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TÍTULO

CONTROVERSIAS EN PATOLOGIA BUCAL

TESIS PARA OBTENER EL GRADO DE MAESTRO POR MEDIO DE LA MODALIDAD DE PRODUCTIVIDAD CIENTÍFICA

P R E S E N T A:

DANIEL QUEZADA RIVERA

TUTORA: DRA. ELBA ROSA LEYVA HUERTA

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Agradezco a todas las personas que me han apoyado e incentivado incondicionalmente para que, por fin, terminara la maestría.

ÍNDICE

1. INTRODUCCIÓN

La patología bucal en México tiene más de 35 años. La Universidad Nacional Autónoma de México, a través de la Facultad de Odontología, ha hecho grandes esfuerzos por buscar respuestas a los problemas bucodentales de la población.

Sabemos por experiencia, que la caries y la enfermedad periodontal ocupan los primeros sitios debido a su alta tasa de incidencia y prevalencia. Sin embargo, hay otros grupos importantes de lesiones, neoplasias y enfermedades que, aunque son menos frecuentes, requieren grupos interdisciplinarios para resolver las problemáticas más complejas que de ellas surgen. De esto, la necesidad de las especialidades odontológicas.

En la División de Estudios de Posgrado e Investigación, existen múltiples y nuevas especialidades odontológicas, además de laboratorios de investigación. Uno de los más originales es el Departamento de Patología Bucal, donde existe un sincretismo en la formación de recursos humanos a nivel licenciatura, especialidades, maestría y doctorado. El servicio de diagnóstico histopatológico y la clínica de medicina bucal también colaboran con otras áreas del conocimiento. Es así, que el abordaje de esta disciplina conduzca a trabajos tan aparentemente descontextualizados unos con otros. "La necesidad hace al hombre" diría Séneca.

Este trabajo tiene por objetivo presentar una recopilación de investigaciones que ofrecen resultados valiosos, logrados de población mexicana. Por lo cual, se presentan estos artículos publicados en revistas indexadas para valuar y acreditar como admitidos para la titulación del solicitante en el grado de Maestría en Odontología.

2. COMPILACIÓN

2.1.

Gaitan-Cepeda L, Quezada-Rivera D, Tenorio-Rocha F, Leyva-Huerta ER, Mendez-Sanchez E. Vascular leiomyoma of the oral cavity. Clinical, histopathological and immunohistochemical characteristics. Presentation of five cases and review of the literature. Med Oral Patol Oral Cir Bucal. 2008 Aug 1;13(8):E483-8.

En este artículo se presentan 5 casos de leiomiomas vasculares intraorales, son neoplasias benignas de músculo liso. Si bien son poco frecuentes, su presentación clínica es un nódulo asintomático de crecimiento lento y plantea diversos diagnósticos diferenciales como: neurofibroma, neurilemoma, hemangioma y neoplasias benignas de glándulas salivales menores. En estos casos, el promedio de edad fue de 38.6 años y con ligera predilección en mujeres. El tamaño fluctúo entre 0.7 a 1.7 cm, por lo que se procede a realizar una biopsia excisional.

Macroscópicamente son de forma circular u ovoide, bien delimitados, de superficie lisa y de color café con áreas hemorrágicas y consistencia firme.

Sus características histológicas muestran un predominio de células musculares lisas grandes, de citoplasma eosinófilo con núcleo de extremos redondeados. Pueden rodear vasos sanguíneos o formar proliferaciones sólidas en haces fusocelulares. En base a estas características, se han propuesto patrones: sólido, vascular y epitelioide.

El análisis inmunohistoquímico expresó que los cinco casos fueron intensamente positivos a: actina músculo liso, desmina y vimentina, confirmando un panel para el leiomima vascular, y concluyendo que el CD34 solo marca a las células endoteliales y no se requiere para obtener el diagnóstico, pero si es útil para descartar otras posibilidades diagnosticas de morfología semejante, como se muestra en el siguiente cuadro.

