Benign tumors of the oral mucosa: A study of 300 patients

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Abstract

Objectives: To analyze the frequency and type of the most common benign tumors of the oral mucosa found at the Hospital Stomatology Service, and to study the clinical characteristics and possible etiological factors.

Material and Methods: This is a retrospective study of 300 patients with histologically diagnosed benign tumors of the oral mucosa. Data was compiled for each case, documenting information relating to age, gender, medication, habits (smoking, oral hygiene), anamnesis (reason for consultation, symptomatology, evolution), and the characteristics of the lesion (site, color, size, surface, consistency, and base).

Results: Of all the tumors studied, 53% were histologically diagnosed as fibroma. In the study of prevalence of benign tumors of the oral mucosa, no differences were found for age; however there were differences according to gender, finding a greater prevalence of fibromas, pyogenic granulomas, and giant cell granulomas in women, at a ratio of 2:1. The group of tumors studied showed a significantly asymptomatic behaviour, and self-limiting and slow growth. With respect to the possible etiologic agents, we found no statistically significant differences between them.

Conclusions: Following the study of 300 patients histologically diagnosed with benign tumor of the oral mucosa, we can state that with regard to prevalence, we found significant differences with respect to gender, being more frequent in women. The fibroma is the most frequent benign tumor of the oral cavity.

Key words: *Benign tumors, oral.*

Introduction

Benign tumors of the oral mucosa, as with any other location, present certain common characteristics. They are generally of slow, progressive and limited growth. They are not invasive, and are histologically benign, with scant mitosis and high cellular differentiation. Recurrence is rare, and they never produce metastasis. They have no effect on the general state of health. (1)

In general, the majority of these tumors have no significant repercussion on the life of the patient, having an anodyne and negligible clinical effect. Their frequency is highly variable, some being extremely rare, while others are a common finding in daily practice. (1, 2)

Many classifications have been proposed; the majority of these based on the tissue from which they originate. (2)

The objectives we proposed at the beginning of our investigation were the following: to determine the prevalence of benign tumors of the oral mucosa observed in patients who attended the Stomatology Service of the General University Hospital, Valencia, between the years 2000 and 2005. Simultaneously, to analyze the existence of etiological factors relating to the development of benign tumors of the oral mucosa, and to describe the defining clinical characteristics for each of the different types.

Material and Methods

A retrospective study was carried out at the Stomatology Service of the General University Hospital, Valencia, between the years 2000 and 2005, selecting cases diagnosed as benign tumors of the oral mucosa, including the following

types: fibroma, papilloma, pyogenic granuloma, giant cell granuloma, lipoma, hemangioma, lymphangioma.

The clinical records were reviewed of 300 patients with diagnosis histologically confirmed by the Pathology Department of the University General Hospital, Valencia.

Data was recorded regarding age, gender, and pregnancy (in women); it was also noted if the patients were taking any medication, classifying them as antihypertensives, antiepileptics, antidepressants, hormonal treatments and others.

The existence of relevant habits was then studied, evaluating smoking and oral hygiene.

• For smoking, it was first established if the patient was a smoker or not, and when affirmative, the type and quantity of tobacco smoked per day (0-10 cig/day, 11-20 cig/day, >20 cig/day, cigar or pipe).

• The level of oral hygiene was established as a function of daily brushing, evaluated as good if the patient brushed 3 or more times per day, moderate if brushing was once or twice a day, and poor if brushing was infrequent or null.

Subsequently, the anamnesis for the patient was reviewed, recording:

• The reason for the consultation: established as either an incidental (asymptomatic) or symptomatic finding.

• Patient symptomatology: within the principal symptoms, it was determined if the patient was asymptomatic, or if they presented some form of nonspecific discomfort, pain or bleeding (differentiating between spontaneous and stimulated bleeding).

• The evolution of the lesion

• The anatomical site and the type of lesion were also described.

