




# Non-Healing Chronic Traumatic Ulcer, an Entity That Can Resemble Other Chronic Ulcers

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**Introduction:** Traumatic ulcer commonly occurs in the oral cavity, resulting in the loss of the entire epithelium. Traumatic ulcers often appear to mimic other lesions of the oral mucosa but the causative factors and other characteristic features rule out the differential diagnosis. It may have a similar appearance to some oral ulcer lesions such as traumatic ulcer granuloma with stromal eosinophilia (TUGSE) and oral squamous cell carcinoma (OSCC).

**Objective:** To identify traumatic ulcers from other chronic lesions such as TUGSE and OSCC.

**Case:** First case, a 63-year-old female complained of pain on the right side of the tongue for 4 months. Intraoral examination showed a painful single ulcer, mild keratosis white halo, and induration on the right lateral of the tongue. The second case, a 38-year-old male complained of pain on the left side of the tongue for 2 months. Intraoral examination showed a painful single ulcer, mild keratosis white halo, and induration on the left lateral of the tongue. In both cases, there were some retained roots where the ulcer was located, and due to its contact with lateral of the tongue and the appearance of the lesion, we got a provisional diagnosis of traumatic ulcer.

**Case Management:** These ulcers had a visual appearance similar to OSCC and TUGSE, so eliminating etiological factors and a comprehensive treatment plan were needed. We planned to extract teeth close to the lesion that was suspected to be the etiology of traumatic ulcer. We also prescribed 0.1% triamcinolone acetonide in orabase to improve healing. One week later, the ulcer in both patients had healed.

**Conclusion:** Recognition of traumatic ulcer characteristics is crucial in eliminating local factors to get rid of any differential diagnosis.

**Keywords:** characteristic, local factor, traumatic ulcer

## Introduction

In the oral cavity, traumatic ulcer is an ulceration that occurred due to trauma, either acute or chronic.<sup>1</sup> The causes of traumatic ulcers are mechanical, chemical, electrical, and thermal trauma, and can also occur due to factors in the oral cavity such as fillings, malposition or malformation of teeth, or fractured teeth.<sup>2</sup> It has slightly raised and reddish borders covered with a yellowish-white necrotic pseudo membrane that can be wiped off. The tongue, lips, and buccal mucosa are where traumatic ulcers most frequently occur. Men are more likely than women to develop traumatic ulcers with the ratio is 2.7:1).<sup>3</sup> These lesions can occur for several days but can also persist for several weeks, especially if they occur on the lateral side of the tongue because the movement of the tongue traumatizes the area repeatedly.<sup>3</sup>

Traumatic ulcers typically painless three days after the injury has healed and usually heal in 10 days.<sup>3</sup> Due to recurrent insults to the tissues, these lesions may last for a few days – or even several weeks, particularly in the case of tongue ulcers. Chronic traumatic ulcers generally have a characteristic appearance in the form of a single ulcer with irregular edges, a slightly concave yellowish base, sometimes accompanied by induration, and oval shape.<sup>4-6</sup>

The diagnosis of traumatic lesions may be difficult due to the range of their etiology and clinical manifestations. Multiple entities, such as OSCC and TUGSE, are included in the differential diagnosis of a single oral ulcer especially when the ulcer occurred on the lateral of the tongue.<sup>7</sup> This case report presents two cases of traumatic ulcers that