Neoplasia	Anticuerpos				
	Vimentina	Desmina	Actina	CD34	S-100
Leiomioma	+	+	+	-	-
Miofibroma	+	-	+	-	-/+
Miopericitoma	+	-	+	-	-
Tumor miofibroblástico inflamatorio	+	+/-	+	-	-
Histiocitoma	+	+	+/-	-/+	-

2.2

Gaitán-Cepeda LA, Quezada-Rivera D, Tenorio-Rocha F, Leyva-Huerta ER. Reclassification of odontogenic keratocyst as tumour. Impact on the odontogenic tumours prevalence. Oral Dis. 2010 Mar;16(2):185-7.

El objetivo de este estudio se fundamenta en el hecho de que la Organización Mundial de la Salud, publico en su libro "Clasificación de tumores" en el 2005, una reclasificación del queratoquiste odontogénico, de quiste a neoplasia benigna, y su cambio de nombre a tumor odontogénico queratoquístico (TOQ). Por lo tanto, las implicaciones de este cambio repercuten en la frecuencia relativa, tanto de los quistes como de las neoplasias odontogénicas. Es decir, antes del 2005, el odontoma, el ameloblastoma y el mixoma ocupaban los tres primeros lugares. Al incluir al TOQ desplazo al odontoma al segundo lugar. Este incremento pudiera resultar ficticio, sobre todo para los programas preventivos de la salud bucal y en su tratamiento.

Se tiene la certeza de que es una lesión potencialmente agresiva, por lo que nos alerta al establecer el diagnóstico, ya que lo difícil no es diagnosticarlo sino el tratamiento, debido a la ambigüedad del comportamiento quístico pero altamente destructivo. Una evidencia débil sugiere que el TOQ se puede malignizar. ¿Bajo qué circunstancias? ¿Cuáles son los eventos para esto ocurra? Eso se está por determinar, pues en pocas ocasiones muestra displasia epitelial, que por lo general

nos alerta hacia el desarrollo de un carcinoma. ¿Qué se debe hacer?, un seguimiento a largo plazo. Eso es lo ideal, pero no lo real. Los pacientes se pierden, y cuando regresan, ya no existe un seguimiento estricto, o inclusive ya no existe un registro del caso.)

El tratamiento más coherente, es hacer marsupialización, intentando disminuir al menos un 50 % de tamaño, permitiendo al cirujano una enucleación más simple, alternada con osteotomía marginal controlada, aplicación de solución de Carnoy y seguimiento a largo plazo. La opción de tratamiento es la utilización de varios procedimientos más conservadores, para disminuir las secuelas y dar al paciente una mejor calidad de vida. El reto es enorme, y las posibilidades de ofrecer un tratamiento efectivo requiere de estudios multidiciplinarios y la colaboración internacional.

2.3.

Gaitán-Cepeda LA, Peniche-Becerra AG, Quezada-Rivera D. Trends in frequency and prevalence of oral cancer and oral squamous cell carcinoma in Mexicans. A 20 years retrospective study. Med Oral Patol Oral Cir Bucal. 2011 Jan 1;16 (1):e1-5.

El cáncer oral representa aproximadamente el 5.0 % de todas las neoplasias malignas del cuerpo, aunque existen variaciones demográficas y étnicas de acuerdo a la genética, la alimentación y a los hábitos de alcoholismo y tabaquismo. Es un porcentaje relativamente bajo en relación a otras enfermedades más frecuentes, su morbilidad y mortalidad, sin embargo, son muy altas. Además, los recursos de infraestructura y personal médico para su tratamiento son costosos.

Como en México no existen cifras que proyecten las expectativas a corto, mediano y largo plazo de esta enfermedad, se hace necesario conocer su relativo incremento para reforzar los programas de atención. Así como implementar campañas de promoción para la salud para prevenirlo y para su detección temprana.

2.4.

