



MANAGEMENT OF NECROTIZING PERIODONTITIS IN THE SETTING OF STRESS: A CASE STUDY

Tengku Natasha Eleena Tengku Ahmad Noor^a, Wan Nur Alwani Wan Abdul Aziz^b

^a Dental Officer of 609 Armed Forces Dental Clinic, Semenggo Camp, Kuching, Sarawak, Malaysia

^b Periodontology Department, Faculty of Dentistry, Malaysia Islamic Science University, Negeri Sembilan, Malaysia

ARTICLE INFO

ARTICLE HISTORY

Received: 30-10-2021

Revised: 12-12-2021

Accepted: 21-02-2022

Published: 30-06-2022

KEYWORDS

NPD, stress

Military personnel

Antibiotics

ABSTRACT

This case study is reported a 36-year-old male military personnel came to Kuching Armed Forces Dental Clinic in feverish state complaining upon difficulty in eating due to pain and multiple ulcers on his gum for the past one week. After a thorough physical and history examination, a diagnosis of Necrotizing Periodontal Disease (NPD) is made. To confirm the cause of NPD, the patient has been referred to a medical counterpart for full blood count (FBC) and viral test. The choice of initial treatment is to do a basic full mouth scaling together with local anaesthesia. Patient was given oral hygiene instructions along with a prescription of systemic antibiotics and chlorhexidine mouthwash. Stress management course and leaflets has been part of the treatment. Review is done in 10 days. The Patient came back with no sign and symptom of NPD.

1.0 INTRODUCTION

Necrotizing Periodontal Disease (NPD) according to the 2017 American Academy of Periodontics classification system. It is a distinct and specific disease characterized by the presence of ulcers within the stratified squamous epithelium and the superficial layer of the gingival connective tissue, surrounded by a non-specific acute inflammatory infiltrate. The disease has been known by many synonyms such as trench mouth, Vincent's disease, ulceromembranous gingivitis and necrotizing gingivostomatitis (NOMA) [1]. Clinical findings of Necrotizing Periodontitis include a greyish white pseudomembrane over necrotic gingival areas, bleeding from exposed ulcerated tissue and severe halitosis. Patients will typically present with pain on eating or brushing teeth due to necrotic ulcers at the interdental papilla as well as general malaise and an elevated temperature [2].

Necrotizing Periodontal Diseases may occur in healthy patients with neglected oral hygiene, typically develop in patients with suppressed immune systems after viral infections, including HIV, severe malnutrition, stress, and smoking [1]. In developing countries NPD remains a common diagnosed lesion because of the existing poor nutritional status, stressful living conditions, poor oral hygiene and a state of debilitation often resulting from endemic contagious countries [3-4]. Emotional and psychological stress has been frequently being identified as a contributing factor to NPD, which is often seen among military recruits, deployed military personnel, college students during exam periods, depressed patients, and patients that feel overwhelmed by life situations [5-6]. According to Alleyne and Young, stress is believed to predispose to NPD by causing elevation in adrenocortical secretion and the release of substance P, a peptide hormone which suppresses both specific and nonspecific immunity [7]. Thus, affects patients' moods in oral hygiene and diet intake.

Although the prevalence rate of Necrotizing Periodontitis is not high, it should be emphasized that it can affect the most severe periodontal condition in which lead to soft-tissue destruction or alveolar bone loss within a short period of time [1, 8]. Therefore, proper initial diagnosis and immediate treatment are most important. This report presents a case of Necrotizing Periodontitis patient under a setting of stress

together with poor oral hygiene and a brief treatment protocol for acute pain management and symptomatic relief.

2.0 CASE PRESENTATION

A 36-year-old male military personnel came to Kuching Armed Forces Dental Clinic with complaint of pain and multiple ulcers on his gum for the past one week. Patient claimed that he feels feverish and has been on a liquid diet as he cannot chew with the sore gum he is having.

