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Management of Traumatic Ulcers in a Patient with Angle Class I Malocclusion: A Case Review

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Abstract: Malocclusion is an inappropriate relationship of opposing teeth when the jaws are in contact. This malocclusion condition can cause oral cavity problems, one of which is traumatic ulcers. Traumatic ulcers are one of the most common lesions on the oral mucosa, where there is a loss of the epithelial layer beyond the basement membrane and affects the lamina propria which is generally caused by trauma. Traumatic ulcers can occur on the oral mucosa, including: on the tongue, lips, buccal mucosa folds, gingiva, palate, labial mucosa, buccal mucosa and floor of the mouth. The clinical picture of traumatic ulcers is not specific depending on the etiology, has a smooth surface, a yellowish lesion base and red margins and no induration. Ulcers usually heal without leaving a trace in 10-14 days, spontaneously or after eliminating the cause. Traumatic ulcers can occur at any age, both in men and women. The prevalence of traumatic ulcers is quite high. Several studies show variations in the range of 3 - 24% of the population. Management of traumatic ulcers is in the form of correcting predisposing factors. Local symptomatic treatment is the standard treatment for simple traumatic ulcers. Therapy in this case is to provide Oral Hygiene Instructions on the importance of maintaining dental and oral health. In addition, the patient was prescribed topical hyaluronic acid (Aloclair gel 8 ml) to reduce pain, povidone iodine antiseptic mouthwash and vitamin B12 to accelerate healing and the patient was asked to check 1 week after treatment. Summary of the results of traumatic ulcer therapy due to class I malocclusion with topical hyaluronic acid Aloclair gel 8 ml, antiseptic povidone iodine mouthwash, and vitamin B12 showed significant improvement in symptoms. Aloclair gel helps reduce pain and accelerate healing, while antiseptic mouthwash helps prevent infection. Vitamin B12 plays a role in accelerating the wound healing process.

Keywords: Malocclusion; Oral hygiene index; Oral mucosa; Traumatic Ulcus

Introduction

Malocclusion is an inappropriate relationship of opposing teeth when the jaws are in contact (Dorland, 2011). Malocclusion can also be defined as abnormal contact between the upper and lower jaw teeth (Mosby, 2016). Malocclusion can be classified into three classes which depends on the mesiobuccal cusp of upper first molar position on the buccal groove of the lower first molar. Angle's class I malocclusion, which is also known as netroclusion, is when the upper first molar mesiobuccal cusp occludes with lower first molar buccal

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groove (Anura, 2014). Eventhough this malocclusion represents molars regular relationship, the occlusal plane is usually not correct or deviated because of factors such as malposed teeth, rotations, and so on.4 This malocclusion is then further classified by Dewey. Malocclusion class 1 type 1 is an Angle's class I malocclusion accompanied by crowded incisors and/or labially positioned canines (Anura, 2014).

The most common soft tissue disease is traumatic ulcers. In Indonesia, the prevalence of traumatic ulcers reaches 93.3% (Sa'adah, 2021). The occurrence of traumatic ulcers is caused by the removal of epithelial tissue on the mucosal surface, resulting in wounds and the formation of ulcers with a surface covered by pseudomembrane with erythematous edges (Laskaris, 2017).

Traumatic ulcer is a type of ulcer lesion, namely an abnormality that occurs in the mucosa in the oral cavity caused by trauma. It is an apathetic condition which is characterized by the loss of epithelial tissue due to the peeling of necrotic and inflammatory tissue that spreads within the lamina propria (Greenberg et al., 2008; Mitchell et al., 2007). The etiology of traumatic ulcer is the existence of mechanical trauma such as ill-fitting dentures, biting of the mucosa, or habitual biting, chemical trauma, thermal trauma, electrical trauma as well as teeth fracture, malposition, or malformation (Herawati et al., 2019; Suhartiningtyas et al., 2020). This ulcer can be found on tongues, lips, buccal fold, gingiva, palatal, labial mucosa, buccal mucosa, and the floor of the mouth (Akbari et al., 2014). However, this ulcer are most commonly found on labial and buccal mucosa because of its nearby location to the teeth occlusion hence it is easier to be traumatically bitten during mastication. Mucosa or soft tissue is tissue that has a flexible texture that functions as a binder and support for teeth, as well as protecting the oral cavity from diseases caused by microorganisms, trauma or other factors (Goktas et al., 2011).

The clinical picture of traumatic ulcers is non-specific depending on the etiology, has a smooth surface, a yellowish base and red margins and no induration. Traumatic ulcers heal a few days after eliminating the cause. If it persists for more than 7-10 days, or there are other reasons for suspicion of the cause, a biopsy should be performed (Langlais et al., 2009).

