

Classification and Management of Oral Traumatic Lesions: A Comprehensive Review

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Abstract: *The oral mucosa is often traumatized by some physical and chemical factors. The majority of these traumatic injuries clinically present as ulcers or less often as lesions protruding above the adjacent healthy tissues. The most common locations for these lesions are the buccal mucosa, tongue and lips. Due to the variety in disease progression and macroscopic appearance they can be classified according to their etiology, appearance and clinical course. The most common oral traumatic lesions (OTL) present as a structural defect of the soft tissues, demarcated from the surrounding healthy tissue and have a bottom that is covered with damaged surface epithelial cells. OTL should be differentiated with many other diseases with viral, neoplastic or reactive genesis, while the treatment includes a complex of measures, the major of which is removal of the causative factor that led to their occurrence. Traumatic lesions are part of the dental practice due to the essence of the profession, as well as the features of the oral region.*

Keywords: oral mucosa, traumatic injuries, oral traumatic lesions, etiology, clinical course

1. Introduction

Due to their anatomic position, high vascularization and the various functions of the oral cavity, the oral mucosa is exposed to different types of injuries (39). Traumatic ulcers are among the most common mucosal lesions in oral medicine, often they are highly painful, disrupting the everyday rhythm of life and occupational activities, which urges patients to seek help from a specialist (40). Oral erosions are characterized by partial loss of thickness of the epithelium, unlike ulcerations or ulcers, which include complete desquamation of the epithelium, accompanied by variable loss of the underlying connective tissue. As a result, there is a crater - like lesion, which may include edema and proliferation of the surrounding tissues (41). Other traumatic lesions present as exophytic formations, developing on a wide base or on a peduncle. Most oral traumatic lesions have a chronic course, but there are ones that develop from an acute one - time trauma during talking, eating or other activities (8, 42). Lesions in relation with dentistry have some characteristic features in their etiology and clinical course.

Aim

The purpose of the current article is to analyze the available data in the literature regarding the etiology, clinical presentation and treatment of the most common oral traumatic lesions in the dental practice.

2. Materials and Methods

In order to accomplish the aforementioned aim, we reviewed available sources in the Google Scholar database published between 2000 and 2023, using keywords "oral trauma lesions, oral trauma, oral mucosal lesions, dental medicine". Among the obtained results we picked 51 articles fulfilling the set criteria.

3. Results

Based on the conducted review of literature the following conclusions, characterizing OTL, have been drawn:

Frequency of oral traumatic lesions

Traumatic ulcers are most commonly seen on the tongue, lips and buccal mucosa. According to Chen (36) the most common location for traumatic lesions is the buccal mucosa (42%), followed by the tongue (25%) and lower lip (9%). Other locations are the hard palate, gingiva of the upper and lower jaws and the sublingual region (37, 38). Upon examination of patients with orthodontic appliances it has been reported that 47% of adults suffer from oral lesions as the most troubling orthodontic issue, while 29% of adolescents rank them as second most common disturbance during orthodontic treatment (1, 2).

Other than orthodontic patients, this type of suffering is seen among people with removable dentures. Traumatic ulcers, caused by dentures with an imbalanced occlusion can be seen among 5% of such patients. Similar percentages have been reported by other authors as well, which indicates that removable dentures are an important factor in the development of traumatic lesions in the oral region (39, 6).

Traumatic ulcers or decubital injuries are a common finding after placement of a new removable denture. The reasons for this are overly widened edges of the prosthesis or the presence of retentive areas on the alveolar ridge. The frequency of this condition is relatively high and the incidence of traumatic ulcers could range between 3, 5% and 16% among patients with removable partial dentures and 25% for patients with complete dentures (7).

In the daily dental practice common occurrences are also chemical injuries from solutions and materials for root canal disinfection, devitalizing agents, whitening agents or mechanical or thermal injuries from rotary instruments used in oral surgery for tooth extraction or other invasive procedures. According to Girish et al. (3) injuries to the oral attached mucosa could present as gingival recessions.

Biting and sucking of the lips, cheeks and tongue are another reason for the occurrence of traumatic lesions. Woo, Sook - Bin and Dorothy Lin identify 56 lesions associated with "morsicatio mucosae oris" (MMO). The patients that they examined were aged 14 - 85 years. Most injuries occurred

between the third and sixth decade of life. Thirty (53, 6%) and eighteen (32, 1%) of 56 lesions were localized on the lateral parts of the tongue and the oral mucosa, respectively. MMO have been reported among young patients between the second and third decade of life. Their distribution has been evaluated at 6% among people aged 12 and younger, with an equal sex distribution; 4, 6% among adolescents aged 12 - 24 years (majority of whom below 20 years old); 1, 7% among the common population and 1, 8% among patients aged 15 - 19 years old (20).