A clinical and radiographic examination was performed to rule out any preexisting pathology other than ulcerative gum. The patient is fit apart from having fever (38.9°C), has no underlying disease and was not under any medication. According to the patient's current military medical and dental report, he also has no medical history upon any systemic or infectious disease and very compliance with medical and dental treatments. Further inquiry into the patient's social history revealed no tobacco or alcohol use. Patient is married with three children and after a deeper investigation, the patient claimed that he does not practice unsafe sexual behaviours that could contribute to Human Immunodeficiency Virus (HIV) infection and is a pious man. However, he had not been able to sleep well during the past two weeks due to family problems that giving him a severe stress. An intraoral examination demonstrated generalized thick plaque, spontaneous bleeding and pain accompanied by a severe foul odour and ulcerated papilla with pseudomembrane on the upper palatal area between 11 and 21 and both sides of upper buccal posterior (Figure 1). A radiographic examination revealed multiple subgingival calculus with evidence of crestal bone loss on upper posterior teeth with multiple dental restoration (Figure 2).



Figure 1. Pre-treatment photograph showing ulcerative interdentary papilla on palatal anterior area and buccal posterior of left and right

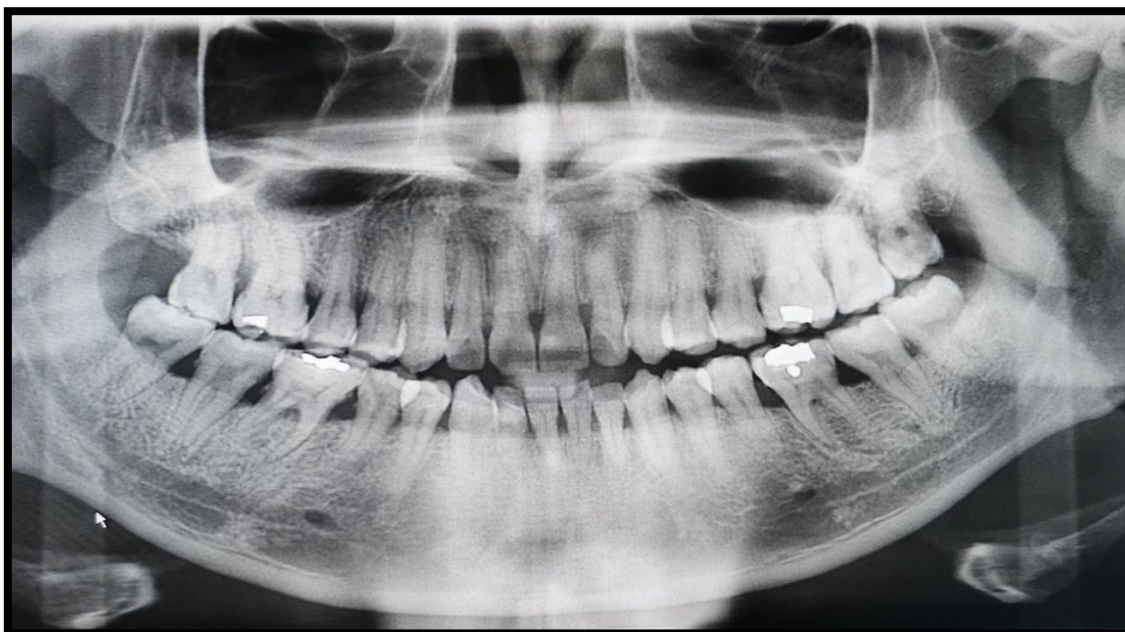


Figure 2. Pre-treatment radiograph showing multiple subgingival calculus with evidence of crestal bone loss on upper posterior teeth with multiple dental restoration

Subsequently, the patient was supragingival debrided with ultrasonic instruments under local anaesthesia and was given thorough oral hygiene instructions to improve the oral hygiene especially on the buccal side left and right posterior area. A 10-day course of amoxicillin 500 mg, metronidazole 500 mg and 0.12% chlorhexidine were prescribed for the patient. Patient has been referred for stress management counsel as part of the treatment. Patient was referred to medical for full blood count (FBC) with differential analysis to check for any possible relationship with systemic diseases or infections such as HIV. The results came out after 3 days and revealed an elevated neutrophil percentage (81.7%) and slightly reduced lymphocyte count (13.2%), which indicated an acute infection state. Result came out as negative for the HIV test. Based on the overall clinical and laboratory findings, the differential diagnosed of this patient is Necrotizing Periodontal Disease.