Traumatic ulcers can occur at any age, both in men and women. The prevalence of traumatic ulcers is quite high. Several studies show variations in the range of 3-24% of the population (Manoppo, 2013).

Clinical appearance of traumatic ulcer are smooth surface, center of the ulcer is usually yellow-gray or white/gray in color with erythematous border, no induration, and no specific shape which depends on the etiology (Wijayanthy et al., 2022). Local symptomatic treatment is the standard of care for simple traumatic ulcers. Examples include topical hyaluronic acid to reduce pain, povidone iodine mouthwash to reduce ulcer duration, vitamin B12 to speed healing (Apriasari, 2012; Langlais et al., 2009). We must pay attention to previous history so that the diagnosis of traumatic ulcers can be more precise and treatment more appropriate to reduce pain and duration of ulcers and prevent recurrence.

Method

Article review methods include summarization, grouping, in-depth analysis, and comparison. This method is carried out by relying on previously published data or literature.

Result and Discussion

Case Report

A 20-year-old female patient came with a complaint of canker sores on the left inner lower lip since 2 days ago because she bit it while eating. The canker sores were painful and sore especially when eating and talking. The patient did not have any bad habits and had no history of allergies. The patient had not received any treatment for the canker sores and wanted to be treated so that they would not hurt anymore. Based on clinical examination, one ulcerated lesion was found on the left lower labial mucosa, white in color, surrounded by erythematous or reddish tissue, irregular in shape, 3 mm in diameter, shallow. From the anamnesis and clinical examination, it can be concluded that the diagnosis of this patient's disease is a traumatic ulcer on the left inferior labial mucosa.

From the results of anamnesis and examination, traumatic ulcer in this patient is a mechanical trauma that occurs in the lower left labial mucosa, the wound is caused by being bitten while eating. The clinical picture shows one ulcerated lesion on the left inferior labial mucosa, yellowish white in color, irregular edges surrounded by erythema/redness, shallow concave base, no induration, and soft when palpated (Figure 1).

Therapy in this case is by providing Oral Hygiene Instructions on the importance of maintaining dental and oral health. In addition, the patient was prescribed topical hyaluronic acid (Aloclair gel 8 ml) to reduce pain, povidone iodine antiseptic mouthwash and vitamin B12 to accelerate healing and the patient was asked to check 1 week after treatment. Local symptomatic treatment is the standard of care for simple traumatic ulcers. Examples include topical hyaluronic acid to reduce pain, povidone iodine mouthwash to reduce ulcer duration, vitamin B12 to speed healing.

Figure 1. Traumatic ulcer before treatment

At the 1-week control, the traumatic ulcer had healed, was not painful, and there was an area of erythema on the left labial mucosa. The patient admitted to using povidone iodine 2x a day after brushing his teeth, in the morning after eating and at night. In addition, the patient was given OHI again so that he could maintain and care for his oral cavity health better. At the 1-month control, the traumatic ulcer had healed and left no scars, the patient also said that he no longer felt pain in the area. Then, the patient was given OHI again to maintain the cleanliness of his oral cavity. The clinical picture after 1 week of therapy, the patient did not feel pain and the results of the intra-oral examination showed that there were no abnormalities as shown in Figure 2.

Figure 2. Traumatic ulcer control 1 week after treatment, has healed although the red area still appears

Discussion

An ulcer is a defect in the epithelium in the form of a shallow lesion with clear boundaries, where the epidermis layer above it disappears. Ulcers can occur in various locations of the body, including the oral cavity. Traumatic ulcer is specifically defined as an ulcer caused by the loss of the epithelial layer beyond the basement membrane, affecting the lamina propria due to trauma.

Traumatic ulcers can be caused by various factors, which are generally categorized into mechanical, chemical, thermal, and electrical trauma. Mechanical trauma includes rough or sharp food, accidental biting, the use of toothbrushes, removable dentures, and sharp restoration edges. Chemical trauma can occur due to exposure to substances such as aspirin, silver nitrate, hydrogen peroxide (H_2O_2), and phenol. Thermal trauma can result from consuming excessively hot food or drinks, as well as exposure to cold carbon dioxide (dry ice). Electrical trauma, although less common, can occur due to electric shocks (Akintoye et al., 2014; Jinbu et al., 2014).

One of the causes of traumatic ulcers is mechanical trauma such as being bitten while eating. This can be caused by malocclusion of the teeth, so this can trigger trauma when chewing. Women experience more malocclusion than men, this is because there is a difference in facial bone growth where women experience faster facial bone growth than men, causing an imbalance in the development of the face and teeth (Yolanda, 2017). Bones in women tend to be smaller and narrower so that women's faces look smaller than men, this also causes women to experience more malocclusion (Dayataka et al., 2019).