Any recent dental extractions in proximity to the lesion were verified, also if the patient was wearing any prosthesis or orthodontia that may injure or irritate the area around the lesion.

With respect to the characteristics of the lesion, the colour (red, white, normal, blue, and yellow), the surface (smooth or ulcerated), the consistency (soft, elastic or firm) and the base (sessile or pedunculated) were indicated. The size of the lesion was measured in millimeters.

All results were analyzed using the SPSS 12.0 statistical package, evaluating aspects of descriptive statistics; and also using the Student's t test to determine significant differences between the means of two groups. In the case of more than two groups, a ONEWAY variance analysis was employed. To evaluate association or independence between qualitative variables the $\chi 2$ test was used. Significance was considered for values of $p<0.05$.

Results

Following the histological study of the lesions, of the 300 benign tumors studied, 160 (53.3%) were diagnosed as fibroma, 40 (13.3%) papilloma, 20 (6.7%) peripheral giant cell granuloma, 44 (14.7%) pyogenic granuloma, 9 (3%) lipoma, 24 (8%) hemangioma and 3 (1%) lymphangioma. The characteristics of the studied tumors are detailed in Table 1.

Of the 300 patients studied, the mean age was 50.5 years, range 2 to 89, with a standard deviation of 18.67, and a standard error of 1.07. On comparing the mean age of the patients for the different types of benign tumors, we find a similar mean age between the types, the highest being for lipoma and the lowest for papilloma, but with no significant differences between them. Of the total, 190 (63.3%) were female, and 110 (36.7%) male. The mean age of the women was 52.01, while the mean age for the men was 47.90. On evaluating the existence of association or independence between gender and histological diagnosis, we observed the same prevalence (1:1) in the case of papilloma, lipoma and hemangioma; while, on the other hand, we found a higher prevalence among females in the case of fibroma, pyogenic granuloma and giant cell granuloma, although with no significant differences. ($\chi 2 = 11.50$ and $p = 0.07$).

Regarding medication, it was found that of the 300 patients, 144 (48%) were taking some form of medication, while 156 (52%) were not. Of those taking medication, 68 (22.7%) were taking antihypertensives, 6 (2%) antiepileptics, 23 (7.7%) hormone treatment, 33 (11%) antidepressants and 14 (4.7%) others. On comparing the different tumors with the medications taken, we found no significant differences between them. (p=0.07%).

On studying the most common habits, we found that 81 patients (27%) were smokers, while 219 (73%) were not. Of the smokers, 22 (7.3%) smoked between 1 and 10 cigarettes per day, 20 (6.7%) 11-20 cigarettes/day, 35 (11.7%) more than 20 cigarettes/day, 3 (1%) smoked cigars, and 1 (0.3%) smoked a pipe. From the study of smoking we can see an increase in the prevalence of papilloma type benign tumors in smokers (62.5%), a large number of these smoking more than 20 cigarettes per day (40%). Significant statistical differences were found with respect to the other types of benign tumors with $\chi 2 = 47.39$ and $p<0.01$.

With respect to oral hygiene, we observe that 29 patients (9.7%) had good oral hygiene, 152 (50.7%) moderate oral hygiene, and 119 (39.7%) poor oral hygiene. A higher number of patients with no or infrequent brushing was seen in cases of papilloma, pyogenic granuloma, and giant cell granuloma, without finding significant differences. ($p>0.05$).

Of the patients studied, 287 (95.7%) did not refer any recent extraction in areas close to the lesion, while 13 (4.3%) did, coinciding with the group of patients with pyogenic granuloma and giant cell granuloma, finding statistically significant differences with the remainder of the tumors, with values $\chi 2=20.02$ and $p=0.01$.

Regarding local irritants in relation to the lesion, we can state that 64 (21.3%) were wearing irritating dentures in the area of the lesion, while 236 (78.7%) were not. Likewise,

Table 1. Descriptive and analytical results. Study of 300 patients.

