Oral mucosal lesions: a retrospective review of one institution’s 13-year experience

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Background/aim: To investigate the relative frequency of biopsied nonneoplastic oral mucosal lesions in Ankara, Turkey.

Materials and methods: Biopsy records of a single center from 2000–2012 were retrospectively collected. Diagnosis was recorded and evaluated with respect to patient demographics (age, sex) and location of the lesion.

Results: Of 11,980 biopsies, 1732 (14.5%) were mucosal nonneoplastic lesions. Hyperplastic lesions (n = 1000, 57.7%) with fibroepithelial hyperplasia in 30.9% of patients were the most common type of oral nonneoplastic lesions. The mean age of patients differed with respect to type of mucosal lesion, tending to be lower in patients with reactive lesions. Dermatoses showed a female predominance.

Conclusion: Our findings revealed that hyperplastic lesions were the most common among nonneoplastic oral mucosa lesions. Geographic and ethnic differences of patients with various types of oral mucosal lesions require further investigation.

Key words: Epidemiology, hyperplastic lesions, oral mucosa, reactive lesions

1. Introduction

The oral mucosa, including the gingiva, retromolar area, and buccal and palatal mucosa, is subjected to various local acute and chronic irritants and may be affected by more than 600 different systemic diseases (1). Since mucosal lesions are relatively common in oral pathology practice, oral tissue biopsies are frequently taken for pathologic examination. Except for extracted teeth, extirpated dental pulp tissue, and clinically normal tissue, all tissues removed from the oral and maxillofacial region should be submitted for histopathological examination as the gold standard for final diagnosis (2,3). Dentists and maxillofacial surgeons may encounter serious mucosal lesions, including leukoplakia/erythroplakia, oral lichen planus, vesiculobullous lesions, and oral candidiasis (4,5).

Most oral mucosal biopsies are taken from patients with reactive and/or inflammatory conditions. The oral mucosa may respond to a wide variety of local irritations by epithelial and/or fibrotic overgrowth (6). Nonneoplastic lesions, including peripheral giant cell granuloma, peripheral ossifying fibroma, pyogenic granuloma, and fibrous and/or epithelial hyperplasia, also called reactive lesions of the oral cavity, are the most common type of clinical entities (7). Hormonal changes may also affect the development of some of these lesions, including pyogenic granuloma, also called pregnancy tumor (8). Lesions frequently present as painless masses of variable size. Since this anatomical region is open to trauma, most lesions have ulcerated surfaces, which may give rise to suspicion of a malignant tumor in appearance (9).

The oral mucosa is also one of the most common locations for dermatoses, pigmented lesions, and viral diseases. Infection by oncogenic or nononcogenic viruses can cause several lesions in the oral mucosa. For example, human papilloma virus is responsible for papillomatous lesions, especially in the palatal mucosa (10,11). Immune-mediated vesiculobullous diseases, including lichen planus, are also not rare in the oral mucosa and may be malignant (12). Pigmented lesions of the oral mucosa may be iatrogenic, as in amalgam tattoo; congenital, as in ethnic pigmentation; or neoplastic, as in nevus and melanoma (13,14).

Understanding the distribution of oral mucosal lesions should be useful for better diagnosis and treatment. Ankara is the capital and the second largest city in Turkey, with 5 faculties of dentistry and more than 6 state dental hospitals serving as reference centers for all of Anatolia. The present study was therefore designed to evaluate relative frequency of biopsied nonneoplastic oral mucosal lesions in relation to patient demographics and localization of the lesion based on a retrospective review of the 13-year experience of a single center in Ankara.

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2. Materials and methods
This retrospective study evaluated the records of all patients who underwent oral mucosal biopsies at the Department of Oral Pathology, Faculty of Dentistry, Gazi University, Ankara, Turkey, between 2000 and 2012. The majority of specimens were stored at the Department of Maxillofacial Surgery of Gazi University, though some were stored at various state and private dental facilities in Ankara and nearby cities. All biopsies were diagnosed in our department, the only oral pathology laboratory in the region. Biopsies of gingiva, vestibule and buccal mucosa, palatine mucosa, and retromolar area were included in the study, whereas biopsies of the tongue and lips were excluded.

Data collected from medical records included patient age and sex and the site and type of the biopsy. Descriptive diagnoses were evaluated by 2 oral pathologists, who determined the final diagnosis.

A total of 1732 cases were added to current study with a mean patient age of 44.4 ±17.4 years, including 855 female and 877 male cases.

2.1. Classification of oral lesions
Reactive oral lesions were histologically classified using Neville's classification of common mucosal overgrowth (15). Lesions were classified as hyperplastic, reactive, and nonneoplastic pigmented lesions, and as dermatoses, lichen planus, and lichenoid reactions.