Etiology:

Ulcerations in the dental practice could be caused by chemical, thermal, electrical or mechanical factors (8).

Mechanical trauma: Injuries could result from fractured or decayed teeth, improperly placed crowns or restorations. Dentures that don't fit properly can also cause traumatic lesions. Such ulcers are usually caused by dentures and can be seen in the buccal or lingual sulcus. The etiology of traumatic lesions is often accidental injury. If the causative agent is a sharp edge of a fractured tooth, the lesions are usually seen on the tongue or buccal mucosa. Other common causes are improper handling of extraction forceps and elevators, application of cautery instruments and many more (8).

Chemical injuries: Oral ulcerations related to dental restorative materials, local anesthetics, sodium hypochlorite, formocresol, local effects of drugs such as aspirin, oral care products such as hydrogen peroxide, denture cleaning materials, mouth rinses (3, 10, 12).

Thermal and electric injuries: The most common thermal trauma is that of the lips upon contact with high - temperature substances, but it could also be due to extremely low temperatures (cryogenic burns), for example from contact with frozen metal, ice or liquid nitrogen. Thermal burns are most commonly caused by consumption of hot foods or beverages and affect the anterior third of the tongue and palate. Electric trauma could be seen among children left unattended or during industrial or operating incidents (3).

Classification of traumatic lesions

Traumatic ulcers are usually classified according to the mechanism and etiology of their occurrence. They can be defined as acute or chronic (38, 8).

Baricevic, Marinka, et al., in their work on traumatic lesions among orthodontic patients, divide the injuries of the soft tissues in the oral cavity into erosions, ulcerations, contusions and desquamations. This division describes the depth reached by the causative agent in the soft tissues, as well as the macroscopic appearance of the lesion (28).

Santosh, Arvindetal. (19) propose their own clinic - pathological classification of oral exophytic lesions. Their work attempts to classify those lesions based on:

- The nature of the pathology
- Relation to adjacent bone
- Histological characteristics of the lesions

While Mortazavi, Hamed et al. characterize the common oral lesions, dividing them into acute, chronic and recurrent ulcers, which subdivide into five groups: single acute, multiple acute, single chronic, multiple chronic and single/multiple recurrent, based on the number and duration of the lesions. Traumatic ulcers are found in the single acute oral lesions group (36).

Clinical characteristics of oral traumatic lesions

According to their appearance and clinical presentation OTL could be divided into defects of the integrity of soft tissues and exophytic lesions, which develop on a wide base or peduncled, protruding above the surrounding healthy tissues. The clinical presentation of a traumatic ulcer is a slightly to moderately painful lesion, with a yellow - ish bottom, fibrinous center, erythematous and inflamed border which may or may not be thickened (43). The borders are usually slightly elevated and reddish, with a yellowish - white necrotic pseudomembrane, which can be easily removed. Ulcers developing on the lips have their surface covered with a crust. Traumatic ulcers normally become painless in the matter of three days after the injury and in most cases heal in 10 - 14 days (36).

Chemical injuries of the oral mucosa present as a coagulation necrosis of the soft tissues, covered with a pseudomembranous layer. There could also be a restriction of mouth opening as symptoms depend on the severity of the injury (3).

In every case the characteristics of the affected tissues depend on the type of causative agent, the exposure (time/duration of its contact with the tissues) and its concentration (in the cases of chemical ulcers) (3).

It is worth noting that the majority of traumatic lesions clinically present as a defect of soft tissue integrity while a small number are seen as exophytic lesions that protrude above the surrounding healthy tissues. In this group of lesions we can classify many entities such as the retention cyst of small salivary glands (mucocele), traumatic fibroma, traumatic granuloma etc. There is no consensus regarding the genesis of such lesions. Some authors believe trauma is a concomitant, aggravating factor (19, 20). These lesions are the subject to other studies due to the specifics of their occurrence and clinical course.

Differential diagnosis

The differential diagnosis of OTL is based largely on the thorough anamnesis and clinical examination. In order to differentiate oral ulcerations with other diseases with a viral or neoplastic genesis, attention should be placed on general symptoms such as having a fever and general indisposition, lymphadenopathy etc. The presence of some of the fore mentioned symptoms is often indicative of an infectious disease (36, 40).