Follow-up appointment was given 10 days after the initial treatment. Patient claimed absence of pain, bleeding and ulcer on his gum as he can eat and brush his teeth as usual. Intra oral examination revealed an improved gingival appearance, and the ulceration of the papilla had entirely disappeared (Figure 3). To confirm the diagnosis of Necrotizing Periodontal Disease, we did Basic Periodontal Examination and Plaque Index after the pain has subsided and patient was more comfortable to give cooperation [9-10].

Table 1: Basic periodontal examination

4	1	3
4	1	3

Table 2. Plaque index by Löe and Silness [10]

Tooth	Index
Maxillary right first molar (16)	3.0
Maxillary right lateral incisor (12)	1.2
Maxillary left first bicuspid (24)	1.5
Mandibular left first molar (36)	3.0
Mandibular left lateral incisor (32)	2.0
Mandibular right first bicuspid (44)	3.0
Total	13.7
The index of the patient (total / 6)	2.2

Patient was cleaned again using ultrasonic instruments and this time it was done subgingival and root planning with local anaesthesia. Three months' follow-up appointment was scheduled, and the patient were being enforced on his stress management as well as his oral hygiene care. Patient has agreed to be

referred to the family counsellor under The Military Religious Corps in order to help him managing his stress.



Figure 3. 10 days' follow-up treatment showing healing of gingiva



Figure 4. 3 months follow-up treatment

3.0 DISCUSSION

This clinical report described the management of Necrotizing Periodontitis in the setting of stress with compromised oral hygiene. Initial management focused on treatment of the acute gingival inflammation to eliminate the pain. Treatments include supragingival scaling under local anaesthesia and prescribed with amoxicillin and metronidazole for 10 days. This antibiotic combination along with ultrasonic scaling has been shown to improve the outcome of NPD compared to without prescribing the antibiotics [11]. Microbes are believed to be the primary cause of NPD; *Treponema* spp. and *P. intermedia* [5, 12]. Spirochetes, fusiform microbes found in necrotic lesions, have an ability to destruct periodontal tissue through activation or modification of host immune response by invading the epithelium and connective tissue and releasing endotoxins.

The diagnosis of Necrotizing Periodontitis is based on clinical findings where lesion usually initiate at the interdental papilla and demonstrate a typical “punched-out” appearance with inverted papilla [1, 5, 13]. According to Kwon et al (2016), the starting point is often at the interdental papillary tip and col area due to aseptic necrosis of the gingival epithelium when there is insufficient of blood supply [13]. Its explained the ulcers are covered by a greyish-green pseudomembrane and are surrounded by an erythematous margin. Gingival bleeding and severe pain together with halitosis are often encountered. The present case demonstrated not only necrosis, ulceration with pseudomembrane, spontaneous bleeding and severe pain at the interdental papilla especially on upper anterior palatal and posterior buccal area, but also fever and halitosis. The highest BPE score of 4 at the two posterior sextants together with poor plaque control and presence of gum recession indicated that the patient had a preexisting periodontitis that had bring to the diagnosis of Necrotizing Periodontitis rather than Necrotizing Gingivitis.

