

## The most common oral lesions in edentulous patients with total prostheses.

Lesiones orales más frecuentes en pacientes edéntulos portadores de prótesis total.

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**Receipt:** 01/01/2019 **Revised:** 02/21/2019

**Acceptance:** 03/27/2019 **Online:** 12/27/2019

**Abstract:** A group of 210 patients with total maxillary and mandibular prostheses were examined to identify the main pathological alterations suffered by edentulous patients. The observed results determined that the average age at which the largest edentulous population is found is between 56 and 65 years with a higher prevalence of females. Of these more than 50% have used oral prostheses for more than 12 years with an adequate hygiene quality in 116 patients where the most frequent oral pathology associated with edentulism was fibrous hyperplasia (epulis), found in 19 patients, followed by stomatitis sub-prosthesis.

**Keywords:** *Maxilla; pathology, oral; mouth, edentulous; denture, complete; dental prosthesis; stomatitis.*

**Resumen:** Se examinó a 210 pacientes portadores de prótesis total maxilar y mandibular para identificar las principales alteraciones patológicas que padecen los pacientes edéntulos. Los resultados observados determinaron que el promedio de edad donde se encuentra la mayor población edéntula ocurre entre los 56 y 65 años con una prevalencia mayor en el género femenino, de estos más del 50% han empleado prótesis bucales por más de 12 años con una calidad en la higiene adecuada en 116 pacientes donde la patología bucal más frecuente asociada al edentulismo fue la hiperplasia fibrosa (épulis) en 19 de ellos seguida por la estomatitis subprótesis.

**Palabras Clave:** *Maxilar; patología bucal; boca edéntula; dentadura completa; prótesis dental; estomatitis.*

### INTRODUCTION.

Edentulism is a condition associated mostly with elderly people, having psychological and physical effects in the body of patients and may produce depression, anemia, malnutrition, isolation, among others, and poses a risk of suffering systemic diseases.

The group of edentulous people, from a dental point of view, has become a poorly considered or benefited group regarding oral health due to the lack of promotion and management of oral health care programs among older people, not aiding in the prevention of this condition that has high incidence rates.

The oral state is modifiable under certain characteristics and physical, chemical and biological properties so it can be variable or constant. In people with edentulous jaws, this is not an exception, and from this arises the need to

#### Cite as:

Ocampo K, Barrera J, Figueroa A & Salgado A. The most common oral lesions in edentulous patients with total prostheses.

J Oral Res 8(5):394-399.

Doi:10.17126/joralres.2019.061

carry out a study in which diagnostic criteria are established allowing the oral conditions of edentulous patients to be known in order to offer both better diagnostic and prognostic services, as well as a successful treatment plan for this population with such specific needs and qualities. The stomatognathic system is a perfectly defined, functional, physiological entity composed of a set of organs and tissues, but whose biology and pathophysiology are absolutely independent.<sup>1</sup>

The maxillary alveolar processes, the zygomatic processes and the palatine processes are the bone structures most directly related to prosthesis support in an edentulous patient, and which are closely related to the muscles, the temporomandibular joint and the vasculonervous bundle, in such a way that the innervation of the arches and teeth derives from the maxillary and mandibular branches of the fifth cranial nerve or trigeminal nerve.<sup>2</sup>

The oral cavity is covered with a mucous membrane that varies from one region to another, the epithelium that covers it is of stratified squamous type and presents great structural differences with development, which are related to the functions of a determined zone and with the biophysical influences on the tissues. This mucous joins the underlying structures by means of the submucous conjunctive tissue layer. The epithelium constitutes a tissue with intense mitotic activity, responding to a cellular adaptation against the action of chronic aggressors of low intensity.<sup>3</sup>

When, due to certain alterations or factors within this system, loss of teeth occurs, different consequences arise, such as the reabsorption of the alveolar bone and lesions in the temporomandibular joint (mainly due to the loss of the vertical dimension) with subsequent phonetic, aesthetic, chewing and digestive alterations due to the fact that the patient is forced to new a new diet characterized by a greater consumption of soft foods that are easy to chew.<sup>4</sup>

Another aspect to consider in edentulous patients is saliva. Although there are no specific studies that have determined the amount of saliva produced by edentulous patients the alterations derived from the salivary glands cause, among other pathologies, xerostomia, which is a subjective oral disorder known as dry mouth. It presents typical symptoms such as difficulty in eating dry food,

swallowing, speaking, retaining prostheses, gustatory alterations, burning sensation in mucous membranes, recurrent trauma and ulcerations, and propensity to infections.<sup>5,6,7</sup>