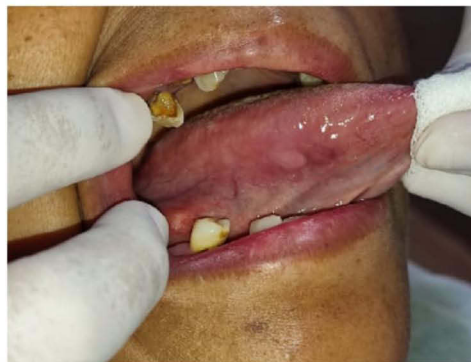
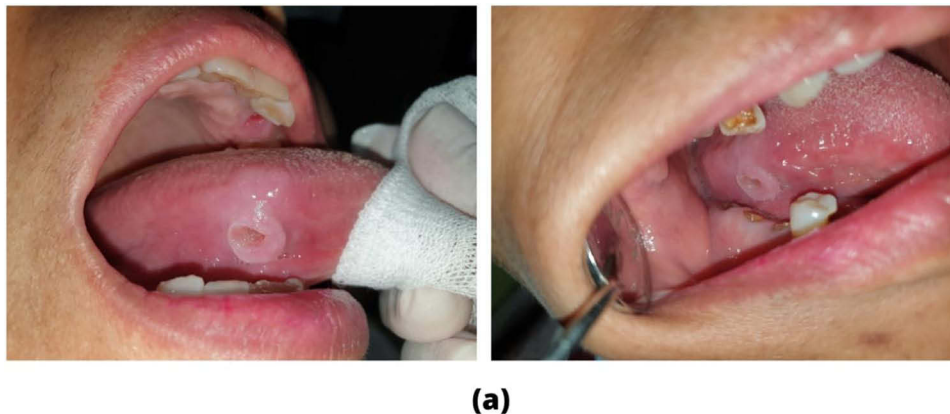
resembling with OSCC and TUGSE and describes how to differentiate the lesions. The traumatic ulcer lesion sometimes appears similar to other oral lesions such as OSCC and TUGSE, so it is a challenge to make the diagnosis establish.

## Case Presentation

### Case 1

A 63-year-old female complained of pain on the right side of the tongue for 4 months. The pain was continuous and interfered with eating especially while eating hot and spicy foods. She had no history of smoking or alcohol abuse. The ulcer was initially small and gradually progressed to the present size for 2 months. On extraoral examination, the normal color of the conjunctiva was noted, and submandibular and cervical lymph nodes were not palpable. On intraoral examination, there was a single ulcer, size 1 x 1.5 cm, which had a similar color to adjacent mucosa except for the border of the ulcer. The border of the ulcer was elevated, paler in color than the surrounding tissue. The area near the border of the ulcer, 1–2 cm from the border of the ulcer looked pale. No bleeding or suppuration was noted (Figure 1).

On palpation, it was firm with indurated and keratotic borders and a base fixed to the underlying structures. She had no history of fever before the ulceration. In the area of the tongue where the ulcer was located, there were some sharp retained roots of the teeth, and due to its contact with the lateral right of the tongue, we got a provisional diagnosis of traumatic ulcer of the right lateral of the tongue. But as it presents clinically as a large ulcer with the rim of hyperkeratosis and induration, we suggested differential diagnosis with OSCC. We also suspected the lesion as TUGSE because it occurred the most on the lateral of the tongue. We planned to extract the retained root and followed up a week later. A week later after extracting the teeth, the ulcer disappeared.



(b)

**Figure 1** (a) Traumatic ulcer on lateral right of the tongue. There were some retained teeth close to the ulcer. (b) One week after first visit, the ulcer healed.

