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## Prevalence of biopsied oral lesions in a Department of Oral Surgery (2007 - 2009)

Claudia Fierro-Garibay <sup>1</sup>, Nieves Almendros-Marqués <sup>2</sup>, Leonardo Berini-Aytés <sup>3</sup>, Cosme Gay-Escoda <sup>4</sup>

<sup>1</sup> DDS. Resident of the Master in Oral Surgery and Implantology. Barcelona University Dental School.

<sup>2</sup> DDS. Master in Oral Surgery and Implantology. Associate Professor of Oral Surgery. Professor of the Master in Oral Surgery and Implantology. Barcelona University Dental School. Investigator of the IDIBELL Institute.

<sup>3</sup> MD, DDS, PhD. Assistant Professor of Oral and Maxillofacial Surgery. Subdirector of the Master in Oral Surgery and Implantology. Barcelona University Dental School. Investigator of the IDIBELL Institute.

<sup>4</sup> MD, DDS, PhD. Chairman of Oral and Maxillofacial Surgery. Director of the Master of Oral Surgery and Implantology. University of Barcelona Dental School. Coordinating investigator of the IDIBELL Institute. Head of the Service of Maxillofacial Surgery, Teknon Medical Center. Barcelona, Spain.

### Correspondence:

Centro Médico Teknon  
 Instituto de Investigación IDIBELL  
 C/ Vilana 12  
 08022 – Barcelona (Spain)  
<http://www.gayescoda.com>  
 E-mail: [cgay@ub.edu](mailto:cgay@ub.edu)

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 eMail: [jced@jced.es](mailto:jced@jced.es)

### Abstract

**Objectives:** To determine the prevalence of the hard and soft tissue lesions biopsied in the Department of Oral Surgery of the Barcelona University Dental Clinic (Barcelona, Spain).

**Study design:** A retrospective descriptive study was made of the biopsies performed between January 2007 and April 2009 in our Department of Oral Surgery. The following variables were recorded: age, the sex, location of the lesion, the biopsy technique, the reason for consultation, and the histological result obtained.

**Results:** A total of 460 lesions amenable to histological analysis and corresponding to 450 patients were analyzed. The most frequently biopsied lesions were maxillary cysts, including particularly root cysts (20%). Other very common disorders in our series were epithelial hyperplasias (10.6%) and fibromas (10%). There was a broad range of histopathological results, with un total of 36 different diagnoses. Three of the 460 biopsies yielded two squamous cell carcinomas and one ameloblastoma.

**Conclusions:** The most prevalent hard tissue lesions were chronic maxillary periapical lesions, while epithelial hyperplasias and fibromas were the most frequent soft tissue lesions. Emphasis is placed on the need for biopsy particularly for studying premalignant and malignant lesions, in view of the importance of securing an early diagnosis.

**Key Words:** , oral lesions, prevalence, epidemiology.

**Introduction**

Alterations of the tissues of the oral cavity can manifest in a great variety of ways. The clinical manifestations of many diseases of the oral cavity can be similar to the oral manifestations of certain systemic disorders – thus often making it difficult to establish a correct clinical diagnosis. In some cases, early-stage malignant lesions can be mistaken for benign lesions. This in turn can lead to incorrect treatment, and thus to potentially fatal consequences for the patient. Clinical examination and a thorough anamnesis can yield a tentative diagnosis. However, methods such as biopsy with posterior histopathological study are essential in many cases for establishing a definitive diagnosis (1).

Biopsies are designed to obtain tissue lesion samples from a live organism for microscopic study, with a view to establishing a definitive diagnosis of the lesion on the basis of its histological features, or for establishing a prognosis in the case of malignant and premalignant lesions. In some cases a biopsy can facilitate the definition of treatment strategies, contribute to evaluation of the efficacy of treatment, or give rise to a document with important medical-legal value (2).

The majority of studies of the most frequent lesions of the oral cavity have been carried out in Europe (1), Asia (2) and the United States (3).

The present study describes the cases biopsied in the Department of Oral Surgery of the Barcelona University Dental Clinic in the period between January 2007 and April 2009, and compares our findings with those published in the literature.

**Patients and Methods**

A retrospective descriptive study was made of 450 clinical histories that included the histopathology reports obtained from surgical interventions and biopsies performed during a 27-month period between January 2007 and April 2009. During this period, a total of 460 histopathological studies were made of lesions of the oral cavity in patients seen in the Department of Oral Surgery of the Barcelona University Dental Clinic (Barcelona, Spain). The lesions were biopsied by professors and residents of the Master in Oral Surgery and Implantology. The samples were submitted in 10% formalin solution with the corresponding registry form. From each of the clinical histories we compiled the following data: patient age, sex, clinical manifestations, the location of the lesion, the biopsy technique used, the reason for consultation, and the histological result.

The data obtained were subjected to a descriptive statistical analysis using the SPSS version 12.0 statistical package for Microsoft Windows (License of the University of Barcelona).

**Results**

We reviewed a total of 460 lesions corresponding to 450 patients. The mean patient age was 54 years (SD 10.3, range 9-87 years). The series showed a slight female predominance (50.8%, n=229 versus 49.2%, n=221).