Total salivary flow in a healthy person is 500ml to 600ml/24 hours, key for the maintenance and integrity of the mucous membranes due to the fact that mucins have rheological properties such as low solubility, high viscosity, elasticity and adhesiveness. It is also capable of retaining water so its presence on mucous surfaces serves as a moisturizer and has a buffering property that neutralizes the pH of the oral cavity, and has antimicrobial, antifungal and antiviral action.<sup>8,5,9</sup>

The placement of prosthetic devices in the oral cavity provides an additional habitat for microbial adhesion and colonization, transforming it into an anaerobic environment and creating in the edentulous patient a microbiological imbalance exacerbated by advanced age. Further, the oral mucosa under the base of the prosthesis coupled with insufficient oral hygiene, lead to the growth of *lactobacilli*, *streptococci*, *Prevotella spp.*, *Veionella spp.* and *Candida albicans*.<sup>8</sup>

The most reported oral pathologies in edentulous patients include the following:

Leukoplakia, a term coined by Schwimmer in 1877 that means "white plaque". It can refer to lesions ranging from inflammatory, infectious or reactive processes to neoplasms. It is the most frequent premalignant lesion. The histological substrate consists of epithelial hyperplasia with or without atypia and surface hyperkeratosis. It occurs at any age, mostly in people over 30 years old, with a peak around 55, and a male to female ratio of 2:1 affecting 1-5% of the population.

The treatment is to eliminate the etiological factor and remove the lesion by surgery, electrocoagulation, cryosurgery and laser vaporization.<sup>10,11</sup> It can be classified as homogenous leukoplakia, with clearly pronounced borders, uniform, flat or wrinkled surface; And non-homogenous leukoplakia, with irregular surfaces, occasionally symptomatic, it presents a higher risk of malignancy and includes variants such as leukoerythroplasia.<sup>11</sup>

Epulis, a chronic inflammatory tumour, granulomatous, on the gum and dependent on the periosteum or periodontium. These are usually classified in the

group of benign tumours of the buccal mucosa. There are three large groups based on histopathological criteria: granulomatous, fibromatous and giant cell. Some authors prefer to use the term hyperplasia rather than epulis, since the latter only designates the topographic location of the lesion, whereas hyperplasia is an increase in the number of cells in an organ or tissue. The treatment of these lesions is aimed at the elimination of the etiological agents and surgical removal.<sup>10</sup>

Dentured related stomatitis is the inflammation of the mucosa supporting the prosthesis. It is related to the buccal ulcer and angular cheilitis, this combination results in a velvety or very ripe strawberry appearance as well as cracking of the commissure, is accompanied by pain and burning. It has a prevalence of 25 to 65% and a higher frequency in females. There are three variants based on the clinical appearance of inflammation: Type I, with erythematous points or localized hyperemic areas; Type II, with hyperemic diffuse zone in the supporting tissues of the prosthesis; Type III, characterized by papillomatous lesions.<sup>12-14</sup>

Erythroplakia is a velvety erythematous lesion that appears isolated in buccal mucosa, a red plaque that may have white areas. Usually, this lesion involves palate, floor of the mouth or tongue.<sup>15</sup> These are considered preneoplastic lesions, which may appear in patients with prostheses, both in the hard palate and in the soft palate.<sup>16,17</sup>

There are three groups: homogeneous erythroplakia, reddish in color and more circumscribed and delimited than the other groups; speckled erythroplakia, with raised areas; and erythroleukoplakia, characterized by flat, smooth and alternating reddish and whitish lesions.<sup>16</sup>

Hemangiomas are benign tumors composed of blood vessels and endothelial cells characterized by a natural history of growth and regression.<sup>18</sup> The most common locations of dental hemangioma in the buccofacial area are the lips, tongue, buccal mucosa, palate, and gums, which are usually elevated, red, blue, or purple. For differential diagnosis, pressure can be applied on the lesion, producing a slight ischemia. Occasionally, dental hemangiomas may cause bleeding favored by constant trauma due to close proximity to teeth or dentures.<sup>9,15</sup>

Candidiasis, an opportunistic fungal infectious disease affecting skin and mucosa caused by the *Candida* yeast.

Fungus belonging to this genus are present in 40 to 60% of prostheses and are usually located in the mucosa of the palate below the surface of the upper prosthesis.

#### There are two types of candidiasis:

Pseudomembranous, present in hosts with local or systemic immunodeficiency, or who use of corticosteroids; and erythematous, present mainly in patients with an acrylic-based muco-supported prosthesis, frequently in the palatal vault.<sup>15</sup> The aim of this study, and based on the identified conditions in edentulous patients, is to find a reference that allows to identify and prevent any of the oral pathologies in patients with edentulous maxilla, so as to provide a timely and accurate treatment, having as main interest the general health of the patient and, at the same time, the prevention of other oral health alterations.

