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CASE REPORT

Clinical diagnosis and treatment of necrotizing ulcerative gingivitis in the orthodontic patient. A case report.

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Abstract: Introduction: About 0.1% of the population suffers from necrotizing ulcerative gingivitis, a disease of rapid progression and acute manifestation, which may progress to necrotizing ulcerative periodontitis and eventually to bone sequestration and loss of gingival tissue. Case report: A 21-year-old female patient undergoing orthodontic treatment for six months, diagnosed with necrotizing ulcerative gingivitis due to acute pain in the gingival tissue, spontaneous bleeding, halitosis and abundant plaque. The treatment was conservative and effective, obtaining total remission of the lesion after seven days and three months of postoperative follow-up. Conclusion: Today there are no epidemiological or clinical reports that support the relationship of necrotizing ulcerative gingivitis and orthodontic treatment. Prevention is critical to the success of the treatment, which is why the dentist should recognize the clinical features of necrotizing ulcerative gingivitis to raise awareness of its risks in the orthodontic patient.

Keywords: *Gingivitis, Necrotizing ulcerative gingivitis, Hydrogen peroxide, Orthodontics.*

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INTRODUCTION.

Necrotizing ulcerative gingivitis (NUG) is one of the necrotizing periodontal diseases found in 7% of some populations such as military personnel, approaching a prevalence of 0.1% of the world population[1].

Necrotizing periodontal diseases have a rapid and acute onset, in need of urgent treatment, and although they share similar characteristics they differ in extent[2]. Clinical manifestations of NUG include necrosis of the interdental papilla, adopting an inverted and whitish form, spontaneous gingival bleeding or from mild stimulation, acute pain and fetid odor[3], in addition to non-pathognomonic systemic signs of the disease as regional lymphadenopathy, fever and malaise[4].

Today it is known that NUG is caused by a bacterial infection often associated to species such as *Treponema* spp.[5], *Selenomonas* spp., *Fusobacterium* spp. and *Prevotella intermedia*[6]. However, this may depend on the systemic condition of the patient; in patients with HIV, species such as *Candida* spp. and Herpes virus[7,8] can be found.

Among the risk factors that predispose to the development of NUG are psychological stress, malnutrition, immunosuppression, cancer[9], HIV[10], and other factors that may favor its development such as smoking tobacco, previous gingivitis[4], and other causes that favor the retention of plaque, such as the use of orthodontic appliances, one of the causes of NUG poorly reported today[4].

The aim of this paper is to report a case of a 21-year-old female patient, diagnosed with necrotizing ulcerative gingivitis associated with stress and orthodontic treatment, treated without systemic administration of antibiotics.

CASE REPORT.

Twenty-one-year-old female patient, treated at Posgrado de Periodoncia e Implantología at Universidad Autónoma de Nuevo León, later referred to the Posgrado de Ortodoncia due to "gingival bleeding".

In the examination of her medical records the patient reported suffering from hypothyroidism, diagnosed 13 years ago. The condition was under control. The patient had been taking levothyroxine 100mg every 24 hours for the past 10 years, with check-ups every 6 months. The patient had no history of tobacco smoking or alcohol consumption, so she was classified as ASA II[11].

In her dental history the patient had fixed orthodontic appliances for 6 months, with extractions of teeth 1.4 and 2.4, and the presence of some resin fillings in the posterior segment of both arches.

The patient referred a widespread acute pain in the gingival tissue that had started two weeks before, so she had not been able to perform her oral hygiene adequately and had stopped brushing her teeth for the last three days. She also mentioned that she was going through a period of academic stress for the past three weeks.

Clinical intraoral examination showed gingival inflammation and ulceration with he presence of a greyish pseudomembrane at the level of the papillary and marginal gingiva, the contour of the papillae was shaped like a slough (inverted), plaque buildup at cervical third and on the facial/lingual tooth surfaces, spontaneous gingival bleeding in the lower and upper incisors, and the presence of a fetid odor at mouth opening (Figure 1 and 2).

Extraoral physical examination showed no regional lymphadenopathy or signs of fever. Patterns of bone loss were not observed on intraoral radiographs. Conversely, the level of crestal bone was found at the amelo-cementum junction (Figure 3), which should have been confirmed by clinical examination. However, as the patient had acute symptoms of NUG, clinical examination was not carried out.

