



Case Report

Traumatic Ulcers in a Patient Using Fixed Orthodontic Appliances with Moderate Oral Hygiene

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Abstract

Traumatic ulcer is one of the most common ulcerated lesions brought on by local factors. It is usually a single ulcer, but multiple ulcers can also be found in some cases. Local factors that can result in traumatic ulcers include mechanical, thermal, and chemical factors. The most frequent mechanical causes of traumatic ulcers include utilizing orthodontic appliances, which can result in mechanical trauma. This case report, therefore, aims to provide information about the oral management of mechanical traumatic ulcers in a patient using fixed orthodontic appliances with moderate oral hygiene. A 22-year-old woman with moderate oral hygiene came to Oral Medicine Department RSGM Nala Husada with complaints of multiple sores on her lower lip, which was painful. Multiple ulcers ($\pm 10-15$ mm), erythematous margin, and concave yellow base were visible on intra-oral examination. On the lower teeth around the lesions, there were fixed orthodontic appliances (only braces, no wire and power O/chain). As a pharmacological therapy, a triamcinolone acetonide was administered in addition to BecomC and antiseptic mouthwash. As a non-pharmacological therapy, patients have been educated about the importance of scaling and root planning and routine control of orthodontic appliances to eliminate local factors causing ulcers and improve oral hygiene. One week after removing the causative factor, the ulcer healed completely without scars or pain.

Keywords: mechanical factor; oral lesion management; traumatic ulcers

INTRODUCTION

Oral diseases brought on disorders of pain, swallowing, eating, tasting, smiling, and communication functions.¹ During the intra-oral examination, a dentist must detect lesions on the oral mucosa. An oral soft tissue lesion is known as an abnormal change in color, surface, or loss of integrity of the oral mucosal surface.² A lesion is a pathological abnormality of tissue that causes symptoms. Primary and secondary oral soft tissue lesions come in two different varieties. Primary lesions include macules, papules, vesicles, bullae, plaques, nodules, pustules, keratoses, and wheals.³ Meanwhile, erosion, ulceration,

fissure, cicatricial, desquamation, pseudo-membranes, eschars, and crusts are examples of secondary lesions.⁴

The most common lesions on the oral mucosa are ulcers. An ulcer is a lesion formed due to loss of oral soft tissue's continuity or loss of thickness of the epithelium to exceed the stratum basalis. The center of the lesion is initially red, and it turns gray and white after being covered with a fibrin clot.²

Specifically, traumatic ulcers are ulcerative lesions on the oral mucosa caused by trauma or local factors. Traumatic ulcers can also be caused by mechanical, thermal, chemical, or galvanic

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trauma. Clinical manifestation of traumatic ulcers due to mechanical factors depends on the intensity and size of the cause. Usually, a mispositioned tooth, contact with the sharp surfaces of a broken tooth, or an improperly placed prosthesis cause physical trauma. While chemical trauma can be caused by dental materials, such as mouthwash with high alcohol content, eugenol, and phenol, thermal trauma is caused by hot food and drinks.⁵ It is usually a single ulcer, oval, yellow-gray or white-grey in the center with an erythematous margin.⁶ One of the mechanical factors that can cause traumatic ulcers is the use of uncontrolled orthodontic appliances.

Aside from having a very useful function for the mouth, orthodontic appliances also have disadvantages, such as causing irritation and physical damage to the oral mucosa because of clasps and rough plate surfaces with sharp edges. These trigger the occurrence of traumatic ulcers in users of fixed orthodontic appliances.⁷ In Indonesia, the prevalence of traumatic ulcers reaches 93.3%, which is quite high compared to other oral lesions. Many complaints of ulcers are found in the oral soft tissue of patients, users of fixed orthodontic appliances, in which the wires and the braces are the components that most often cause traumatic ulcers, with a percentage of 56.3% of 61 patients using fixed orthodontic appliances.⁸

Hence, this case report describes a traumatic ulcer due to using fixed orthodontic appliances that are not controlled for a long time, exacerbated by moderate oral hygiene and thermal trauma when drinking a hot beverage.