## MATERIALS AND METHODS.

An observational, descriptive, cross-sectional and retrospective cohort study was conducted. Nonprobability-based sampling using convenience and sequential techniques was performed on 210 patients attending the Total Prosthesis Clinic of the School of Dentistry of the Universidad Autónoma del Estado de México. Variables included age, gender, length of use of the prosthesis, hygiene, and presence of oral lesions.

The objective is to evaluate the relationship between good or poor oral hygiene and the development of oral lesions in edentulous patients with total prosthesis. Subsequently, a descriptive statistics analysis was carried out, establishing a database to carry out descriptive and inferential statistics.

## RESULTS.

The average age of the largest edentulous population is between ages 56 to 65 accounting for 50% of cases, followed by the age range of 66 to 75 (24%), and 46 to 55 (17%) Table 1. In terms of gender, it was found that 52% of the edentulous patients were female, and 48% were male (109 women; 101 men). Of all edentulous patients examined, 36% had used their prosthesis for more than 16 years, 29% for a period from 1 to 5 years, 16% for a period from 6 to 10 years, 11% for less than six months and 8% from 11 to 15 years.

Regarding the hygiene status of the prosthesis, it was found that only 55% (116 patients) carried out an

adequate oral hygiene. Regarding oral injuries, 68% (143) of the patients did not present any injury. From the remaining 32% (67 patients) who had oral lesions, 54% had subprotesic stomatitis, 28% had epulis, 11% had candidiasis, 9% presented leukoplakia, 6% erythroplakia and 3% had hemangioma (Figure 1).

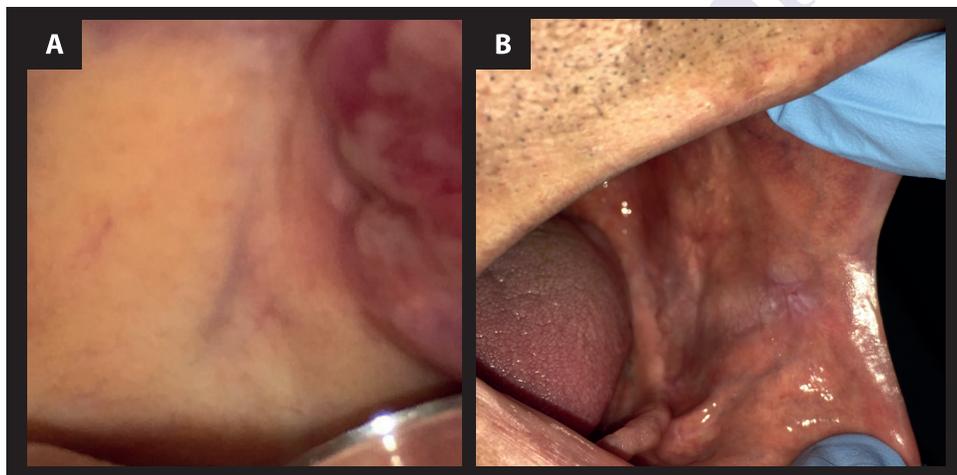
A combination of erythroplasia and leukoplakia was found in one patient (Table 2). In relation to buccal pathologies, it was found that 80% of the population does not present symptoms or signs. In relation to the remaining 20%, 40% of those affected recognize among their symptoms pain, 30% ulcers and 10% bleeding and

inflammation. Halitosis was associated with oral lesions in 100% of patients. (Table 3)

Inferential analysis of the data resulted in an odds ratio OR=1.42, so it is 1.42 times more probable for edentulous patients wearing total prostheses to suffer from an oral lesion when there is a poor hygiene.

Based on the odds ratio, we can state that people with good oral hygiene are 3 times more likely to not present an oral lesion (OR  $p=2.88$ ). With a 95% confidence interval (CI), we can state that there is not any statistically significant risk of developing an oral lesion when there is good oral hygiene (95% CI =2.7 to 3.3).

Figure 1. Types of lesions.



A: Male patient with leukoplakic lesion in cheeks on both sides. B: Male patient has erythroplastic lesion on the palate of the right side.

Table 1. Age of edentulous patients.

AGE range	PATIENTS (n)
Under 35 years	3
36-45 years	6
46-55 years	35
56-65 years	106
66-75 years	51
76 years and over	9

Table 2. Presence of oral lesions in patients with total prostheses.