Regarding the clinical manifestations, 37% of the patients had associated symptoms – the most frequent being pain (55%) and swelling (32%).

Of the total tissue samples, 64.1% corresponded to hard tissues and 35.9% to soft tissues. Regarding the soft tissues, the most common locations were the cheek mucosa (10.2%) and the alveolar mucosa (9.7%), while the most frequent hard tissue locations were the anterior sector of the upper maxilla (14.3%) and the and the posterior sector of the mandible (32.1%). The distribution of the lesions according to location is shown in Table 1.

	Number of cases	%
<b>Soft tissues</b>	<b>165</b>	<b>35.9%</b>
Lips	21	4.5%
Cheek mucosa	47	10.2%
Alveolar mucosa	43	9.7%
Palate	14	3.0%
Tongue	37	7.9%
Floor of the mouth	3	0.7%
<b>Hard tissues</b>	<b>295</b>	<b>64.1%</b>
UPPER MAXILLA		
Anterior sector	66	14.3%
Posterior sector	51	11.0%
MANDIBLE		
Anterior sector	31	6.7%
Posterior sector	147	32.1%

*Table 1. Location of the biopsied lesions.*

Most of the biopsies (83.9%) were excisional biopsies, while 16.1% were incisional biopsies.

Most of the patients (75%) visited the clinic due to awareness of the presence of the lesions, while in the rest of the cases (25%) the lesions constituted casual findings in the course of clinical explorations made for other reasons.

Thirty-six different histological diagnoses were established (Table 2). The most frequent lesions of the hard tissues were of a cystic nature (38.9%), and of these, the most common were found to be root cysts (51.6%), followed by follicular cysts (14%). In turn, 7.1% were periapical granulomas. Tumors of the hard tissues accounted for 4.1% of the lesions. With regard to the 125 periapical lesions analyzed, 73.6% were seen to be root cysts and 26.4% periapical granulomas.

As regards the soft tissues lesions, we recorded a 10.6% prevalence of epithelial hyperplasias, while fibromas and lesions compatible with oral lichen planus respec-

	%	Cases
Root cyst	20.0	92
Epithelial hyperplasia with hyperkeratosis	10.6	49
Fibroma	10.0	46
Follicular cyst	7.6	35
Fibrous hyperplasia	7.6	35
Paradental cyst	7.3	34
Periapical granuloma	7.1	33
Lichen planus	6.3	29
Squamous papilloma	2.8	13
Angiofibroma	2.6	12
Nonspecific inflammation	1.9	9
Residual cyst	1.7	8
Nonspecific ulceration	1.5	7
Epithelial dysplasia	1.3	6
Osteoma	1.3	6
Mucous retention cyst	0.9	4
Lateral periodontal cyst	0.9	4
Normal bone	0.9	4
Odontoma	0.9	4
Cementoma	0.9	4
Venous hemangioma	0.6	3
Candidiasis	0.6	3
Wart	0.4	2
Actinic cheilitis	0.4	2
Angioma	0.4	2
Melanocytic nevus	0.4	2
Squamous cell carcinoma	0.4	2
Fibrous dysplasia	0.4	2
Odontogenic keratocystic tumor	0.2	1
Nasopalatine cyst	0.2	1
Cementing bone dysplasia	0.2	1
Giant cell granuloma	0.2	1
Pulp polyp	0.2	1
Gingival cyst	0.2	1
Warthin's tumor	0.2	1
Ameloblastoma	0.2	1

Table 2. Histological diagnoses distributed according to frequency.

tively represented 10% and 6.3% of the lesions. Lastly, we diagnosed two squamous cell carcinomas and one ameloblastoma.

**Discussion**

In our series, 61.5% of the lesions appeared in patients over 40 years of age, while in the study published by Satorres et al. (1) this age group represented 49%. Regarding the incidence of biopsied lesions according to patient sex, no significant differences were seen between males (49.2%) and females (50.8%).

Satorres et al. (1), in a study similar to our own, examined the prevalence of oral lesions biopsied during the years 1995 – 1997. After reviewing 205 cases, the authors concluded that the most commonly biopsied entities were chronic periapical inflammatory lesions.

The most frequent soft tissue locations were the cheek mucosa (10.2%) and the alveolar mucosa (9.7%). According to Giana da Silveira et al. (4), most such lesions are found in the tongue. In our series lingual lesions represented 7.9%, while the posterior mandibular sector was the predominant site among the hard tissue lesions (32.1%). Similar results have been reported in the papers of Satorres et al. (1) and Meningaud et al. (5). Ochsenius et al. (6) and Jones et al. (7) considered that the frequency of lesions is greater in the anterior sector of the upper maxilla because this region is characterized by a larger presence of epithelial remains and is also exposed to a greater risk of trauma. The publications of Meningaud et al. (5) and of Jones et al. (7) only describe the prevalence of odontogenic cysts while the paper of Ochsenius et al. (6) describes the prevalence of odontogenic tumours.

Table 3 describes the prevalence of oral lichen planus in different studies.