Tapia JL, Quezada D, Gaitan L, Hernandez JC, Paez C, Aguirre A. Gingival melanoacanthoma: case report and discussion of its clinical relevance. Quintessence Int. 2011 Mar;42(3):253-8.

Las máculas pigmentadas en la mucosa bucal muestran una amplia gama de entidades de conducta biológica diversa, desde las de comportamiento benigno e indolentes como: argirosis focal, mácula melanótica, nevo melanocítico, melanosis de fumador y pigmentación inducida por medicamentos; hasta la de comportamiento maligno como el melanoma. Por lo cual toda lesión pigmentada debe ser estudiada y diagnósticada. Aunque el melanoacatoma es poco frecuente, el reconocimiento de sus características histopatológicas e inmunohistoquímicas son necesarias para su diagnóstico, y para determinar su histogénesis y etiopatogenia.

2.5.

Mejía-Velázquez CP, Durán-Padilla MA, Gómez-Apo E, Quezada-Rivera D, Gaitán-Cepeda LA. Tumors of the salivary gland in Mexicans. A retrospective study of 360 cases. Med Oral Patol Oral Cir Bucal. 2012 Mar 1;17(2):e183-9.

En la más reciente clasificación de neoplasias en glándulas salivales del 2005, la Organización Mundial de la Salud incluye a neoplasias de origen epitelial, mesenquimal y hematolinfoides. Proponiendo 27 diferentes tipos de neoplasias malignas y neoplasias benignas. Referidas estrictamente en base datos anglosajones y europeas. Al no contar con un registro nacional de neoplasias de origen glandular. El objetivo de este artículo es conocer la prevalencia relativa de este grupo de lesiones que afectan a nuestra población. Los datos indicaron que, afortunadamente, la mayoría eran benignas, en mujeres y en la glándula parótida, dónde pueden ser detectadas de manera incipiente. De estas el adenoma pleomorfo fue el más frecuente. Las

neoplasias malignas epiteliales como el carcinoma adenoideo quístico y carcinoma mucoepidermoide afectaron a glándulas salivales menores intraorales, principalmente las de paladar. De las neoplasias linfoides, el linfoma tipo MALT (tejido linfoide asociado a mucosas) fue el de mayor prevalencia. Y todos los linfomas ocurrieron en glándulas salivales mayores y en mujeres.

3. CONCLUSIONES

- **Los procesos patológicos son diversos, y como todo fenómeno biológico, su conducta es "impredecible", hasta cierto punto. Una de las funciones de un investigador en esta área es generar el conocimiento básico nuevo sobre la etiología y patogenia de todas y cada una de las lesiones en cavidad bucal, el objetivo es conocer el comportamiento biológico de ellas y así implementar medidas de atención certeras y con base científica. Por lo cual, el aprovechamiento de las nuevas técnicas moleculares y genéticas viables serán el futuro de las investigaciones a desarrollarse. Sabemos que los carcinomas en cavidad bucal son multifactoriales y que evolucionan en varias etapas, alterando la proliferación celular y la apoptosis. Sin embargo, esta enfermedad también está relacionada con hábitos, costumbres, alimentación, entre otras circunstancias, es decir, de conductas sociales y económicas de la población. La evidencia señala que estas neoplasias epiteliales han incrementado su prevalencia en las mujeres y en personas más jóvenes. Es así, que la difusión sobre los carcinógenos es responsabilidad de todos los profesionales dedicados al área de la salud.**

- **Por otro lado, los conceptos y las clasificaciones se superponen, lo que confunde. Como explicar que es un quiste de comportamiento neoplásico o una neoplasia de comportamiento quístico. El ejemplo es el tumor odontogénico queratoquístico, ¿cómo una neoplasia puede resolverse mediante un el proceso físico de la marsupialización? ¿qué pasa con esas células epiteliales positivas a los marcadores inmunohistoquímicos de proliferación celular y/o después de la marzupia, como Ki-67, p53, bcl-2, Bax? ¿qué sucede con las mutaciones en el gen de supresión tumoral (PCTH) encontradas en este quiste neoplásico? Y de otros genes sobreexpresados en 12q13 (citoqueratina 6b, receptor del**

factor de crecimiento epidermal, cadherina 18 y la molécula de adhesión celular leucocitaria).