Type of lesion	n	%
Subprotesic stomatitis	28	54
Leukoplakia	6	9
Haemangomia	2	3
Epulis	19	28
Erythroplasia	4	6
Candidiasis	8	11
<b>total</b>	<b>67</b>	<b>100</b>

**Table 3.** Presence of oral lesions in relation to oral hygiene.

Hygiene of patients with total prostheses	Presence of oral lesions		Total
	Presence	Absence	
Good	41	75	116
Poor	26	68	94
Total	67	143	210

## DISCUSSION.

The use of dentures changes the oral environment into an anaerobic environment, which predisposes people to infections and changes in their salivary pH with the subsequent presence of oral lesions. In the present study we observed oral lesions such as epulis in 19 patients and candidiasis in 11%.<sup>19,5</sup>

Likewise, we confirm a connection between the use of prostheses and the presence of oral lesions. More patients (68 % or 143) did not present any lesion, while the remaining 32% (67) of the patients did, taking into account the definition of buccal lesions set by Burnett and Nolte, who indicate that it includes all that self-limited lesions caused by a stimulus or irritation that tends to disappear after the excision or elimination of the etiological factor. The lack of oral hygiene is linked to the appearance of oral lesions and their respective implications. In our research, we found that out of the 210 patients reviewed only 55% had adequate oral hygiene, while it was inadequate in 94 patients, which leads to a decrease in their quality of life and a greater predisposition to oral lesions.<sup>20</sup>

The quality of life of a person who presents edentulism and an associated oral lesion is clearly diminished, thus predisposing their health to deterioration leading to systemic disease. Therefore, it is very important to recognize the oral pathologies most commonly associated with edentulous patients who wear prostheses in order to develop protective factors and timely treatment.<sup>3</sup> We found that the average age of edentulous patients ranges from 56 to 65 years, appearing this condition is more frequent in early elderly patients. This is in agreement with studies indicating that with aging the muscles of mastication present changes that lead to a decrease in the bite force, predisposing patients to teeth loss. Likewise, we also found that females are most likely to suffer from edentulism over males, with 52% and 48% respectively.

The aim of this study was to determine the oral lesions mostly associated with the use of total prosthesis in edentulous patients. We found that the most frequent oral lesion in the edentulous patient wearing prosthesis was fibrous hyperplasia or epulis, which is intimately related to prosthetic trauma as an etiological factor. It is also important to address the issue of salivary flow, since up to 25% of the elderly patients claim to have xerostomia, which indicates that the salivary flow of edentulous patients is mostly diminished, thus causing hyposalivation and a constant dryness that favors the proliferation of bacteria, in addition to the appearance of pathological irritating factors in the patient's oral mucosa. The elderly generally make multiple movements of the tongue and hyoid bone before swallowing. For this reason, it can be concluded that age has a close relationship with xerostomia, and it is in old age that this tends to be experienced, as there is a decrease in salivary flow, a situation that hinders mastication, digestion and even speech.

It is observed a masticatory-parotid salivary reflex in edentulous patients who do not have periodontal receptors. In this case, afferent nerve endings in the mucosa beneath the oral prostheses could take over this function to maintain the salivary reflex, since fully mucosupported prostheses are the typical "complete dentures". The importance in rehabilitation of the total prosthesis lies in recovering the functions of the mouth, which include effective mastication and not having the prosthesis interfering with swallowing, since both functions directly influence feeding, and adequate phonetics that allows the patient to communicate correctly without the interference from the prosthesis.

However, the anatomical gum recession is an obstacle for edentulous patients to recover the functions of the mouth. The majority of patients in our sample have used the same set of dentures for more than 16 years illustrating

a relatively adequate hygiene; however, others present alterations in the mucosa related to the sub-prosthesis stomatitis such as pain or ulcer by the continuous, permanent and excessive use of the same set of dentures on the alveolar processes; or, there is presence of epulis, which does not indicate the existence of pathologies of great impact. The main concern is treat and prevent periodontal disease, since they are one of the main causes of tooth loss, evidenced in their different pathologies such as gingivitis and periodontitis, which affect the marginal gum and the adhered gum, since they destroy the fibrous insertion of the periodontal fiber.

## CONCLUSION.

About a third of examined patients presented at least one oral pathology. The most frequent oral pathologies associated with edentulism was subprotesic stomatitis (54%), followed by epulis (28%) and candidiasis (11%). A combination of erythroplasia and leukoplakia was found in one patient.

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**Conflict of interests:** No potential conflict of interest reported by the authors.

**Ethics approval:** This study approved the Research Ethics Committee of the State Cancer Center (Centro Oncológico Estatal ISSEMYM) is: COE-CEI-PT-05-2019

**Funding:** None.

**Author's contribution:** Ocampo, Barrera: preparation of study protocol, surgical intervention of lesions and obtention of Ethics Approval. Figueroa: article writing. Salgado: bibliographic review.

**Acknowledgements:** This study was supported by the ISSEMYM State Cancer Center.