Hyperplastic lesions included fibroepithelial hyperplasia, irritation fibroma, epulis fissuratum, fibrous polyps, and cheek-biting lesions. Reactive lesions included peripheral giant cell granuloma, pyogenic granuloma, peripheral ossifying fibroma, and giant cell fibroma. Nonneoplastic pigmented lesions included amalgam tattoo, melanosis, and melanotic macule. Dermatosis included pemphigus vulgaris, mucous membrane pemphigoid, lupus erythematosus, and bullous pemphigoid. Lichen planus included all subtypes, such as bullous or erosive lichen planus and lichenoid reactions. Nonspecific inflammatory lesions such as epulis granulomatosa were excluded, as were benign and malignant tumors.

2.2 Statistical analysis
Due to the design of study, descriptive statistics were used to summarize the lesions' characteristics. Mean and standard deviation (SD) were used for quantitative variables; count and percentage were used for qualitative variables.

3. Results
3.1. Type of lesions
During the 13-year study period, 11,980 biopsies were evaluated, with 1732 (14.46%) of the lesions being nonneoplastic lesions of the oral mucosa. The remaining 10,248 lesions were diagnosed as nonspecific inflammatory processes, odontogenic cysts or tumors, jaw lesions, salivary gland lesions, and other benign and malignant tumors.

Hyperplastic lesions were the most common (n = 1000, 57.7%), followed by reactive lesions (n = 472, 27.3%), lichen planus and lichenoid reactions (n = 206, 11.9%), pigmented lesions (n = 35, 2.0%), and dermatoses (n = 19, 1.1%). Fibroepithelial hyperplasia (30.9%) was the most common hyperplastic lesion, whereas peripheral giant cell granuloma (13.4%) was the most common reactive lesion (Table).

3.2. Lesion distribution by patient demographics
The distribution of lesions by sex and age is shown in the Table. Mean (SD) age of the overall 1732 patients with lesions was 44.4 (17.4) (range: 5–92) years. Females (F) and males (M) accounted for 49.4% (n = 855) and 50.6% (n = 877) of the study population, respectively, with an M/F ratio of 1.02:1. Except for epithelial hyperplasia, all other mucosal lesions were more common in females. The mean age of the patients with reactive lesions was lower than those of the other groups.

3.3. Lesion distribution by location
Lesion distribution by location was known for 1674 of the 1732 lesions (Table). The most common site was the gingiva, accounting for 674 (38.9%) lesions, whereas the retromolar area (2.9%) was the least affected region. The buccal mucosa was the most frequent site of dermatosis and lichen planus when compared to other locations.

4. Discussion
The present retrospective cross-sectional study surveyed the biopsy records of histologically diagnosed oral mucosal lesions obtained by the Department of Oral Pathology of our institution over a 13-year period. Although several studies have assessed the prevalence of different types of oral mucosal lesions in different geographic areas (6,14,16,17), few studies have documented the range of histologically diagnosed lesions affecting the oral mucosa (18,19). Since definitive diagnosis requires histopathological examination (5), studies based on biopsy examination may be more reliable. Thus, the results presented here reflect the profile of histologically diagnosed oral mucosal lesions in the Turkish population. Moreover, earlier surveys only assessed specific oral lesions or syndromes, such as oral lichen planus or Behçet’s disease (20,21), whereas the present survey included several categories of oral mucosal lesions.

Given that only 3 previous studies to date have included more than 10,000 patients (3,19,22), the much larger scale of lesions surveyed (11,980) in the present study as compared to past studies (3,18,23,24) seems notable. Consistent with the data from previous studies (14), our findings indicated mucosal pathologies as the
most common type of oral mucosal nonneoplastic lesions. Although several retrospective studies have assessed the prevalence of oral mucosal lesions, few did so using the recorded files of biopsies obtained from patients in oral surgery and oral pathology departments (14,17,25). Few studies have assessed the epidemiology of oral lesions in Turkey; these include one study in a pediatric population (1) and a second in patients with lesions throughout the entire oral cavity (16).

While previous studies included either reactive lesions or gingiva lesions, aiming to evaluate the relative frequency of oral mucosal lesion in Turkey, all mucosal regions and all nonneoplastic reactive lesions were included in the present survey. Among the oral biopsy specimens that were obtained over the 13-year period, 14.5% were classified as nonneoplastic lesions of the oral mucosa. In comparison, other surveys have reported that 75.5% (17), 6.7% (25), and 41.6% (7) of lesions were nonneoplastic lesions of the oral mucosa. The percentage of these lesions tended to decrease as the number of lesions increased.

We found that the most frequent lesions in our population were hyperplastic lesions, including reactive hyperplasia of fibrous connective tissue and/or epithelia in response to local irritation or trauma. Traumatic fibroma and denture epulis occur beneath dentures (15). In this group, fibroepithelial hyperplasia, which is characterized by hyperplasia of fibrous connective tissue under an acanthotic epithelium, was the most common lesion (30.9%), followed by fibrous hyperplasia or fibrous polyp (16.2%). Focal fibrous hyperplasia accounted for 6.4% of 20,228 biopsies in Israel (25) and 61.05% of 1489 biopsies from China (9), but both included only gingival lesions (3). In contrast, we included buccal/vestibular lesions as well as gingival lesions, which may have accounted for the wider distribution of locations that we observed.