CASE REPORT

A 22-year-old woman with moderate oral hygiene came to Oral Medicine Department RSGM Nala Husada with complaints of multiple sores on her lower lip, which was painful. This ulcer appeared four days before her first visit. Based on the history, there was also a slight impact (the gadget fell off) in the area of

her lower lip while she was sleeping, and the ulcer got wider after she drank a hot beverage.

Her physical condition was good. Vital signs: Blood pressure 110/70 mmHg, pulse 80x/min, and body temperature 36.5°C. No systemic disease was reported. The submandibular lymph nodes were palpable, supple, immobile, and painless. Intra-oral examination: multiple ulcers (\pm 10-15 mm), erythematous margin, and concave yellow base. There were fixed orthodontic appliances (only braces, no wire and power O/chain) on the lower teeth around the lesions and calculus on the lower teeth.

Case Management

First Visit (June 8, 2022): 1) After anamnesis and extra-oral and intra-oral clinical examination, the dentist diagnosed the patient's traumatic ulcer. 2) The wound area was cleaned using a 1.5% hydrogen peroxide solution to remove debris covering the ulcer. Then, the ulcer area was dried and isolated using cotton rolls. 3) 10% povidone-iodine was applied to the ulcer margin area. 4) 0.1% Kenalog was applied in oral base paste on the surface of the ulcer using a cotton pellet or micro applicator. 5) The cotton rolls were removed, and the patient was instructed not to eat, drink, or rinse for 30 minutes after applying the Kenalog. She was only allowed to spit if it felt uncomfortable. 6) The patient was prescribed medication for home use, consisting of 0.1% Kenalog in oral base paste (three times a day) as an anti-inflammation covering agent, BecomC caplet (once a day) as a supportive therapy, and 0.12% Chlorhexidine gluconate gargle (two-three times a day) as an antiseptic agent. 7) The patient was educated about the diagnosis of the case and complained of things that should be done to support the healing process (control fixed orthodontic appliances, removed if necessary to eliminate the main causative factor), the importance of improving dental and oral hygiene, and the actions to be taken next to

support ulcer healing. 8) The patient was instructed to return for ulcer control and evaluation one week later.

Second Visit (June 15, 2022): 1) The patient came for post-therapy control, which was done for a week. The ulcer was no longer too painful; the diameter was smaller, although it had not healed completely. 2) Only the ulcers were cleaned and treated again like the first visit because the patient did not want to remove the orthodontic appliance. 3) The wound area was cleaned using a 1.5% hydrogen peroxide solution to remove debris covering the ulcer. Then, the ulcer area was dried and isolated using cotton rolls. 4) 10% povidone-iodine was applied to the ulcer margin area. 5) 0.1% Kenalog was applied in oral base paste on the surface of the ulcer using a cotton pellet or micro applicator. 6) The cotton rolls were removed, and the patient was instructed not to eat, drink, or rinse for 30 minutes after applying the Kenalog. She was only allowed to spit if it felt uncomfortable. 7) The patient was instructed to continue taking the prescribed medication and vitamins regularly. 8) The patient was instructed to return for ulcer control and evaluation one week later. 9) DHE.



Figure 1. The appearance of ulcers on the patient's lower labial mucosa on the first and second visits

Third Visit (June 22, 2022): 1) The ulcer on the left side has been completely healed. 2) The ulcer on the right side was

shallow, with no pain, and the diameter was smaller, although it had not healed completely. 3) The fixed orthodontic appliance was removed (according to the patient's consent). 4) Scaling (calculus cleaning) was performed on the patient's teeth, especially the lower teeth. 5) The patient was instructed to continue taking the prescribed medication and vitamins regularly. 6) The patient was instructed to return one week later for ulcer control and evaluation. 7) DHE.