Considering symptoms and clinical signs, the condition was diagnosed as necrotizing ulcerative gingivitis. Bacterial plaque was identified as the primary etiological causative agent, stress and fixed orthodontic appliances as the secondary agents. Overall prognosis was considered good[12].

In the patient's first visit to the dental practice, for examination and diagnosis, a supragingival scaling was performed using ultrasonic instruments and hydrogen peroxide irrigation, with the aim of removing the primary etiologic factor, trying not to touch the gingiva because of the presence of acute pain.

Figure 1. Initial frontal photographs.

Figure 2. Initial occlusal photographs.

Figure 3. Series of initial periapical radiographs.

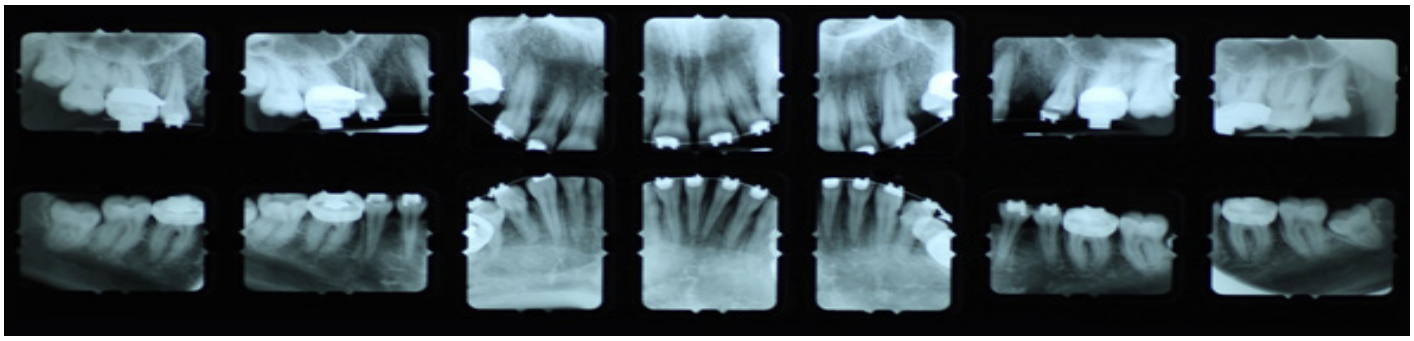
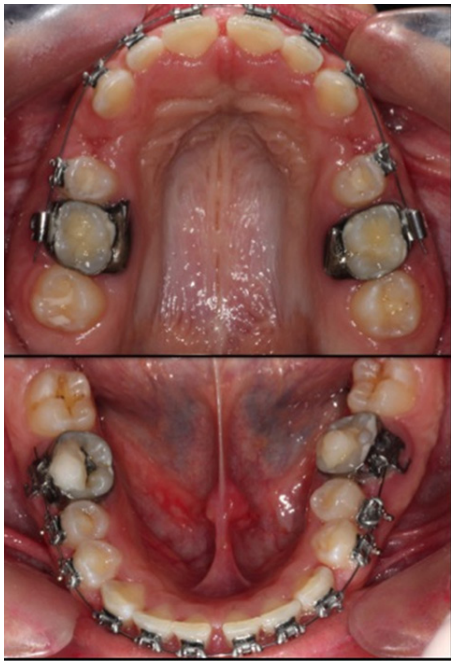


Figure 4. Frontal photographs after seven days, showing gingival tissue stability and absence of ulcerative lesions.

Figure 5. Occlusal photographs after seven days.



The patient was instructed and encouraged to perform Bass brushing technique and Charters' technique, in addition to interdental cleaning with dental floss and an interdental toothbrush, as well as the use of a mouthwash with 20ml of hydrogen peroxide (ratio of 2:1, H_2O: H_2O_2) for one minute, three times a day for one week.

After seven days, the patient reported a remarkable improvement in her hygiene technique and absence of pain and halitosis. Intraoral examination revealed stable gingival tissue with no inflammation and a pale pink color in the keratinized gingiva. In addition, papillae showed normal physiological traits and were less friable, showing an apparent decrease in plaque (Figure 4 and 5). During the examination a probing was performed, revealing a physiological sulcus of 2 to 3mm. Only brushing technique was reinforced. Check-ups for plaque control were scheduled every three months.

