

Prevalence of Pathological Lesions and Normal Variations in the Oral Mucosa among Geriatric Patients at the University Veracruzana

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Abstract: ***Objective:** To determine the prevalence of pathological lesions and variants of normalcy in the oral mucosa among geriatric patients who visited the University of Veracruz. **Materials and Methods:** A descriptive study was conducted by analyzing clinical records of 34 patients treated in two groups of the Geriatric Dentistry Educational Experience during the period from August to December 2024; To evaluate the association between variables (age, presence of chronic degenerative diseases, and sex), Fisher's exact test was used, with a statistical significance level of $p < 0.05$. **Results:** 32.4% had at least one pathological lesion, and 85.3% had at least one variant of normal. No statistically significant association was identified between the variables and the presence of lesions and/or variants. **Conclusions:** The study characterized the oral lesions present in the geriatric population. The findings highlight the importance of a systematic intraoral examination in geriatric dentistry.*

Keywords: Pathological lesions, oral mucosa, variants of normal, geriatric patient, geriatric dentistry

1. Introduction

In contemporary dental practice, the national demographic transition compels educational and healthcare systems to delve deeper into the study of oral aging. At the biological level, this transition induces changes in the oral mucosa, such as thinning of the epithelial tissue, xerostomia, and a propensity for oral varicose veins. Systemic and tissue changes increase the vulnerability of older adults to developing oral pathologies [1]. Although soft-tissue examination is part of the standardized clinical examination at university institutions, significant difficulties persist in clinical practice regarding the correct identification, documentation, and classification of these conditions. This problem stems from deficiencies in theoretical knowledge, inadequate oral examination techniques, or the morphological and clinical similarities among the lesions. The situation takes on critical importance when considering the socioeconomic background of patients who visit the Faculty of Dentistry's clinics, as they often find themselves in situations of economic vulnerability and lack the financial resources to access private dental services. Therefore, it is imperative that students in training develop the necessary competencies to provide a comprehensive and thorough examination capable of detecting any abnormalities in a timely manner.

International and national literature supports the urgency of this approach due to the high prevalence of these conditions. Sáez

et al. documented a direct correlation between systemic diseases- particularly diabetes mellitus- and the manifestation of oral pathologies, noting a higher prevalence among females [2]. Similarly, Meraz and Rodríguez, in a study conducted in Mexicali with a sample of 220 patients, reported an alarming average of more than four lesions per individual, demonstrating the high burden of oral morbidity in specific communities [3]. In the same vein, Donohué-Cornejo et al. examined 186 patients at the Department of Stomatology at the Autonomous University of Ciudad Juárez and found that only 7 subjects were free of any oral mucosal abnormalities. The latter author highlights a critical finding for public health: one-third of patients diagnosed with oral cancer are previously evaluated by at least three general dentists for various reasons before receiving a correct diagnosis, which highlights the serious gaps in routine soft-tissue examination [4].

In the local context, at the School of Dentistry, Xalapa Region, of the University of Veracruz, there is a direct precedent set by Soto, who, in his thesis titled "Oral Mucosal Lesions and/or Variations from the Normal in Patients Treated in the Educational Program in Geriatric Dentistry," determined that only 1% of the evaluated population was free of soft-tissue abnormalities [5]. Despite the existence of this valuable precedent, the present study is fully justified by the scientific need to generate up-to-date epidemiological information and establish a temporal comparison that allows for the evaluation

of the behavior of these conditions in the region. Given this context, the educational experience in geriatric dentistry is essential, as it equips university students with the skills for diagnosis, prognosis, and specialized treatment, serving as a crucial filter for the early detection of precancerous lesions, such as leukoplakia and erythroplakia [6].

The methodology for the semiological and stomatological description in this study is based on the classification of elementary lesions into:

1.1. Primary lesions, which appear on previously healthy mucosa and include the macule (a circumscribed, non-elevated discoloration <1 cm in diameter) [7] or a patch if >1 cm in diameter [8], the papule (an elevated lesion ≤ 1 cm in diameter) [7]-[9], the nodule (a firm, deep lesion > 1 cm) [9]-[12], the plaque (a solid, circumscribed elevation > 1 cm in diameter) [7], [8], [11], a neoplasm (may be malignant or benign) [9], a vesicle (serous fluid-filled blister ≤ 3 mm in diameter) [7], [9], a bulla (serous or bloody fluid-filled blister > 3 mm in diameter) [7], [8], [11], the pustule (superficial purulent collection) [7]-[9], the cyst (spherical lesion of firm or soft consistency covered by connective tissue)⁽¹³⁾ and the abscess (deep soft lesion with purulent contents) [9].