		Fibroma	Papilloma	G-cell G	Pyogenic G	Lipoma	Hemangioma	Lymphangioma
Nº of cases		160 (53.3%)	40 (13.3%)	20 (6.7%)	44 (14.7%)	9 (3%)	24 (8%)	3 (1%)
Mean age (years)		50.46±18.05	46.85±16.63	54.85±17.80	46.95±22.91	62.33±12.77	54.33±17.94	58.00±24.25
Sex	*Male*	55 (34.4%)	19 (47.5%)	4 (20%)	14 (31.8%)	5 (55.6%)	13 (54.2%)	-
	Female	105 (65.6%)	21 (52.5%)	16 (80%)	30 (68.2%)	4 (44.4%)	11 (45.8%)	3 (100%)
Smoking	*1-10 cig/day*	12 (7.5%)	6 (15%)	-	4 (9%)	-	-	-
	11-20cig/day	9 (5.6%)	8 (20%)	-	3 (6.8%)	-	-	-
	>20 cig/day	20 (12.5%)	10 (25%)	1 (5%)	1 (2.3%)	1 (11.1%)	2 (8.3%)	-
Oral hygiene	*Null*	54 (33.7%)	15 (37.5%)	13 (65%)	21 (47.7%)	3 (33.3%)	12 (50%)	1 (33.3%)
	Moderate	87 (54.4%)	23 (57.5%)	5 (25%)	20 (45.4%)	5 (55.5%)	10 (41.6%)	2 (66.7%)
	Good	19 (11.9%)	2 (5%)	2 (10%)	3 (6.8%)	1 (11.1%)	2 (8.3%)	-
Exodontias		2 (1.2%)	2 (5%)	3 (15%)	6 (13.6%)	-	-	-
Prothesis		41 (25.6%)	6 (15%)	7 (35%)	5 (11.4%)	1 (11.1%)	4 (16.6%)	-
Orthodontia		2 (1.2%)	-	-	2 (4.5%)	-	-	-
Bleeding	*Spontaneous*	2 (1.2%)	-	1 (5%)	5 (11.4%)	-	2 (8.3%)	-
	Stimulated	8 (5%)	-	5 (25%)	13 (29.5%)	-	6 (25%)	-
Evolution (months)		19.77±26.34	12.74±18.80	12.59±18.68	6.65±10.75	41.67±40.68	18.75±23.05	35.33±27.30
Site	*Gingiva*	38 (23.8%)	4 (10%)	19 (95%)	34 (77.3%)	-	4 (6.7%)	1 (33.3%)
	Tongue	25 (15.6%)	16 (40%)	-	7 (15.9%)	2 (22.2%)	9 (37.5%)	-
	Buccal Mucosa	50 (31.3%)	2 (5%)	-	1 (2.3%)	3 (33.3%)	3 (12.5%)	2 (66.7%)
	Palate	15 (9.4%)	14 (35%)	1 (5%)	3 (6.8%)	1 (11.1%)	5 (20.8%)	-
	Floor of mouth	3 (1.9%)	2 (2.5%)	-	-	3 (11.1%)	-	-
	Commissure	14 (8.8%)	1 (2.5%)	-	-	1 (11.1%)	-	-
Size (mm)		7.70±5.18	6.98±4.87	13.30±8.17	10.53±6.52	19.78±9.77	12.04±7.67	8.33±5.77
Colour	*Red*	12 (7.5%)	3 (7.5%)	13 (65%)	31 (70.5%)	-	8 (33.3%)	2 (66.7%)
	White	9 (5.6%)	26 (65%)	-	1 (2.3%)	-	2 (8.3%)	-
	Normal	142 (88.8%)	13 (32.5%)	6 (30%)	13 (29.5%)	5 (55.6%)	2 (8.3%)	-
	Blue	1 (0.6%)	-	3 (15%)	2 (2.3%)	-	16 (70.8%)	2 (66.7%)
	Yellow	1 (0.6%)	-	-	-	3 (33.3%)	-	-
Surface	*Smooth*	123 (77.8%)	2 (5%)	4 (21.1%)	25 (58.1%)	9 (100%)	16 (72.7%)	1 (33.3%)
	Irregular	35 (22.2%)	38 (95%)	15 (78.9%)	18 (41.9%)	-	6 (27.3%)	2 (66.7%)
Consistency	*Soft*	57 (35.6%)	12 (30%)	9 (45%)	12 (27.2%)	6 (66.7%)	13 (54.2%)	1 (33.3%)
	Elastic	99 (61.9%)	28 (70%)	10 (50%)	30 (68.2%)	3 (33.3%)	9 (37.5%)	2 (66.7%)
	Firm	4 (2.5%)	-	1 (5%)	2 (4.5%)	-	2 (8.3%)	-
Base	*Sessile*	109 (68.6%)	11 (27.5%)	5 (25%)	20 (47.6%)	8 (88.9%)	22 (91.7%)	3 (100%)
	Pedunculated	50 (31.4%)	29 (72.5%)	15 (75%)	22 (52.4%)	1 (11.1%)	2 (8.3%)	-