Fourth Visit (June 29, 2022): 1) The ulcer on the left side has been completely healed, with no pain or scar. 2) DHE. 3) Patients were educated about consuming nutritious food daily to support oral and overall body health.



Figure 2. The appearance of the patient's lower labial mucosa on the third and fourth visits

DISCUSSION

Trauma to the oral mucosa is the first step in developing traumatic ulcers.

The degree of susceptibility of a person's oral mucosa, the frequency of exposure to trauma, and the extensive tissue involved all affect the likelihood that an ulcer would develop from trauma to lesions.^{9,10}

Eliminating the cause is a crucial step that must be addressed to help the healing of a traumatic ulcer. It is also necessary to provide education related to oral hygiene and follow-up on patient complaints. Without eliminating the causative factors, traumatic ulcers will not heal completely; they can become recurrent or persistent ulcers that can lead to malignancy; predisposing factors are alcoholism, tobacco use, chewing betel nut, ultraviolet, and poor oral hygiene.^{11,12} In this case, using orthodontic appliances serves a highly practical purpose for the oral cavity but also has drawbacks that, if not addressed appropriately, might harm the oral mucosa physically. Irritation due to orthodontic appliance components, such as wire/clammer and rough plate surfaces with sharp edges, can cause tissue damage (ulceration) of the oral mucosa.¹³

Additionally, the body has a physiological response to the wound called the process of wound healing. Tissue healing in wounds is a complex and dynamic process involving tissue environment changes and the status of one's health. Physiologically healing of oral mucosal tissue will occur through the basic stages, including hemostasis, inflammation, proliferation, and maturation.¹⁴ The most important cell of all of these processes are macrophage cells, which function to secrete pro-inflammatory and anti-inflammatory cytokines and growth factors, fibroblasts, and their ability to synthesize collagen, affecting tensile strength of the wound and filling the wound tissue return to its original form. Then, it was followed by skin keratinocytes cells to divide themselves and migrate to form re-epithelialization and cover the wound area.¹⁵ A wound is said to heal completely if the wound has been returned to tissue anatomy structure, tissue

function, and appearance normally in the appropriate period.¹⁶

In general, managing traumatic ulcers is in the form of palliative (curative) therapy. The goal is to eliminate or reduce pain.¹⁷ The principles of traumatic ulcer management are to eliminate pain and discomfort to the patient, shorten treatment time, speed up healing time, and reduce the size of the lesion.¹⁸

Further, wound care requires technique and medicine to speed up wound healing and prevent infection. Povidone iodine is a good antiseptic (kills germs) for bacteria, gram-positive or negative. Povidone iodine 10% is commonly used for general wound care as a disinfectant.¹⁹ In this case, the pharmacological treatments were Kenalog 0.1%, BecomC Caplet, and chlorhexidine gluconate 0.12% gargle. Kenalog contains triamcinolone acetonide 0.1%, synthetic corticosteroids with anti-inflammatory, anti-itch, and anti-allergic effects. Kenalog is also a topical anti-inflammatory drug that relieves inflammation associated with oral inflammatory lesions, ulcerative lesions, and oral trauma and can reduce pain.²⁰ Then, BecomC is a supportive therapy consisting of a multivitamin of vitamins B complex and C. The composition of BecomC is Vitamin B1 50 mg, Vit B2 25 mg, Vit B6 10 mg, Vit B12 5 mcg, Calcium Pantotenat 18.4 mg, Nicotinamide (Vit B3) 100 mg, and Vitamin C 500 mg. BecomC plays a vital role in the healing period. Particularly, one of the functions of vitamin C is collagen formation. Collagen is a protein compound that affects structural integrity in all connective tissue, so vitamin C plays a role in wound healing. In addition, vitamin C prevents infection because it can increase the body's resistance to infection.⁴

Therefore, dental health education aims to provide information on properly improving oral hygiene and health. To prevent injury and accelerate healing, patients are recommended to consume vegetables and fruits.