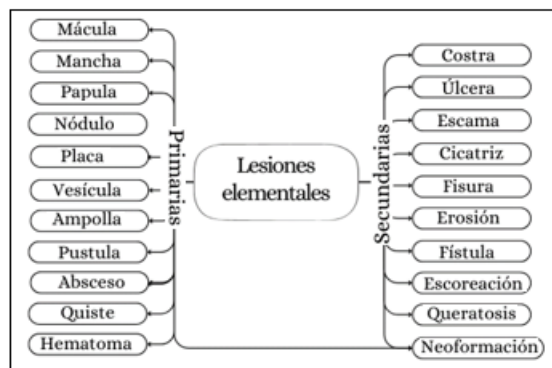


Figure 1: Elementary lesions: primary and secondary

Source: Author's own work.

1.2. Secondary lesions, on the other hand, develop on top of primary lesions [11] and include: the crust (drying of exudate) [7], [9], the ulcer (loss of continuity) [7], [9], scaling (block-like detachment of the stratum corneum) [10], [11], scar (fibrous connective tissue formed during repair) [10], [12], [14], fissure (loss of deep continuity) [9], erosion (loss of superficial continuity) [9], [12], fistula (a passage connecting a cavity to the outside), excoriation (superficial loss of continuity), and keratosis (thickening of the stratum corneum) [9].

Variants of normal are benign anatomical or histological changes that do not require therapeutic intervention. For the purposes of this study, only those identified in the evaluated sample were considered: Fordyce granules, the mucosal appendage of the vestibular frenulum, the oral melanotic macule, fissured tongue, coated tongue, geographic tongue, the linea alba or occlusal line, leukoderma, physiological pigmentation, exostosis, bony excrescences, and oral varicose veins.

The word “lesion” comes from the Latin “laesio” and “laesionis” and is defined as “physical damage or harm caused by a wound, blow, or disease” [15]. The following pathological lesions identified in the evaluated sample were included: traumatic ulcer, angular cheilitis, amalgam tattoo, erythematous oral lichen planus, fissured epulis, Candida-associated denture stomatitis, erythematous candidiasis, and pyogenic granuloma. Based on the above, the objective of this study was to determine the prevalence of pathological lesions and variants of normalcy in the oral mucosa among geriatric patients attending the Universidad Veracruzana.

2. Materials and Methods

This study is observational, descriptive, and retrospective. The study population consisted of all medical records of patients aged 65 years or older treated in the Geriatric Dentistry Educational Program from August through December 2024 at the School of Dentistry, Xalapa Campus, of the University of Veracruz; a geriatric patient was defined as any individual aged 65 years or older. The sample consisted of 34 medical records, corresponding to two groups within the educational program. Sampling was non-probabilistic and based on convenience. The patients' ages ranged from 65 to 91 years, with a mean of 72.7 years; the gender distribution was 19 women and 15 men.

The following criteria were applied for sample selection:

Inclusion criteria: patients of any sex, aged 65 years or older, who consented to the review and whose records contained a complete soft-tissue examination record.

Exclusion criteria: patients younger than 65 years of age and whose records did not contain a complete soft-tissue examination record. Analyses of periodontal disease and hard-tissue lesions (dental structures) were excluded.

The data were obtained from the soft-tissue examinations performed by the students on patients during dental care; the students had the training, theoretical knowledge, and clinical skills to identify any abnormalities. The records were subsequently reviewed and validated by the instructor overseeing the educational experience. The information obtained was entered into a matrix, and the data were anonymized by removing the patients' names to maintain their confidentiality and ensure an ethical analysis. The data were analyzed using descriptive statistics (to obtain absolute frequencies and percentages) and inferential statistics using Fisher's exact test (with a significance level of $p=0.05$).

2.1 Clinical Examination Protocol

Data collection was carried out through a systematic intraoral clinical examination under artificial light, using an intraoral mirror and sterile gauze. The examination of the soft tissues followed a strict anatomical sequence:

1) Vermilion border and lips: visual inspection and digital palpation to assess tone, hydration, and rule out swelling.