(G- Cell G: Giant cell granuloma; Pyogenic G: Pyogenic Granuloma)

of all the patients, 4 (1.3%) were undergoing orthodontic treatment, while 296 (98.7%) were not. On studying these factors, and although no significant differences were found, we observed a high number of patients with ill-fitting dentures in relation to fibroma type benign tumors. The majority of these being epulis fissuratum related with the prosthesis.

On evaluating the principal signs, we observed that of the 300 patients registered, 17 (5.7%) were incidental diagnoses, while 283 (94.3%) had signs such as swelling and/or bleeding. When we studied the symptomatology of the different tumors, it was observed that practically none of the tumors were painful, finding statistically significant differences on comparing the variables. In this case the $\chi 2$ value was 17.80 and $p<0.01$.

In 42 (14.84%) cases, bleeding of the lesion was evident, observing that 10 (3.53%) patients presented spontaneous bleeding, and 32 (11.30%) bled on probing. With respect to spontaneous or stimulated bleeding, we see that the fibroma, papilloma, lipoma, and lymphangioma, did not bleed, while we observed that among the cases of giant cell granuloma, pyogenic granuloma and hemangioma, there was a considerable number which bled, generally provoked by local trauma ($\chi 2=55.48$ and $p<0.01$).

When studying the evolution of the lesions, we found that the mean time from the appearance of the lesion until the patient was diagnosed was 17.29 months, with a range between 1 and 120 months, standard error 1.46, and standard deviation 24.41. When comparing the evolution of the different benign tumors, we found that this was longer in the case of lipomas, and shorter in the case of pyogenic granuloma ($p<0.01$).

Regarding the location of the lesions, we observed that the most frequent site was the gingiva 100 (33.3%), followed by the buccal mucosa 61 (20.3%), back of the tongue 50 (16.7%), palate 39 (13%), lips 35 (11.7%), labial commissures 16 (5.3%), lower surface of the tongue 9 (3%) and floor of the mouth 8 (2.7%).

On studying the different sites, with respect to the gingiva we discovered a higher prevalence of pyogenic granuloma and giant cell granuloma at this site. At the back of the tongue we obtained a higher prevalence of papilloma type benign tumors. On the lower surface of the tongue, as at the back, the papilloma was again the most frequent benign tumor, accompanied by the hemangioma. On the lips, the most frequent tumors were hemangiomas and lymphangiomas. On the buccal mucosa, there was a greater prevalence of lymphangioma, fibroma and lipoma type benign tumors. On the palate, the most frequent tumor was the papilloma. On the floor of the mouth the lipoma was the most commonly found tumor, and the tumors that developed most at the commissures were the lipoma and fibroma. Statistically significant differences were found for all the locations, with a p value of <0.01.