Además, recientemente se han utilizado otros marcadores, relativamente noveles, en este tumor odontogénico queratoquístico, y que pudieran estudiarse más: colágena IV, metaloproteinasa 9, inhibidores de las metaloproteinasas, CD105, CD34, osteoprotegerina, RANK, etc.

- **La neoplasias benignas y malignas en las glándulas salivales, llaman poderosamente la atención pues la mayoría predominan en el género femenino, con algunas excepciones. ¿Porque? Tal vez porque su metabolismo es más hormonal. ¿Cómo demostrarlo? Los estudios retrospectivos, dentro de sus limitaciones, pueden orientar hacia líneas de estudios prospectivos. En base a esos datos, se pueden desarrollar investigaciones sobre la prevención, la detección temprana, la identificación de los factores pronósticos que indiquen la evolución de cada neoplasia, la creación de tratamientos menos radicales para que la calidad de vida de los enfermos sea la mejor posible. Una interesante opción es la biopsia por aguja fina, método poco invasivo; que junto con la aplicación de marcadores inmunohistoquímicos y/o genéticos se puede elevar su sensibilidad y especificidad.**

4. ANEXOS

Vascular leiomyoma of the oral cavity. Clinical, histopathological and immunohistochemical characteristics. Presentation of five cases and review of the literature

Luis Alberto Gaitan Cepeda, Daniel Quezada Rivera, Fernando Tenorio Rocha, Elba Rosa Leyva Huerta, Edgar Ramiro Mendez Sánchez

Laboratorio de Patología Clínica y Experimental, División de Estudios de Postgrado e Investigación, Fac. de Odontología, Universidad Nacional Autónoma de México

Correspondence:
Dr. Luis Alberto Gaitán Cepeda
Laboratorio de Patología Clínica y Experimental.
División de Estudios de Postgrado e Investigación,
Facultad de Odontología, Universidad Nacional Autónoma de México.
Circuito Institutos s/n, Ciudad Universitaria, Coyoacán 04510,
México, D.F. México.
E-mail: lgaitan @ servidor.unam.mx

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http://www.medicinaoral.com/medoralfree01/v13i8/medoralv13i8p483.pdf

Abstract
Leiomyoma, a benign neoplasia arising from smooth muscle is an uncommon neoplasia of the oral cavity. The most common histological subtype in the oral cavity is the vascular one. To supplement information on vascular leiomyoma of the oral cavity (VLOC), we present cases of VLOC describing their clinical, histological, and immunohistochemical characteristics. Case reports. Five cases of VLOC (3 females; 2 males) from the Clinical and Experimental Pathology Laboratory, Dental School, National Autonomous University of México, are included. The most frequent clinical characteristic of VLOC was a single, asymptomatic, slow growing nodule. The age average of the cases was 40.6, however 3 out of our 5 cases were ≤ 40 years old at the moment of their diagnosis. The lesions were composed of fusiform cells arranged in bundles or fascicles. The neoplastic cells were characterized by eosinophilic cytoplasm and tapered nuclei. The presence of vascular spaces was prominent in all cases. The immunocharacteristics of VLOC neoplastic cells were: alpha smooth muscle (+); vimentin (+), desmin (+), CD34 (-) and S-100 protein (-). The endothelial cells of vascular spaces were CD34 (+). Differential diagnosis of VLOC with fusocellular neoplasm is discussed.