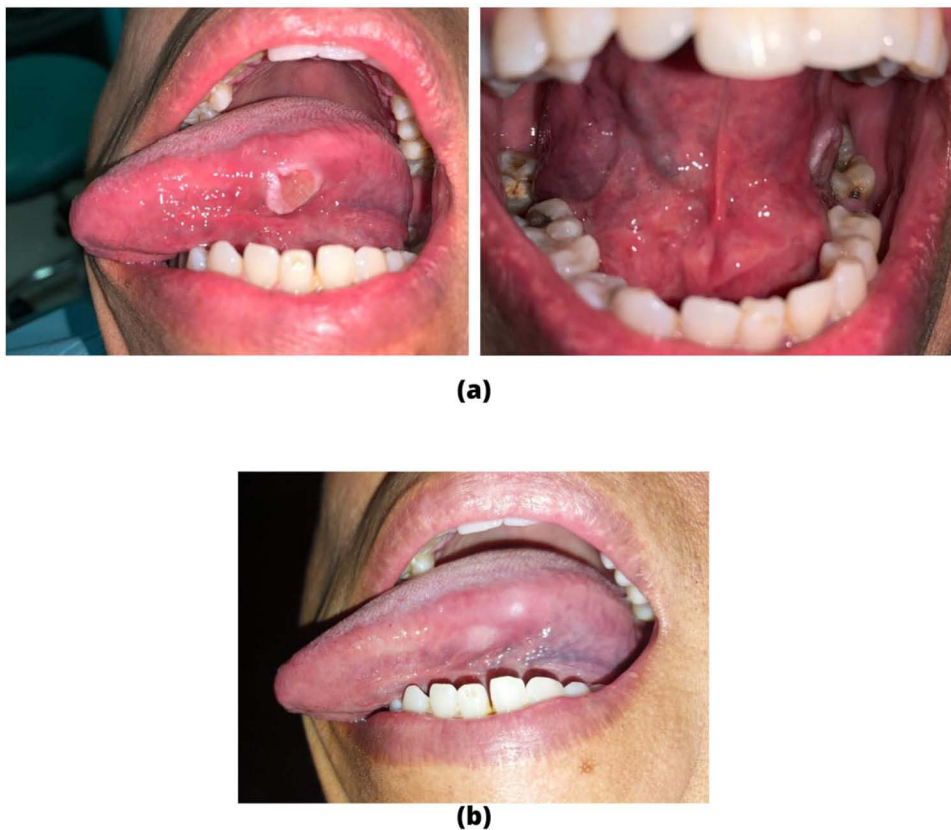
## Case 2

A 38-year-old male complained of pain on the left side of the tongue for 2 months. He felt difficulty in eating and speaking. He is a smoker but not an alcohol abuser. On extraoral examination, the normal color of the conjunctiva was noted, and submandibular and cervical lymph nodes were not palpable. Intraoral examination revealed a painful single ulcer, red base, indurated, with a white elevated border surrounding the ulcer. No bleeding and suppuration were noted. On palpation, it was firm. He had no history of fever. In the area close to the ulcer, we found a sharp root of 36, and due to repeated insults to the lateral of the tongue where the ulcer is located, we got a provisional diagnosis of traumatic ulcer. The clinical presentation of this ulcer resembles OSCC and TUGSE because of the similar appearance. We planned to extract the retained root. Two weeks after extracting the teeth, the ulcer disappeared (Figure 2).

## Discussion

The appearance of traumatic ulcers varies expressively, it can be ambiguous with other oral ulcers, especially OSCC and TUGSE. The rim of hyperkeratosis and induration in traumatic ulcers may mimic squamous cell carcinoma.<sup>8</sup> The origin of oral ulcers that may be traumatic is not biopsied. Traumatic ulcers should disappear within two weeks of the injury's factor being eliminated. This duration may be extended, particularly in people with impaired immune systems. A histological examination is necessary for any suspicious lesions or non-healing ulcers.<sup>7</sup>

Persistent inflammatory factors that cause non-healing ulcers have a relationship with the development of OSCC.<sup>9</sup> Suspicion of lesions other than traumatic ulcers and the ability to diagnose is very important in the proper management. With a male-to-female ratio of 1.7:1.2, oral cancer ranks as the seventh most frequent malignancy.<sup>10</sup> A type of tumor known as oral cancer can develop anywhere in the mouth cavity, pharynx, or salivary glands. The second most frequent oral cancer is tongue cancer, which primarily affects males in their sixth and seventh decades of life.<sup>11</sup> Abuse of alcohol and tobacco products is the main risk factor for this condition. The lateral edge of the tongue's anterior two-thirds is the



**Figure 2** (a) Traumatic ulcer on lateral left of the tongue. There were 36 retained roots located next to the ulcer. (b) Two weeks after first visit, the lesion healed.

location where it is most common. In the lateral border of the tongue, carcinoma is 25–50% common. Over 90% of oral cancers are caused by OSCC.<sup>12</sup> Most often, it affects elderly males in their fifth to ninth decades. Clinical diagnosis of oral squamous cell carcinoma is impossible. The gold standard for determining an oral squamous cell carcinoma diagnosis is by performing a biopsy and examining the results under a microscope. For an appropriate therapeutic approach and in the evaluation of prognosis, it is critical to identify oral dysplasia to validate the clinical suspicion of early invasive cancer or determine the grade of differentiation of oral squamous cell carcinoma.<sup>13</sup> In OSCC, the 5-year overall survival rate has not greatly increased in recent years. The rates of survival overall and in the absence of disease are 56% and 58%, respectively. Establishing an early diagnosis at the first stage of the disease is the most crucial responsibility.<sup>11</sup> OSCC can manifest clinically in any number of forms. Its edges are elevated and indurated, or it may have developed into a broad-based exophytic mass with a surface that may be verrucous, pebbly, or relatively smooth. OSCC bleeds easily after trauma and frequently develops secondary infections. Except when secondary infections are present, OSCC is typically harmless. Large lesions can interfere with normal swallowing, mastication, or speech. At the time of diagnosis, almost two-thirds of oral SCC are already big and have clinically discernible metastases to the cervical lymph nodes. Affected lymph nodes are firm and painless to palpate, and if connective tissue nearby has been affected by extracapsular dissemination, they become fixed.<sup>12</sup>