It was observed that the mean size of the lesions was 9.1 mm with a minimum value of 2 and a maximum value of 40 mm, and a standard deviation of 6.47. On studying the means size of the different benign tumors we find that the largest were the lipomas, while on the other hand, the smallest, at the time of diagnosis, were the fibromas and papillomas.

On studying the principal colour of the lesions we observed that 181 (60.3%) presented a similar colour to the normal mucosa, 69 (23%) were of a reddish colour, 38 (12.7%) were whitish in colour, 24 (8%) were blue, while only four (1.3%) were yellow. On studying the predominant colour of the different tumors, we observed that the pyogenic granulomas, giant cell granulomas and lymphangiomas, had a greater predilection for the colour red. However the papillomas were more frequently white. The majority of the fibromas on the other hand opted for a similar colour to that of the normal mucosa. Violent or blue occurred more frequently in the lymphangioma and hemangioma type tumors due to their large vascular component. Yellow on the contrary was the least seen and found only in the lipoma type tumors due to their large adipose content. In all cases statistically significant differences were found with $p< 0.01$.

When studying the clinical characteristics of the lesions we find a smooth surface in 186 (62%), while 114 (38%) were ulcerated. When we analyzed the surface of the lesion we observed that the majority of fibromas, lipomas and hemangiomas had a smooth surface, while the papillomas, giant cell granulomas and lymphangiomas presented an ulcerated surface, with statistically significant differences between them, $\chi 2=92.65$ and $p<0.01$.

On studying the consistency on palpation we observe that 109 (36.3%) were soft, 181 (60.3%) were elastic, while 10 (3.3%) were firm. On evaluating the consistency of the lesion, and although no significant differences were found, we can state that the fibroma, papilloma, pyogenic granuloma and lymphangioma tumor types show a mainly elastic consistency, while only the lipomas and hemangiomas were found to be soft.

Regarding the base of the lesion, we observe that 179 (59.7%) presented a sessile base, while 121 (40.3%) were pedunculated. Statistically significant differences were found with respect to the base ($p<0.01$), finding that the majority of papilloma, pyogenic granuloma, and giant cell granuloma had a pedunculated base, while on the other hand, the remainder generally presented a sessile base.

Discussion

The majority of authors find no relationship between gender and prevalence of benign tumors, except in the case of pyogenic granuloma, which is more frequent in females 2:1 (3-6). In our study, this predilection for the female sex was not only observed in pyogenic granuloma but we also found a proportion of 2:1 for women in the case of other lesions such as giant cell granuloma and

fibroma, in agreement with Tamashiro et al. (7) who also found a predilection for females in fibromas.

In our study the mean age of the patients was 50.5 years ± 18.67 years, coinciding with many authors who indicate that these tumors can be found at any age, but that the majority of the patients are adults between 30 and 50 years old (8-11).

On analyzing patients' habits, we evaluated smoking and all hygiene. With respect to smoking no relationship between smoking and a higher prevalence of lesions was found, while on studying hygiene we observed a higher prevalence of pyogenic granuloma and giant cell granuloma in patients with inadequate or null oral hygiene. Some authors also relate poor hygiene with the appearance of these two clinical forms, not directly as a causal agent but favouring progression (6, 12, 13).

We respect to lesions and related trauma, we can say that according to the literature there is a direct relationship between the presence of local irritation and trauma and the prevalence of fibroma type lesions (2, 14, 15), giant cell granuloma (12, 13, 16) and pyogenic granuloma (17, 18). In our study we find a relationship between patients wearing irritant prostheses and these three lesions, the most frequent being the epulis fissuratum.

Since we are considering benign lesions, the symptomatology of these lesions is very slight or infrequent. Evaluating the principal symptomatology we observed that of the 300 patients studied, 3 presented pain and 67 demonstrated nonspecific discomfort generally associated with local irritation. Only when studying bleeding do we observe that a third of the tumors of vascular origin produce spontaneous or stimulated bleeding on the majority of occasions (2, 12, 19).