Key words: *Vascular leiomyoma, oral cavity.*

Introduction
Leiomyoma, a benign neoplasia arising from smooth muscle is an uncommon tumor of the head and neck region (1,2). Leiomyoma is a rare neoplasia of the oral cavity (1,2). It has been proposed that the origin of leiomyoma in the oral cavity arises from vascular smooth muscle and excretory ducts of salivary glands (3,4). The clinical characteristics of vascular leiomyoma of the oral cavity (VLOC) include: asymptomatic nodules of variable size and slow growth, located principally in the tongue, lips, palate and buccal mucosa (5). Most of the VLOC are diagnosed during the 5th decade of life (1-5). Surgical excision is an effective treatment for this neoplasia (5). With the aim of better understanding this particular neoplasm we present 5 cases of vascular leiomyoma of the oral cavity and additionally we performed a review of the scientific literature updating their clinical, histological and immunohistochemical features.

Case Reports
All the cases were referred to the Oral Pathology Service, Postgraduate Division, Dental School, National Autonomous University of México. In all cases, excisional biopsies were performed in the Maxillofacial and Oral Surgery service at the same institution. All of the surgical samples were fixed in 10% buffer formalin for a minimum

of 48 hours, embedded in paraffin and cut at 5 μm to be stained with Hematoxylin-Eosin technique. Additionally, histological slides were obtained to performed immunohistochemical technique.

Case 1

A 39 year old Hispanic female was referred by a private dentist because of a swelling in the retromolar area. On clinical inspection a unique asymptomatic, mobile, well delimited nodule was observed in the lower left retromolar area. The patient was not aware of an increase in the size of the nodule during the previous year. Macroscopically the specimen (0.9 x 0.6 x 1 cm) had an irregular oval shape, a smooth surface and a brownish color. Microscopically the lesion was composed of an abnormal proliferation of mesenchymal cells with a fusiform aspect, eosinophilic cytoplasm and tapered nuclei. Several vascular formations were observed. The stroma was characterized by fibrous connective tissue with inflammatory cells and focal hemorrhagic areas. We emitted a diagnosis of vascular leiomyoma.

Case 2

A 27 year old Hispanic female was referred by her private dentist because during a routine radiographic inspection a unilocular radiolucency located in the left mandibular region was found. The patient was not aware of the presence of the lesion. Macroscopically the specimen (1.4 x 1.3 x 1 cm) had an oval shape, a resilient consistency, and a brownish color with hemorrhagic areas on its surface. Microscopically the lesion consisted of a well circumscribed lesion formed by bundles of fusiform cells with elongated nuclei. The neoplastic cells were arranged around vascular spaces that were lined by endothelial cells. We emitted a diagnosis of an intraosseous vascular leiomyoma.

Case 3

A 43 year old Hispanic female was admitted at the Oral Pathology service because of the presence of a well circumscribed, firm, asymptomatic and mobile nodule in the lower lip. The patient had been aware of the lesion for 9 months. Macroscopically the specimen (0.7 x 0.5 x 0.4 cm), had an irregular oval shape, a smooth surface and a resilient consistency. Microscopically the lesion consisted of a well defined proliferation of fusiform cells with eosinophilic cytoplasm and tapered nuclei with rounded endings. The neoplastic cells were arranged in intercalated fascicules. We observed several blood vessels. We emitted a diagnosis of vascular leiomyoma.

Case 4

A 36 year old Hispanic male, was referred by his private dentist because of the presence of a unique, firm, well circumscribed nodule in the mucosa of the upper lip mucosa (Figure 1). The lesion had been asymptomatic during 7 years, since the patient noticed the lesion. Macroscopically the specimen (1.5 x 1.0 x 1.0 cm) had an irregular shape, a light brown color with hemorrhagic areas and a firm consistency. Microscopically it consisted of a partially circumscribed neoplasia with a biphasic cellular pattern: areas of fusiform cells characterized by elongated nuclei (cigar-like shape) with eosinophilic cytoplasm and areas of epithelial-like cells with cells characterized by basophilic nuclei. The vascular component was predominant in the fusiform cell area. Based on these characteristics, we emitted a diagnosis of vascular leiomyoma.