Focal, reactive lesions included peripheral giant cell granuloma, pyogenic granuloma, peripheral ossifying fibroma, and giant cell fibroma. These lesions are nonneoplastic but microscopically specific, developing in response to acute or chronic trauma, and appear as relatively common tumor-like growths of the oral mucosa. Peripheral giant cell granuloma, which originates from the periodontal ligament or mucoperiosteum, is the most common lesion of this type (26,27). Notably consistent with the fact that hyperparathyroidism may cause central giant cell lesions but not peripheral giant cell granuloma, it was determined that none of the 232 patients with peripheral giant cell granuloma had primary or secondary

<table>
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<th>Table. Patients’ demographics and lesion locations.</th>
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<td><strong>Age (years), Females, Location, n (%)</strong></td>
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<tr>
<td>mean (SD)</td>
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<td>46.8 (16.9)</td>
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<td>Fibroepithelial hyperplasia</td>
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<td>Giant cell fibroma</td>
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<td>Peripheral ossifying fibroma</td>
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<td>Pyogenic granuloma</td>
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<td>Peripheral giant cell granuloma</td>
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<tr>
<td>Lichen planus and lichenoid reactions</td>
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<td>Dermatoses</td>
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*: Percentage in lesion subgroup total.
**: Percentage in the entire group (1732 patients).
***: Location details of 58 patients were not available in the database.
n: Patient count; SD: standard deviation.
Due to their fragile nature, mucosal blisters are difficult to diagnose before skin lesions and may frequently be severe (33). The mechanisms underlying these autoimmune processes are frequently known, differential diagnoses are important to exclude a real benign or malignant tumor of the oral mucosa (29).

Lichen planus is a well-known mucocutaneous chronic inflammatory condition. Its primary etiology remains unknown, but it may be due to irritation of the oral mucosa (30,31). A recent metaanalysis from Greece reported that the incidence of oral lichen planus in the general population was 1.27% (32). Of our biopsied patients over 13 years, 1.71% had lichen planus or lichenoid reactions, with women being affected more frequently than men (58.3%) and the buccal/vestibular mucosa being the most common area (88.3%), findings similar to previous data from Turkey (20). The mean age of our patients with lichen planus (46.7 (15.4) years) was younger than that reported in other populations (20,33,34). The suggestion that oral lichen planus may be associated with hepatitis C infection in patients from Mediterranean countries was not supported by the results of controlled epidemiological studies. Genetic influences may affect the clinical manifestations of the disease. Oral lichen planus is considered a premalignant condition and more resistant to therapy than skin lesions (35).

Dermatoses accounted for only 1.1% of all mucosal lesions, with pemphigus vulgaris being the most common, followed by mucous membrane pemphigoid, lupus erythematosus, and bullous pemphigoid. The mechanisms underlying these autoimmune processes are unclear but oral lesions may be the initial presentation before skin lesions and may frequently be severe (33). Due to their fragile nature, mucosal blisters are difficult to biopsy, preventing a histopathological diagnosis. Direct immunofluorescence, using antibodies against specific immunoglobulin and complement components, is essential for differential diagnosis (4). Considering the female predominance of autoimmune diseases (4,33), we found similar rates as in the literature. The incidence of dermatoses among our biopsies was likely to be lower than expected due to dermatology consultations.

Pigmented lesions were relatively uncommon. They were observed only in 2.0% of our patients with a mean age of 49.9 years, similar to previous findings in a Turkish population (16). Although we observed a slight difference in incidence by sex (54.3% female), other studies have found a significant female predominance (3).

Although the types of mucosal lesions in our Turkish population were similar to those reported in studies from Europe and North America, we found that the mean age of patients with hyperplastic lesions was lower (46.8 years) compared to previous studies (25). Hyperplastic lesions most often occur in older adults, associated with denture-wearing. Many Turkish people start wearing dentures at younger ages due to tooth loss and poor oral hygiene.

In general, oral mucosal reactive lesions were more common during the fourth and fifth decades of life, with most reactive lesions observed in younger individuals (6,9,34), as in the present study (36.1 years). Lesions developing in response to chronic or acute trauma may be caused by mixed dentition, poor oral hygiene, dental restoration, and/or hormonal imbalance, all of which occur in a younger population.

Analyzing the oral lesions on the basis of location was important to point out the frequencies of lesions according to age and sex. It was noted in this study that mucosal lesions are not rare in either dental practice or oral pathology.

In conclusion, our findings revealed that hyperplastic lesions were the most common type among oral mucosal nonneoplastic lesions. Geographic and ethnic differences of patients with various types of oral mucosal lesions require further investigations.

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