Likewise, these lesions adopt an absolutely benign behaviour, with an asymptomatic and self-limiting slow growth; the period of evolution can be highly variable. On studying the evolution of these lesions we find that the mean time from the appearance of the lesion to when the patient was diagnosed was 17.29 months, with a range between 1 and 120 months. Mallo et al. (20) in their study, indicate that the benign behaviour of these lesions is such that it is difficult for the patient to establish the point when the lesion first appeared, many diagnoses being incidental to routine dental check-ups, as expressed by Sapp et al., in their study (3).

Regarding location, we know that each type has certain predilection for different areas of the oral mucosa. In our study, and in agreement with many authors, we find that the most frequent location for fibromas was the buccal mucosa (7, 21), for papillomas the tongue and palate (22, 23) and both the giant cell granulomas and pyogenic granuloma have a greater predilection for the gingiva (24, 25).

These lesions have a slow and self-limiting growth. On studying the size we observed a mean of 9.10 ± 6.47 mm, within the parameters indicated by the authors in the literature (12, 18, 26-28).

Each type of lesion presents certain clinical characteristics that aid in determining the clinical diagnosis. One of these is the principal colour of the lesion. In our study we observed that 181 (60.3%) presented a colour similar to the normal mucosa, the majority of these corresponding to the group of fibromas which have a normal to pale colour due to the relative lack of blood vessels (7, 21, 26, 29). In 69 (23%) the colour was reddish, this group covering the vascular type tumors such as pyogenic granuloma and giant cell granuloma due to their high content of vascular spaces (2, 13, 25, 28). A whitish coloration was observed in 38 (12.7%), largely corresponding to papillomas, probably resulting from the presence of local irritation (8, 9, 22, 23). In 24 (8%) the colour was blue or violet, as in the hemangiomas with a proliferation of angioblastic mesenchyme (30) and lymphangiomas which are lesions made up of lymphatic vessels (31) while only 4 (1.3%) were yellow, including here tumors of adipose origin such as lipomas.

The majority of benign tumors of the oral mucosa present a smooth surface except for the papillomas which can demonstrate an ulcerated or warty-like surface (8, 9). When studying the clinical characteristics of the lesions we found that with respect to the surface 186 (62%) were smooth, while 114 (38%) were irregular. We found a large number of lesions with an irregular surface, since we observed that many lesions, especially fibromas and pyogenic granulomas, are ulcerated by local irritation.

One clinical characteristic common to all benign tumors of the oral mucosa is their consistency on palpation. This should be soft or elastic to the touch, but is rarely firm (2). On studying the consistency on palpation we observed that 109 (36.3%) were soft, 181 (60.3%) were elastic, while 10 (3.3%) were firm. It was observed that the longer the evolution the firmer the consistency due to the proliferation of fibroblasts and collagen fibers in response to local irritation and trauma.

Many authors (2, 3, 8, 12, 32) agree that benign tumors of the oral mucosa can present with a sessile or pedunculated base. With regard to the base of the lesion, we observed that 179 (59.7%) demonstrated a sessile base, while 121 (40.3%) were pedunculated, and only the pyogenic granulomas and the giant cell granulomas presented a higher incidence of a pedunculated base, as in other studies carried out by Baskar and Jacoway (24), who also highlighted the pedunculated base of this type of lesion.

The fibroma is the most frequent benign tumor of the oral cavity, constituted by a proliferation of fibroblasts and collagen fibers. The true fibroma is very rare and in the majority of cases corresponds to a fibrous hyperplasia caused by chronic irritation (12, 32). Of the 300 lesions studied, 153 (53.3%) were histologically diagnosed as fibroma, demonstrating that this is the most frequent benign tumor of the oral cavity.

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