Case 5

A 48 year old male was referred by his private dentist because of a swelling in his upper lip. On clinical inspection, an asymptomatic swelling, covered by mucosa with inconspicuous characteristics was found. Macroscopically the specimen (1.7 x 1.0 x 1.0 cm) had an ovoid shape and a brownish color. Microscopically fusiform cell proliferation, with elongated nuclei and eosinophilic cytoplasm was observed. Several blood vessels lined by a thin layer of endothelial cells were observed intercalated in the fascicules. The neoplasia was well circumscribed and evidenced recent hemorrhage in the periphery. We emitted a diagnosis of vascular leiomyoma.

Figure 1 and 2 show the most striking clinical and histological characteristics of VLOC reported in the present paper.

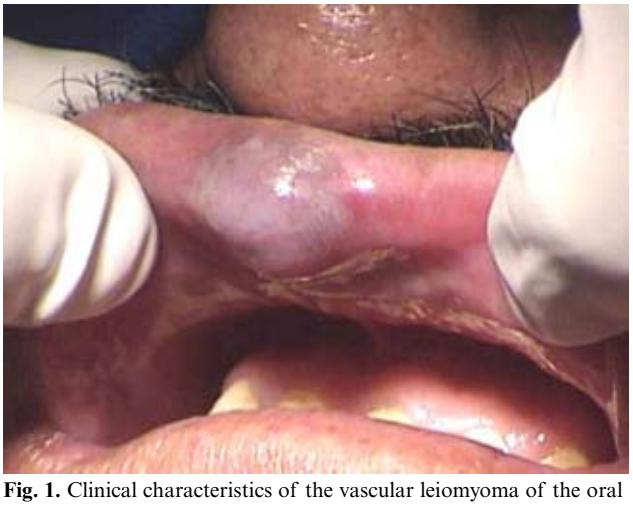

Fig. 1. Clinical characteristics of the vascular leiomyoma of the oral cavity.

This microphotography shows the typical clinic aspect of vascular leiomyoma, e.g. a single, asymptomatic, slow growth nodule (Case 4).