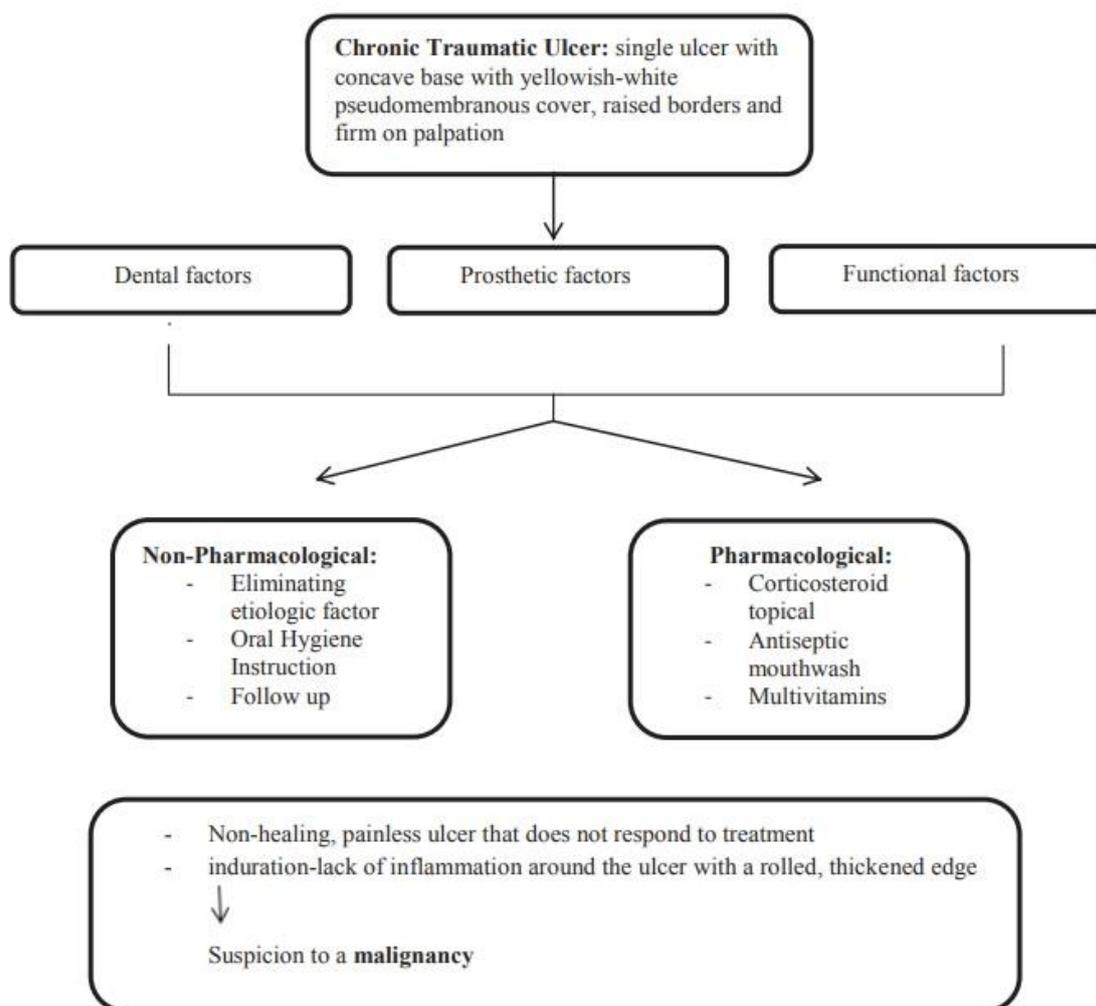


Figure 3. Diagram of case management of traumatic ulcer.²⁰

CONCLUSION

Ulcers completely heal without scars and without pain due to proper case management, starting from history taking, clinical examination, and pharmacological and non-pharmacological management in the form of education and action to eliminate the causative factor. Appropriate case management can also help a dentist to determine whether there is a risk of malignancy in an ulcerated lesion.

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