After three months the patient came back to the practice for a check-up. A healthy, stable and non-inflamed gingival tissue was found (only an accumulation of tissue in the papilla of upper central incisors, without the presence of gingivitis, caused by the closure of diastema, was observed). Scaling and plaque control were performed.

DISCUSSION.

One of the goals of orthodontic treatment is to contribute to better oral hygiene, correcting dental irregularities and eliminating dental trauma[13]. However, during its course gingival hypertrophy, accumulation of plaque and calculus formation can occur[14], increasing the levels of periodontopathogenic

bacteria and compromising periodontal health[15]. Even with excellent oral hygiene patients usually experience mild to moderate gingivitis in the first or second month after the placement of the orthodontic appliance, especially in adolescent patients, because hormonal changes may predispose them to gingivitis, in addition to the presence of the orthodontic apparatus[16].

Oral health is primarily based on plaque control, which is why dentists must emphasize the importance of periodontal health to the orthodontic patient and the benefits of using a good brushing technique. Nassar *et al*. have evaluated the effect of horizontal brushing techniques, modified Stillmans technique and Bass technique in patients with orthodontic appliances, which over a period of nine months showed improvements in plaque and gingival indexes. The Bass technique showed a significant reduction in gingival index[17]. In this case the patient had altered passive eruption, an oral condition in which patients have shorter clinical crowns, which could reduce the distance between the gingival margin and the orthodontic appliance, making it difficult to perform oral hygiene techniques, situation that was confirmed by the patient[18].

Even today NUG prevalence in orthodontic patients is unknown. However, Sangani *et al.* have reported a number of cases where they suggest that antibiotics should be used if there is pain and halitosis, in conjunction with other systemic signs, such as lymphadenitis and malaise. However, they consider that local debridement and the use of mouthwashes are sufficient when the patient shows mild clinical signs[19] .

To our knowledge, there are not enough reports about the relationship between orthodontic treatment and NUG. Lira *et al.* have reported the therapeutic success of using 500mg of metronidazole and chlorhexidine 0.12% mouthwashes in a patient with NUG and under orthodontic treatment[4]. In this case, despite the existence of acute symptoms, a positive result was achieved by the exclusive administration of hydrogen peroxide. Good responses have been reported with the use of hydrogen peroxide in necrotizing stomatitis[2]. It has been demonstrated that its repetitive application in conjunction with professional debridement can result in suppression of *Aggregatibacter actinomycetemcomitans*[20].

In conclusion, this is the case report of a patient under orthodontic treatment with a diagnosis of necrotizing ulcerative gingivitis. The patient received supragingival debridement and mouthwashes with hydrogen peroxide without administration of antibiotic therapy. The NUG had a resolution after 7 days of therapy and showed good stability over the following three months with oral hygiene instruction, which is crucial for the treatment. It is important that the dentist and orthodontist know the clinical manifestations of necrotizing ulcerative gingivitis for early diagnosis and prevention, as well as its possible treatments when making decisions in order to avoid overtreatment and the complications associated with this condition.

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Diagnóstico clínico y tratamiento de la gingivitis ulcerativa necrotizante en el paciente ortodóntico. Reporte de un caso.

Resumen: Introducción: Alrededor del 0.1% de la población padece de gingivitis ulcerativa necrotizante, una enfermedad de progresión rápida y de presentación aguda que puede progresar a periodontitis ulcerativa necrotizante llegando a desarrollarse secuestros óseos y la pérdida de tejido gingival. Reporte del caso: Paciente femenino de 21 años de edad bajo seis meses de tratamiento ortodóntico, quien fue diagnosticada con gingivitis ulcerativa necrosante, debido a dolor agudo en el tejido gingival, sangrado espontáneo, halitosis y abundante placa bacteriana. El tratamiento fue llevado a cabo de manera conservadora y efectiva, obteniendo la remisión total de la lesión al término de siete días y los tres meses de seguimiento postoperatorio. Conclusión: Hoy en día no existen reportes epidemiológicos ni clínicos que sustenten la relación de la gingivitis ulcerativa necrotizante y el tratamiento ortodóntico. La prevención es decisiva para el éxito del tratamiento, es por ello que el odontólogo debe conocer las características clínicas de la gingivitis ulcerativa necrotizante para hacer conciencia en el paciente ortodóntico.

Palabras clave: *Gingivitis, Gingivitis ulcerosa necrotizante, Peróxido de hidrógeno, Ortodoncia.*

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