- 2) Oral commissures: evaluation with mouth opening to verify elasticity and moisture.
- 3) Oral mucosa (buccal): Perform a digital and visual examination in an oval pattern, starting in the posterior upper region of the right cheek and moving toward the anterior region, everting the lips to examine the labial mucosa, and continuing in the same manner toward the left side, ending in the posterior lower region on the right side
- 4) Frenula and gums: Pull the upper and lower lips to assess frenulum attachments and gum characteristics (marginal, attached, and alveolar mucosa).
- 5) Tongue and floor of the mouth: hold the tip of the tongue with gauze to examine the dorsum, lateral edges, and ventral surface, concluding with the floor of the mouth.
- 6) Palate: visual and digital inspection of the hard palate (raphe, incisive papilla, rugae) and soft palate.



Figure 2: Soft tissue examination. Source: Author's own work

Any abnormalities identified were compared with the diagnostic literature to rigorously classify them as pathological lesions or normal variants.

The study variables were divided into three categories:

- 1) The dependent variable, which corresponded to the presence of lesions and was classified as either pathological or a variant of normal.
- 2) Independent variables, which included age, chronic degenerative diseases, and sex.
- 3) Descriptive variables, which included lesion type and anatomical location.

The age variable was divided into two age ranges- 65 to 74 years and 75 years and older- to allow for descriptive analysis and to apply Fisher's exact test.

3. Results

Of the total 34 patients, 32 (94.1%) had at least one lesion, either pathological or a variant of normal (all male patients had lesions). Two patients (5.9%) had no lesions (both female). 11 patients (32.4%) had at least one pathological lesion. 29 patients (85.3%) had at least one variant of normal. 8 patients (23.5%) had both types of lesions (4 females and 4 males). The categories are not mutually exclusive; therefore, a patient could have more than one type of lesion.

The most common pathological lesions found in the sample were: traumatic ulcers, present in 4 patients (1 female and 3 males); angular cheilitis (in 2 females); and, finally, Candida-associated subprosthetic stomatitis, present in 2 patients (1 female and 1 male); the other lesions not mentioned were present in only 1 patient (Table 1).

Table 1: Most frequent pathological lesions in the sample

Lesion Patologica	Total (n)	%	Mujeres (n)	Edades Mujeres	Hombres (n)	Edades Hombres
Ulcera Traumática	4	11.8	1	91	3	65,70,82
Quelitis Angular	2	5.9	2	75,91	0	-
Estomatitis Protésica Asociada a candida	2	5.9	1	65	1	82

Source: Research results. Prepared by the authors.

Regarding variants of normality (Table 2), Fordyce granules were the most commonly observed, in 13 patients (4 females and 9 males); a coated tongue was present in 11 patients (4 females and 7 males); oral melanotic macules were present in 9 patients (5 females and 4 males), and finally, oral varices were also present in 9 patients (4 females and 5 males).

Table 2. Most frequent variants of normality in the sample

Variante de la normalidad	Total (n)	%	Mujeres (n)	Edades Mujeres	Hombres (n)	Edades Hombres
Granulos de Fordyce.	13	38.2	4	67,71,82,91	9	65,65,66, 67, 69, 72, 76, 79
Lengua saburral	11	32.4	4	66, 67, 73, 85	7	65,65,67, 72, 75, 78, 79
Macula Melanótica	9	26.5	5	66, 67, 78, 82, 85	4	65, 78, 79, 82
Varices Bucuales	9	26.5	4	71, 72, 78, 85	5	66, 69, 72, 76, 79

Source: Research results. Prepared by the authors.

3.1. Sample Characteristics

The age range of the patients was 65 to 91 years, with a mean of 72.7 years; the gender distribution was 19 women and 15 men. The 65–74 age group consisted of 21 patients, while the ≥75 age group included 13 patients.

Consistent with this, the majority of lesions—both pathological and variants of normal—were concentrated in the 65–74 age group.

Regarding the distribution of chronic degenerative diseases in the sample (Figure 1), of the 34 patients, 18 (i.e., 52%) had at least one chronic degenerative disease, with hypertension being the most common, followed by type II diabetes mellitus. (Tables 3 and 4).

