NUG associated to stress.

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Received Date: 19 Jun 2023

Accepted Date: 03 Jul 2023

Published Date: 07 Jul 2023

Citation:

Rhalimi L. Necrotizing Ulcerative
Gingivitis: A Case Report. *Ann Clin
Case Rep.* 2023; 8: 2438.

ISSN: 2474-1655.

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Case Presentation

A 21-year-old female patient was referred to the periodontics department at the University of Hassan II of Casablanca, Morocco. Her main chief of complaint was gingival pain in the lower incisor's region and also gingival bleeding during tooth brushing.

Clinical examination revealed evident halitosis, necrosis and ulceration of the interdental papilla's covered by a pseudomembrane. The papilla was absent in some sites and generalized accumulation of oral biofilm was observed on dental surfaces. Large calculus deposits were detected on the right upper posterior teeth. It was due to her unilateral chewing habits (Figure 1). During the physical examination, we reported the presence of lymphadenopathy even if no systemic condition that could predispose the patient to NUG was found. However, we reported a psychological stress probably due to her studies. X-rays examination showed no interproximal bone loss (Figure 2). Laboratory HIV test was done with the patient's consent and the result was negative. Based on the clinical data obtained at the examination, NUG was diagnosed. The treatment was taken urgently: Application of chlorhexidine gluconate 0.12% using sterile swabs, associated with ultrasonic supra-gingival debridement. An oral administration of antibiotic (500 mg of metronidazole 3 times a day during 7 days), chlorhexidine gluconate 0.12% + Chlorhydrate Cetylpyridinium Chloride mouth rinse (twice a day for 15 days) were performed. A motivational approach to changing the patient's oral hygiene habits was emphasized by the clinical team. Three days after, an ultrasonic sub-gingival debridement was performed to disorganize sub-gingival biofilm and to remove sub-



Figure 1: Clinical views at baseline showing necrosis and ulceration of the interdental papilla's covered by a pseudomembrane.



Figure 3: Three months after periodontal therapy.



Figure 2: Radiographic examination revealing no interproximal bone loss.

gingival calculus. With regular and effective maintenance of oral hygiene habits by the patient, the inflammatory clinical condition was reversed and periodontal health was observed within a few weeks (Figure 3).

Discussion

Necrotizing Ulcerative Gingivitis (NUG) involves only gingival tissue without periodontal attachment loss. This infectious disease is conditioned by several predisposing factors that compromise the host immune response [1]. Many factors can contribute to NUG, such as psychological stress, poor diet, insufficiency sleep, alcohol, tobacco, poor oral hygiene, pre-existing gingivitis, and HIV infection. These factors seem to affect the host immune response and enhance the bacterial pathogenesis. Psychological stress can be responsible of the reduction of gingival microcirculation and also the salivary flow. It increases also adrenocortical secretions and modifies the function of polymorphonuclear leukocytes and lymphocytes. Hence, it can alter the immune response [7,8], and increase the susceptibility to infections and bacterial proliferation [8]. In the present case, the patient was suffering from stress caused by her studies. This factor is an important parameter that predispose to NUG.

The diagnosis of NUG is made clinically according to the presence or the absence of 3 important clinical symptoms that are interproximal necrosis often described by «punched out» ulcerated papillae, gingival bleeding and gingival pain [1]. These clinical signs were all detected in the present case. Systemic signs as lymphadenopathy, fever and malaise have also been reported to occur in NUG [9]. In the present case, fetid breath and lymphadenopathy were also detected at clinical

examination.

Concerning the histological aspect, the observation of the gingival tissue with light microscopy shows the presence of an ulcer within the stratified squamous epithelium and the superficial layer of the gingival connective tissue, surrounded by a nonspecific acute inflammatory reaction. In a classic electron microscopic investigation, four zones associated with the gingival lesion of NUG were identified (1): A superficial bacterial area; (2) a neutrophil-rich zone; (3) a necrotic zone and (4) spirochetal infiltration zone. Additional findings included plasma cells in the deeper parts and IgG and complement factor C3 between epithelial cells. These observations have been confirmed by electron microscopy, adding areas of transition to a chronic stage of inflammation [10].

The microbiota composition associated with NUG includes *Treponema* sp., *P melaninogenicus* sp. Intermedius, *Fusobacterium* sp., *Selemonas* sp. and *A. odontolyticus*. The findings of Loesche in 1982 confirm that these microorganisms are contributors to the pathogenesis of this disease [11]. According to the last EFP/AAP workshop [10], other bacterial types were also described in the NUG microbiota. The authors reported a microbiota containing 4 bacterial species that are *P. intermedia*, *Treponema*, *Selenomonas* and *Fusobacterium*.

The diagnosis of NUG may be confused with primary herpetic gingivostomatitis, desquamative gingivitis, agranulocytosis, leukemia and ascorbic acid deficiency associated gingivitis [9].

The treatment of NUG should be approached in successive stages. This treatment includes the management of the acute phase, treatment of any pre-existing condition, treatment of abnormalities following the disease, and transition to supportive periodontal therapy phase. The first phase aims to control patient's discomfort and to stop tissue destruction. This involves ultrasonic debridement of superficial gingival plaques and calculus along with oxygen therapy [7]. The use of 0.12% Chlorhexidine Gluconate mouth rinse can be recommended twice a day for 15 to 30 days [3]. Patients with severe or moderate NUG and local lymphadenopathy or other systemic symptoms are placed on antibiotic regimen of Penicillin (500 mg every 6 h) [9] and 250 mg of Metronidazole every 8 h for 7 days). Metronidazole is the appropriate choice of drugs because it is active against anaerobic bacteria's [12]. Antibiotics should be continued until systemic complication subside [9].

Predisposing factors should be evaluated and also treated. Patient education is very important in order to maintain a good oral health. Oral hygiene instructions should be reinforced and patients should be placed into a maintenance program [9].

Conclusion

NUG is a specific acute periodontal disease. The diagnosis is based on the presence of typical clinical features that are papilla necrosis, gingival bleeding and gingival pain. A successful treatment should be organized on successive steps. Risk factors should also be taken into consideration in order to avoid the occurrence of this disease.

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