Common among the population is recurrent aphthous stomatitis - a condition that presents with oral ulcers. The differential diagnosis between these two diseases is easy - based on the recurrent course of the aphthous stomatitis and also the depth of the lesions, which are superficial ulcers, not affecting the underlying tissues (39, 40, 41).

Other conditions affecting the soft tissues and clinically presenting as oral lesions are specific granulomatous diseases such as syphilis and tuberculosis, malignant diseases of the oral mucosa, as well as the salivary glands, systemic diseases such as the Wegener granulomatosis, lymphomas, dermatologic diseases with oral manifestations etc. (45, 46, 47).

Though rarely, when there is uncertainty regarding the given diagnosis, a histological examination is conducted in order to clarify the genesis of the lesion in question.

4. Treatment

The fundamental principle of treatment of OTL is removal of the etiological factor. Smoothing the edges of carious teeth and ill - adapted restorations, extraction of teeth in an atypical position, removal or correction of traumatizing removable dentures or orthodontic appliances are the most common examples of etiologic treatment of these lesions. All acute traumatic lesions heal without requiring treatment if the causative factor is removed and this happens for approximately 10 - 14 days. Chronic lesions don't always have a clear etiologic factor, therefore after removing the probable one suspicious lesions require a follow - up period of no less than 2 - 3 weeks (10, 43, 46).

The next stage is palliative and symptomatic treatment of traumatic lesions. It consists of preventing and avoiding plaque retention on the lesions in order to control bacteria growth and reduce the possibility of secondary infection. Gentle measures are taken for maintaining a good oral hygiene, rinsing the oral cavity with antiseptic solutions and local application of anesthetic agents. Local corticosteroids are also indicated. Their anti - inflammatory and immunosuppressive effects make them appropriate for the treatment of oral lesions. Local corticosteroids are preferred in order to reduce the side effects of their systemic application. They may be applied in gel form directly on the lesion, incorporated in a mouth rinsing solution or inhaled, the latter of which is rarely applicable for oral lesions (8, 11).

Regarding the diet, the patient is instructed to consume soft foods until the symptoms subside and the lesion fully epithelizes. Systemic application of antibiotics is rare, unless the lesions are extensive and/or affect the underlying tissues (3, 44).

For patients with xerostomia or dry mouth sialogenic (so called "sialogoga") substances are prescribed. Saliva has a protective function due to its contents (39).

Surgical excision is undertaken when a biopsy is required, as well as in the cases where the lesion causes functional or esthetic disturbances. In patients with removable dentures who have developed "epulis fissuratum" surgical excision is indicated before crafting new dentures. Other examples of such lesions are mucocele and traumatic fibroma - due to their size and location there is a risk of constant trauma of the oral tissues and recurrence of the lesion (16, 48, 49).

5. Discussion

The issue of traumatizing the oral tissues in one of global magnitude, which according to Ozelik, Onur M et al. is evaluated at 29 billion dollars annually (15). Traumatic lesions deteriorate the quality of life of patients and become a common reason for visiting a specialist (40). Due to their appearance and clinical course, certain lesions could be defined as malignant diseases, which instills fear in patients and is prerequisite for making diagnostic errors. This is mostly seen with exophytic traumatic lesions such as necrotizing sialometaplasia, traumatic granuloma etc. (46, 50, 51). For these instances an accurate diagnosis is given after conducting a histological examination. Such examination should undergo all other lesions that have not been affected by conservative treatment and don't heal after removing the etiological factor. Oral traumatic lesions are most commonly associated with patients who have removable dentures or orthodontic appliances (4, 14). Reasons for this include improper production of the prosthesis, imbalanced occlusion or trauma to the soft tissues due to the advancing alveolar ridge resorption. This is why timely check - ups should be followed so that corrections can be made where needed.

In the treatment process, other than removing the etiological factor (2), measures aiding in the epithelization of the lesion and reducing bacterial growth have their significance. Prescribing mouth rinses with chlorhexidine or betadine are useful in this regard. Systemic antibiotic use is rare, only in cases with deep and extensive lesions and immunodeficient patients (11, 12). Nowadays, laser therapy is often applied for the treatment of oral lesions. It entails significantly less pain and discomfort in the early postoperative period, reduced bleeding and is positively regarded by patients, including pediatric ones (31).

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