Regarding mucous retention cysts or mucoceles, mention should be made of the high 10% incidence of these lesions reported by Nair et al. (8) in a sample of 550 patients. In contrast, at the lower limit we have the 0.43% incidence reported by Axell et al. (9) in 467 patients from Malaysia and Thailand. In our study these lesions represented 0.9% of the 460 biopsies reviewed.

According to Giana da Silveira et al. (4), papillomas represent 1.5% of all the lesions of the oral cavity, while in our study these lesions accounted for 2.8%. Prevalences similar to our figure have been reported elsewhere (1,8).

	Country	Year	Total sample size	Prevalence (%)
Present study	Spain	2009	460	6.3
Satorres et al. (1)	Spain	2001	206	4.9
Silverman (3)	United States	1997	570	2.0
Andreasen (16)	Sweden	1986	115	1.9
Vigild (17)	Denmark	1987	486	0.2

Table 3. Prevalence of oral lichen planus (OLP) in different studies.

	Country	Year	Number of maxillary cysts	Root cysts	Follicular cysts
Present study	Spain	2009	179	51.4%	14%
Satorres et al. (1)	Spain	2001	125	62.4%	28%
Jones et al. (7)	Ukraine	2006	7121	52.1%	18.2%
Prockt et al.(10)	Brasil	2008	680	72.50%	22.2%
Ledesma et al. (18)	Mexico	2000	304	38.8%	35.5%
Mosqueda et al. (13)	Mexico	1997	865	39.9%	33%

**Table 4.** Frequency of root cysts and follicular cysts with respect to the maxillary cysts registered in different studies.

The frequency of fibrous hyperplasia of the gums in our study was 7.6%, versus 5.4% according to Satorres et al. (1).

On the other hand, 60.3% of the hard tissue lesions were located in the mandible, while the remaining 39.7% were found in the upper maxilla. In the study published by Satorres et al. (1), 58% of the lesions were located in the mandible and 42% in the upper maxilla.

In relation to the maxillary cysts, which represented 38.9% of the total sample, the most frequent representatives were root cysts (51.4%). The fact that root cysts showed the highest prevalence is probably due to their inflammatory origin as a consequence of pulp necrosis secondary to caries, trauma or inappropriate restorations. Other authors have published similar results for root cysts (7,10). Root cysts of inflammatory origin represent over 19.5% of all biopsy diagnoses in the study of Satorres et al. (1), and 20% in our series. Table 4 compares our findings with those of other publications.

Another interesting epidemiological observation is the frequency of periapical granulomas, which in our series are observed in 71% of all biopsies. Satorres et al. (1) grouped root cysts and periapical granulomas as periapical lesions. Of their 77 documented periapical alterations, 52% were root cysts and 48% were periapical granulomas. According to Nair et al. (8), in a series of 256 periapical lesions, the frequency of granulomas was 50%, while 15% were root cysts and 35% periapical inflammations. Nobuhara and del Rio (11) histologically evaluated 150 extracted teeth that had been subjected to failed endodontic treatment: 59.3% were seen to be periapical granulomas, 22% root cysts and 18% other types of periapical pathology. Stockdale and Chandler (12) in turn compared the histological data of 1108 lesions biopsied after periapical surgery. Of these lesions, 18.8% were found to be root cysts and 77.3% were taken to be periapical granulomas. In our study, of the 125 periapical lesions analyzed, 73.6% were seen to be root cysts and 26.4% periapical granulomas. The percentage differences between studies are probably due to the different criteria of the pathologists, but particularly to whether the periapical lesions were associated to endodontic treatment or surgical indications. Thus, while some studies exclusively focus on registering periapical disease, others encompass any type of maxillary pathology. In

addition, the prevalence of the lesions tends to be conditioned by the characteristics of the center in which the diagnosis is established, as well as by the socioeconomic conditions of the country in which the study is made.

In our series, 4.1% of the biopsies were tumors located in hard tissues. According to Giana da Silveira et al. (4), odontomas account for 64% of the tumor lesions, while other series report prevalences of 30-40% (6,13,14). In our study their frequency was 21%. None of the publications establish histological differentiation between compound and complex odontomas.

Ikeda et al. (15) evaluated the incidence of malignant alterations of the oral cavity in 1319 subjects. They found that 4.9% of the patients had oral lesions, and of these, 1.4% were malignant tumors. The most commonly diagnosed malignancy in the majority of studies is squamous cell carcinoma. In our series the prevalence of this tumor was 0.4%.

In conclusion, the most prevalent lesions in our series were chronic periapical lesions in the maxillas and epithelial hyperplasias and fibromas in the soft tissues. The high frequency of hyperplastic alterations indicates a predominance of chronic conditions versus acute lesions. Considering that the former represent the continuation in time of the latter, it may be postulated that such problems could have been avoided by offering correct treatment at the right point in time. While the causes leading to this situation would be the subject of another study, we can point to factors inherent to the patients, professional factors, as well as to a lack of periodic clinical checks and adequate patient follow-up. Lastly, we wish to underscore the importance of biopsies in the study of premalignant and malignant lesions, considering the prognostic relevance of establishing an early diagnosis.

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