Plaque Index (PI) score was taken after 10 days’ post treatment to see if there is any involvement of poor oral hygiene on this case. It is done after the treatment and pain subsides as the patient comes with acute pain. Plaque Index score shows patient has abundance of plaque and soft deposit within the gingival pocket and/or on the tooth and gingival margin. Plaque accumulation has been considered a predisposing factor for Necrotizing Periodontal Disease, which may also aggravate by limited tooth brushing because of pain [14]. NPD usually occurred secondarily to previously existing periodontal disease such as chronic gingivitis and previous NPD. Very clearly, stress along with other psychological factors have been implicated as a risk factor of Necrotizing Periodontal Disease. Since 1976, De Marco (1976) has used the term “periodontal emotional stress syndrome” to describe the impact of the stress suffered by the soldiers involved in the Vietnam War on the progression of periodontal disease [15]. Stress is a specific human reaction in response to a trigger, and is characterized by three successive phases: alarm, resistance, and general coping syndrome [16]. Stress can be distinct into two types which is acute and chronic stress. Acute stress is the sudden and temporary response of the human body to as stressor which has a definite beginning and end while chronic stress is the response to intermittent and repeated exposure to a stressor over a continuous period [17].

Several pathways have been proposed to explain the stress-periodontal disease association. According to Stabholz *et al.*, (2010), mechanism have been grouped into 2 broad categories: 1) ‘health-impairing behaviours’ associated with stress, such as increase in tobacco and alcohol consumption, poor oral hygiene and poor nutritional intake, 2) ‘pathophysiological factors’ that lead to increase in stress hormones which can indirectly influence inflammatory and immunological profiles and increase the susceptibility to periodontal disease [18]. Stress is responsible for modifying the host response by causing a considerable elevation in the epinephrine and non-epinephrine levels which causes a significant decline in the flow of saliva and impaired gingival blood flow [19]. Opportunistic bacteria such as *Prevotella intermedia* and other spirochetes are expedited by the impaired conditions thus leading to NPD.

Necrotizing Periodontitis can be managed easily with adequate diagnosis and treatment planing, or it can lead to severe tissue destructing and attachment loss. The first phase is acute treatment which is to prevent progression of tissue loss by infection and to provide relief of pain [13]. The second treatment phase is the melioration of pre-existing conditions where symptoms would be improved after the initial acute phase. This included scaling and root planing, intense oral hygiene instruction and control of systemic factors such as smoking, diet and stress. Gingivectomy or periodontal flap surgery as the treatment of disease sequelae comes in third phase only be considered only if deemed necessary after

proper oral hygiene establishment. The fourth and final treatment phase proceeds by supportive periodontal therapy to maintain oral hygiene and control of systemic factors [1, 13, 20]. The patient discussed in this report went through first and second phase treatment where we managed to treat the acute phase and the patient is compliant with the treatment. The fourth state of controlling patient's systemic factor which is stress has been consulted to the therapist and patient is under review for every three months as part of maintaining the oral condition. In this case as discussed in this report, a proper diagnosis was followed by improvement of the patient's condition.

4.0 CONCLUSION

In conclusion, we report a case of Necrotizing Periodontitis caused by stress of a military personnel. NPD is a rare disease but not uncommon for patients with poor oral hygiene, suppressed immune system, stress, malnutrition and smoking. However, it can be managed well with a proper diagnosis and management.

5.0 ACKNOWLEDGEMENT

Dental Service of Malaysian Armed Forces, Ethical Board of Tuanku Mizan Armed Forces Hospital and Faculty of Dentistry, Malaysia Islamic Science University