Strong evidence emerged in a recent study to establish the link between chronic inflammation and the development of cancer. Multiple factors, including DNA damage, cytokines, human papillomavirus infection, genetic alterations, smoking, alcohol, and others, may play a role in the mechanism of developing OSCC after mucosal trauma.<sup>11</sup> OSCC growth has previously been linked to non-healing ulcers caused by persistent inflammatory factors. There are several types of oral lesions that can develop as a result of chronic mechanical irritation (CMI) of the oral mucosa, including Chronic Traumatic Ulcer (CTU).<sup>8</sup> According to a study by Gilligan et al, a group of non-healing CTUs contained immunohistochemistry patterns of cell differentiation and proliferation that were similar to those seen in OSCC and reported in earlier OPMD research.<sup>8</sup> Chronic inflammation can result in long-lasting tissue damage and modifications in the inflammatory cell types. Inflammation and cytokines in the tissue microenvironment considerably enhance the risk of cancer. Furthermore, the development of oral cancer is strongly affected by inflammatory mediators such as nuclear factor kappa B, vascular endothelial growth factor, inflammatory cytokines, prostaglandin pathways, p53, reactive oxygen, nitrogen species, and microRNAs.<sup>11</sup> Chronic inflammation has been shown to cause significant DNA damage, which has been associated with the development of cancer. As a result, alterations in inflammatory-cell populations and cytokine levels in local tissues may allow chronic inflammation to have an impact on the initiation, development, invasion, and metastasis of tumors.<sup>14</sup>

Numerous etiologic causes, such as infections, immunological dysregulation, trauma, and tumors, can lead to oral cavity ulcerations. Since benign ulcerative lesions might be mistaken for neoplastic ulcerated lesions in the oral cavity, biopsy is crucial for determining the diagnosis in cases while the lesions are not clinically recognizable or do not respond to treatment as expected. For the definitive diagnosis of some ulcerated lesions, particularly autoimmune lesions, adjunctive tests may be necessary. In many situations, careful clinical, medical history, and clinical examination can result in a solid clinical diagnosis. However, to confirm the diagnosis or rule out neoplastic causes, a biopsy and/or further adjunctive tests may be required.<sup>14</sup>

OSCC frequently manifests as a non-healing ulcer, although it can also seem as an uneven leukoplakia or a red area. Clinical similarities may lead to the suggestion of two more differential diagnoses. At first, it can be assumed that the patient's reported pain is a result of the trauma.<sup>15</sup> Through an appropriate assessment of the case history, clinical examination, and investigation, an accurate diagnosis will be obtained. It is crucial to carry out anatomical histological exams, such as punch biopsies, micro brushes, excision, and/or incision biopsies, if the ulcer persists two weeks to eliminate OSCC.<sup>10</sup> Although they are uncommon, oral soft tissues or jawbones can develop metastatic cancers. The lymphatic system plays a major role in the lymph nodes of the deep cervical chain in the metastatic spread of tongue cancer. The lymph nodes that are most commonly affected are those in the submaxillary and submental regions. Prolonged ulceration with hardness and peripheral infiltration, either in conjunction with vegetation or a reddish or whitish stain, is the characteristic of a metastatic lesion.<sup>16</sup>

TUGSE and traumatic ulcers have similar features. TUGSE is a self-limiting, benign, chronic lesion of the oral mucosa that appears as an ulcer with raised borders. The tongue is the most frequent site, but the lesions can occur in other sites in

the oral mucosa.<sup>17</sup> Clinically, TUGSE frequently appears as an ulcer with raised and indurated borders and a yellowish fibrinous base. TUGSE can either present asymptotically or be associated with mild to severe pain. Since it grows quickly, it is frequently thought to indicate a malignant process, such as squamous cell carcinoma. Histological and clinical findings should be taken together to determine the definitive diagnosis.<sup>18</sup> TUGSE frequently manifests as a single, painful or silent ulcer that may persist for weeks or months. Although it can occur at any age and is known as Riga-Fede disease if discovered in neonates or infants, it is most frequently diagnosed in the fifth decade of life. Although trauma is the main cause of TUGSE, other potential causes include sharp tooth margins, poorly fitting dentures, and incisional biopsies.<sup>19</sup>