In this particular case, the traumatic ulcer is caused by accidental biting, exacerbated by the predisposing factor of Angle's Class I Type 1 malocclusion. Traumatic ulcers typically present with discomfort, which appears 24-48 hours after trauma to the soft tissue in the oral cavity. Clinically, traumatic ulcers are characterized by an ovoid shape, a yellowish-white base, and an irregular erythematous border. These ulcers usually heal spontaneously without leaving scars within 10-14 days, provided that the causative factor is eliminated.

Ulcers usually heal without a trace in 7-14 days, spontaneously or after removing the cause. The ulcerated area will appear erythematous and tender and then ulceration will form a few hours after the trauma, it takes several days for the ulceration to heal depending on the extent of the ulcer (Houston, 2014; Minhas et al., 2019).

Excessive overjet in Angle Class I Type I malocclusion can cause the upper front teeth or lips to touch the gums or cheeks when speaking or chewing. This repeated impact or friction can cause irritation to the soft tissues and lead to the formation of traumatic ulcers. Excessive overbite can also cause the lower front teeth to press on the palate or gums, which can also cause trauma and traumatic ulcers.

Management of traumatic ulcers involves identifying and eliminating the causative factor. Additionally, antiseptic mouthwashes such as 1% povidone-iodine or protective agents such as orabase can be used to facilitate the healing process. It is essential

to monitor the healing progress of all traumatic ulcers. If the lesion persists beyond 10-14 days despite removing the causative factor, a biopsy should be performed to rule out the presence of malignancy, such as oral squamous cell carcinoma (Kvam et al., 1989; Thompson, 2011; Valente et al., 2016).

The pain felt by the sufferer is influenced by the depth and location of the ulcer in the oral cavity, but the lesion will heal on its own in 7-10 days without leaving scar tissue after the causative factor is removed (Baroni et al., 2006; Grevelink, 1989).

The treatment of ulcerative lesions varies depending on the size, duration, and location of the lesion. Ulcers resulting from mechanical or thermal trauma usually heal within 10-14 days upon the elimination of the traumatic agent. However, persistent ulcers require further investigation to exclude pathological conditions. Factors such as poor oral hygiene, systemic diseases like diabetes mellitus, or habits such as smoking and alcohol consumption can delay the healing process (Valente et al., 2016).

To prevent traumatic ulcers, it is essential to maintain good oral hygiene and avoid habits that may cause trauma to the oral mucosa. Proper brushing techniques, regular dental check-ups, and addressing malocclusion issues can help minimize the occurrence of traumatic ulcers. Patients wearing dentures should ensure they fit properly and are regularly assessed by a dentist to prevent irritation.

Furthermore, patient education plays a crucial role in the management and prevention of traumatic ulcers. Patients should be informed about the importance of identifying potential sources of trauma in the oral cavity, recognizing early symptoms of ulcer formation, and seeking prompt treatment when necessary (Mortazavi et al., 2016; Thompson, 2011).

Excess

This journal comprehensively explains the etiological factors of traumatic ulcers, their clinical presentation, appropriate management strategies, and the importance of patient education in maintaining oral health, especially concerning Class I Angle Type 1 malocclusion. By addressing these aspects, the journal provides valuable insights into the prevention and management of traumatic ulcers in clinical practice.

Lack

The diagnosis of traumatic ulcers in the journal is primarily based on history-taking and physical examination. However, a more thorough assessment should also include an evaluation of the patient's dental arrangement, particularly in cases involving Angle Class I Type 1 malocclusion, which serves as a predisposing factor for traumatic ulcers. The journal could benefit from a more detailed discussion on diagnostic techniques and further clinical considerations in the management of traumatic ulcers. Additionally, it would be beneficial to explore the role of systemic conditions and lifestyle factors in the healing process, as these can significantly impact ulcer resolution.

Conclusion

Traumatic ulcer is one of the lesions on the oral mucosa that often occurs. The etiology of traumatic ulcer is the presence of mechanical trauma, such as chemical, electrical or temperature, in addition it can also occur due to fractures, malposition or malformation of teeth. Management of patients with traumatic ulcers requires attention to the overall condition of the oral cavity. The treatment given to this patient is supportive therapy by providing OHI (Oral Hygien Instruciton) on how to maintain dental and oral health, topical hyaluronic acid application, consumption of vitamin B12, accompanied by control of predisposing factors, one of which is malocclusion, with orthodontic treatment to prevent recurrence.

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