List of References

- [1] Herrera, D., Alonso, B., de Arriba, L., Santa Cruz, I., Serrano, C., & Sanz, M. (2014). Acute periodontal lesions. *Periodontology 2000*, 65(1), 149-177.
- [2] Loeb, M. M. A., Buchanan, W., & Bain, J. (2017). Necrotizing ulcerative gingivitis in the setting of vitamin B12 deficiency: a case report. *Oral Health and Dental Management*, 1-6.
- [3] Papapanou, P. N., Sanz, M., Buduneli, N., Dietrich, T., Feres, M., Fine, D. H., ... & Tonetti, M. S. (2018). Periodontitis: Consensus report of workgroup 2 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. *Journal of periodontology*, 89, S173-S182.
- [4] Folayan, M. O. (2004). The epidemiology, etiology, and pathophysiology of acute necrotizing ulcerative gingivitis associated with malnutrition. *J Contemp Dent Pract*, 5(3), 28-41.
- [5] Johnson, B. D., & Engel, D. (1986). Acute necrotizing ulcerative gingivitis: a review of diagnosis, etiology and treatment. *Journal of Periodontology*, 57(3), 141-150.
- [6] Malek, R., Gharibi, A., Khilil, N., & Kissa, J. (2017). Necrotizing ulcerative gingivitis. *Contemporary clinical dentistry*, 8(3), 496-500.
- [7] Alleyne, G. A., & Young, V. H. (1967). Adrenocortical function in children with severe protein-calorie malnutrition.
- [8] Albandar, J. M. (2014). Aggressive and acute periodontal diseases. *Periodontology 2000*, 65(1), 7-12.
- [9] Tugnait, A., Clerehugh, V., & Hirschmann, P. N. (2004). Use of the basic periodontal examination and radiographs in the assessment of periodontal diseases in general dental practice. *Journal of dentistry*, 32(1), 17-25.
- [10] Loe, H., & Silness, J. (1963). Periodontal disease in pregnancy I. Prevalence and severity. *Acta odontologica scandinavica*, 21(6), 533-551.
- [11] Matarazzo, F., Figueiredo, L. C., Cruz, S. E. B., Faveri, M., & Feres, M. (2008). Clinical and microbiological benefits of systemic metronidazole and amoxicillin in the treatment of smokers with chronic periodontitis: a randomized placebo-controlled study. *Journal of clinical periodontology*, 35(10), 885-896.
- [12] Guerrero, A., Griffiths, G. S., Nibali, L., Suvan, J., Moles, D. R., Laurell, L., & Tonetti, M. S. (2005). Adjunctive benefits of systemic amoxicillin and metronidazole in non-surgical treatment of generalized aggressive periodontitis: a randomized placebo-controlled clinical trial. *Journal of clinical periodontology*, 32(10), 1096-1107.
- [13] Kwon, E. Y., Choi, Y. K., Choi, J., Lee, J. Y., & Joo, J. Y. (2016). Effective Management of Acute Necrotizing Ulcerative Gingivitis with Proper Diagnosis and Immediate Treatment. *Journal of Korean Dental Science*, 9(2), 81-89.
- [14] Horning, G. M., & Cohen, M. E. (1995). Necrotizing ulcerative gingivitis, periodontitis, and stomatitis: clinical staging and predisposing factors. *Journal of Periodontology*, 66(11), 990-998.
- [15] De Marco, T. J. (1976). Periodontal emotional stress syndrome. *Journal of Periodontology*, 47(2), 67-68.

- [16] Selye, H. (1973). The Evolution of the Stress Concept: The originator of the concept traces its development from the discovery in 1936 of the alarm reaction to modern therapeutic applications of syntoxic and catatoxic hormones. *American scientist*, 61(6), 692-699.
- [17] Gunepin, M., Derache, F., Trousselard, M., Salsou, B., & Risso, J. J. (2018). Impact of chronic stress on periodontal health. *Journal of Oral Medicine and Oral Surgery*, 24(1), 44-50.
- [18] Stabholz, A., Soskolne, W. A., & Shapira, L. (2010). Genetic and environmental risk factors for chronic periodontitis and aggressive periodontitis. *Periodontology 2000*, 53(1).
- [19] Cogen, R. B., Stevens Jr, A. W., Cohen-Cole, S., Kirk, K., & Freeman, A. (1983). Leukocyte function in the etiology of acute necrotizing ulcerative gingivitis. *Journal of Periodontology*, 54(7), 402-407.
- [20] Noor, T. N. E. T. A., Dass, A., & Abdullah, L. M. (2021). FOREIGN BODY ON RIGHT LATERAL BORDER OF TONGUE THAT MIMICKS VARIX: A CASE REPORT. *Zulfaqar Journal of Defence Science, Engineering & Technology*, 4(2).