TUGSE's pathophysiology is still in controversy. Mucosal trauma—whether external or internal, physical, chemical, thermal, or electrical—appears to be the primary initiating factor of this lesion among all the etiological factors. According to earlier research, not all TUGSE lesions are caused by trauma. The lesion presents clinically and histologically as an ulcerated lesion with an intense immune response. Sheets of atypical mononuclear cells (mostly T-cell lymphocyte population), eosinophils, macrophages/histiocytes, and a few plasma cells can be seen in the inflammatory infiltrate in TUGSE. These atypical mononuclear cells were identified in earlier research using immunohistochemistry as being of macrophage and myofibroblast origin. Recent investigation suggests that these cells have a T lymphocyte function because they are immunohistochemically positive for all T-cell-specific antigens. TUGSE is now recognized as a reactive lesion characterized by a predominantly clonal T-cell population. Due to its capacity to mimic malignancy, this lesion needs special attention. It is still unclear exactly what these inflammatory cells are doing to cause such an elevated inflammatory response that mimics cancer. According to research that has been correlated, this is similar to a hypersensitive reaction (predominant T-cell infiltration demonstrating a sort of delayed cell-mediated immunity).<sup>18</sup> Most often, traumatic antigens that act as antigen-presenting cells for existing macrophages and histiocytes cause traumatic ulcerative granulomas with stromal eosinophilia. Toxins, viruses, bacteria, endogenous degradation products, or foreign proteins are only a few examples of antigens. Eosinophils and lymphocytes are attracted to the submucosal tissue as a result of the release of cytokines. Though most traumatic ulcers lack eosinophilic infiltration, earlier research indicates that the precise presence of eosinophils is still up for debate. On the other hand, some other investigators came to the conclusion that the aggressiveness of TUGSE is indicated by the higher predominance of histiocytes and eosinophils than lymphocytes. As the degranulating eosinophils release cytokines and other harmful substances, the growing T-cell population increases, continuing the cycle of reaction. Tissue damage is the outcome of the accumulation of all these inflammatory cells and a wide variety of cytokines.<sup>19</sup>

TUGSE is distinct for having a slow-healing ulcer, unusual mononuclear cells, and significant eosinophilia. When an unknown antigen enters through mucosal damage, eosinophils appear to be reactive tissue reactions. Eosinophils in the inflammatory infiltrate of TUGSE release less transforming growth factor than eosinophils in other traumatic ulcers, which may explain why the healing process is taking longer. Furthermore, eosinophils secrete a variety of cytokines, such as tumor necrosis factor, which causes additional tissue damage.<sup>19</sup>

The main approach to managing traumatic ulcers is removing the risk factor, however, corticosteroids are also often recommended. A fluorinated prednisolone derivative with medium to high efficacy, triamcinolone acetonide is considered an intermediate-acting glucocorticoid.<sup>20</sup> It is effective successfully for many inflammatory disorders of the mouth, including traumatic ulcers. Orabase contains triamcinolone acetonide, which is used as an adjuvant therapy and as a short-term pain reliever for symptoms related to oral inflammation.<sup>21</sup> Although regulating oral hygiene and eradicating the source of oral mucosal irritation is essential, all patients should also prioritize early detection of oral lesions, advanced studies, and a holistic approach. Dentists and specialists in oral medicine can make a significant difference and perhaps save a patient's life. Information about oral health care and early detection of mucosal lesions is very important. The patients have approved and written the informed consent of case details and all images for the publication of this report. This case series complied with the Declaration of Helsinki. The institution has also approved the publication of this case report.

## Conclusion

Traumatic ulcer is one of the commonest solitary ulcers presenting in the oral cavity, often mimicking some oral ulcers, especially in chronic lesions. It heals after the predisposing factor is removed and it usually presents with no significant symptoms.



Recognition of traumatic ulcer characteristics is crucial in eliminating local factors to get rid of any differential diagnosis. Since the occurrence of OSCC has previously been linked to non-healing ulcers brought on by persistent inflammatory factors, complete history-taking and careful clinical examination include palpation of the ulcers are mandatory. Careful examinations are carried out in order to establish the diagnosis and management of the lesion to be precise so that the better prognosis is achieved.

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## Disclosure

The authors declare no conflicts of interest in this work.

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