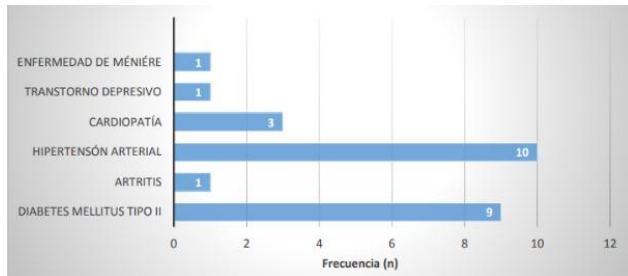


Figure 1: Distribution of chronic degenerative diseases among affected patients. (The same patient could have more than one disease.) Source: Research results. Prepared by the authors.

Table 3. Association between the presence of chronic degenerative diseases and pathological lesions

Enfermedad Crónico-degenerativa	Lesion no. patologica. Si.	Lesion patologica. No.	Total
Si	5	13	18
No.	6	10	16
Total	11	23	34

Source: Research results. Prepared by the authors

Table 4: Association between the presence of chronic degenerative diseases and variants of normal

Enfermedad Crónico-degenerativa	Lesion no. patologica. Si.	Lesion no. patologica. No.	Total
Si	15	3	18
No.	14	2	16
Total	29	5	34

Source: Research results. Prepared by the authors.

The results of the statistical analysis of the relationship between the dependent and independent variables using Fisher's exact test are shown below in Table 5.

Table 5: Statistical analysis of the association between variables

Variables	Result p-value
Age and Presence of Pathological Lesions	p=1.000
Age and presence of variants of normality	p=0.132
Presence of chronic degenerative diseases and presence of pathological lesions.	p=0.717
Presence of chronic degenerative diseases and presence of variants of normal.	p = 1.000
Patient gender and presence of pathological lesions.	p=1.000
Patient gender and presence of variants of normal.	p = 0.355

Source: Research results. Prepared by the authors.

The study sought to identify the anatomical sites of the oral mucosa where lesions occurred most frequently. Regarding pathological lesions (Table 6), these occurred most frequently at three sites: the buccal mucosa (14.7%), the gingiva (11.8%), and the hard palate (8.8%).

Table 6. Distribution of pathological lesions by anatomical site of the oral mucosa.

Sitio anatómico.	Frecuencia absoluta (n).	Frecuencia relativa (%).
Mucosa yugal.	5	14.7
Encia.	4	11.8
Paladar duro.	3	8.8
Comisuras labiales.	2	5.9

Source: Research results. Prepared by the authors.

Regarding variants of normality, the three sites where they were most frequently observed were the lingual dorsum (64.7%), the buccal mucosa (38.2%), and the gingiva (23.5%), Table 7.

Table 7: Distribution of variants of normalcy by anatomical site of the oral mucosa

Sitio Anatomico.	Frecuencia absoluta (n)	Frecuencia relativa (%)
Dorso lingual	22	64.7
Mucosa yugal	13	38.2
Encia.	8	23.5
Labio inferior.	7	20.6
Labio Superior.	6	17.6
Vientre Lingual	6	17.6
Comisuras Labiales	4	11.8
Bordes Laterales de la lengua	3	8.8
Piso de boca.	3	8.8
Borde bermellon	3	8.8
Paladar duro	1	2.9
Feenillo Labial Superior	1	2.9

Source: Research results. Prepared by the authors.

4. Discussion

Variations from normal were the most common finding, likely due to the physiological changes associated with aging. In contrast, the presence of pathological lesions was less common; however, these are clinically relevant because they may indicate chronic inflammatory processes or conditions requiring monitoring, especially in older adults. The most affected anatomical sites were areas exposed to greater local trauma. No statistically significant association was found between the dependent variable and the independent variables—which were sex, age, and chronic degenerative diseases. When compared with Soto⁵, similarities were found in the most frequent variants of normality in both studies, namely Fordyce granules and varicose veins. Among the study's strengths is the use of real clinical data and complete records. Among the limitations are the small sample size and the retrospective, y design, which does not allow for the establishment of causal relationships.

5. Conclusions

The study characterized the oral lesions present in the geriatric population, revealing a high frequency of abnormalities in areas subject to greater functional contact. Although no statistically significant association was found, the findings highlight the importance of a systematic intraoral examination in geriatric dentistry.

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