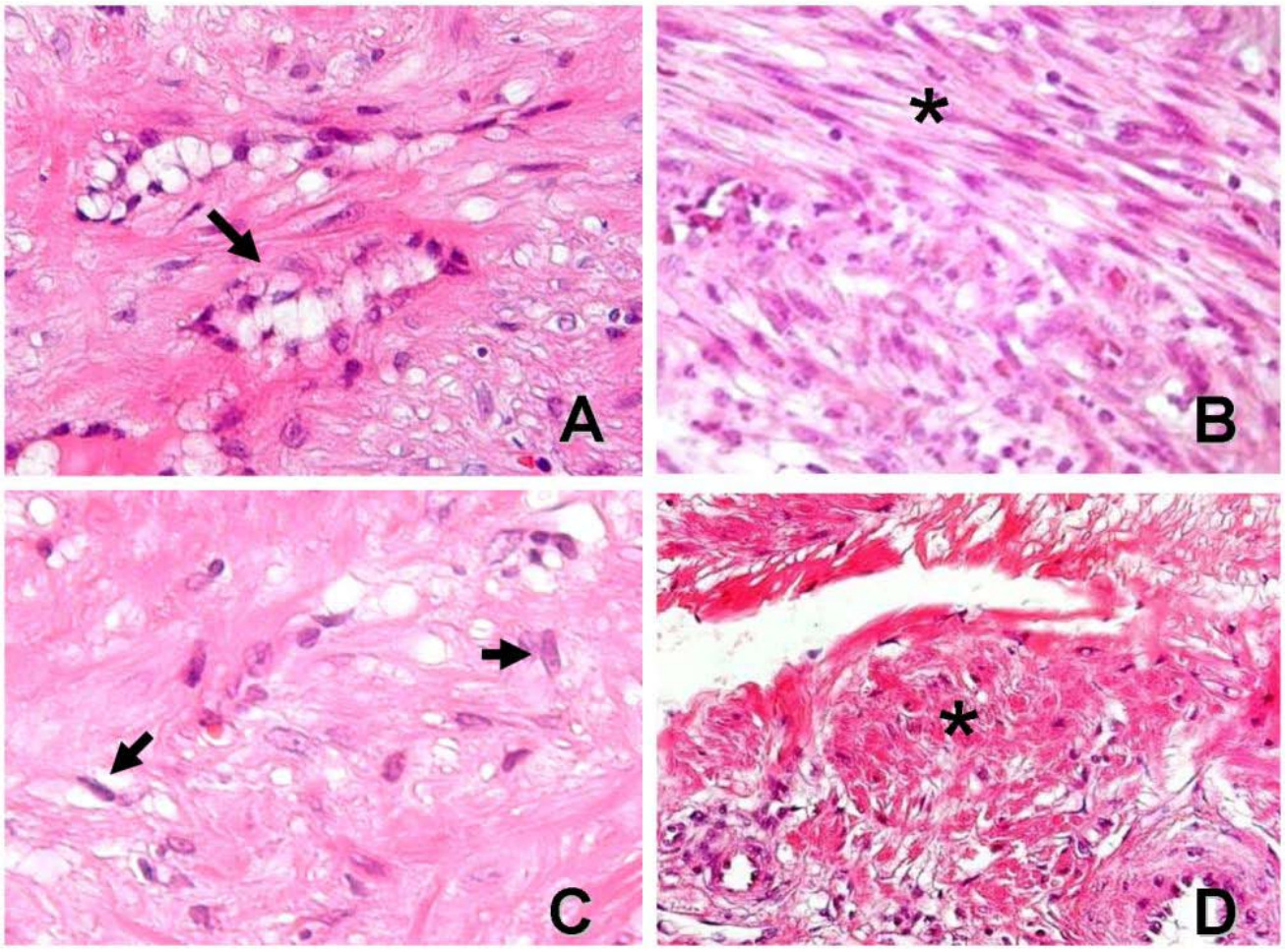

Fig. 2. Histopatological characteristics of the vascular leiomyoma of the oral cavity.

A).- Observe the vascular spaces (arrow) in relation to stromal oedema.
Case 1, H-E- X200.

B).- This microphotography show the fusocellular pattern (*) of vascular leiomyoma.
Case 2. H-E X400

C).- In this microphotography it can observes tapered cells with a cigar-shape nuclei (arrows), conspicuous characteristic of vascular leiomyoma neoplasm cells.
Case 3; H-E X400

D).- This microphotography show a heterogeneous cellular area, specifically an the epithelial-like cells area (*). Case 4; H–E X200.

Immunohistochemistry

All cases were analyzed by a immunohistochemical technique using the following immunemarkers: anti-vimentin (Bio SB®, Santa Bárbara, CA), anti-actin (Biogenex®, San Ramón, CA), anti-CD34 (Biogenex®, San Ramón, CA) and anti-S-100 protein (Bio SB®, Santa Bárbara, CA) antibodies. In all of the cases we were able to observe a strong anti-actin immunoreactivity of the cellular membrane of the neoplastic cells (Fig 3-A). Regarding to anti-desmin antibody we observed a positive immunoexpression of the cytoplasm of neoplastic cells in all cases (Fig 3-B). In regard to CD34 antibody, there was positive immunoreactivity of the endothelial cells that lined the vascular spaces (Fig 3-C). In all cases the neoplastic cells showed positive immunoreactivity against vimentin, the cytoplasm of the fusiform cells was the site of immunoexpression (Fig 3-D). We did not observe immunoreaction to anti-CD34 in any neoplastic cell. The epithelia-like cells (case 4) expressed positive immunoreaction for smooth muscle actin and vimentin. We did not find evidence of positive immunoreaction to protein S-100 in any neoplastic cell from any case.

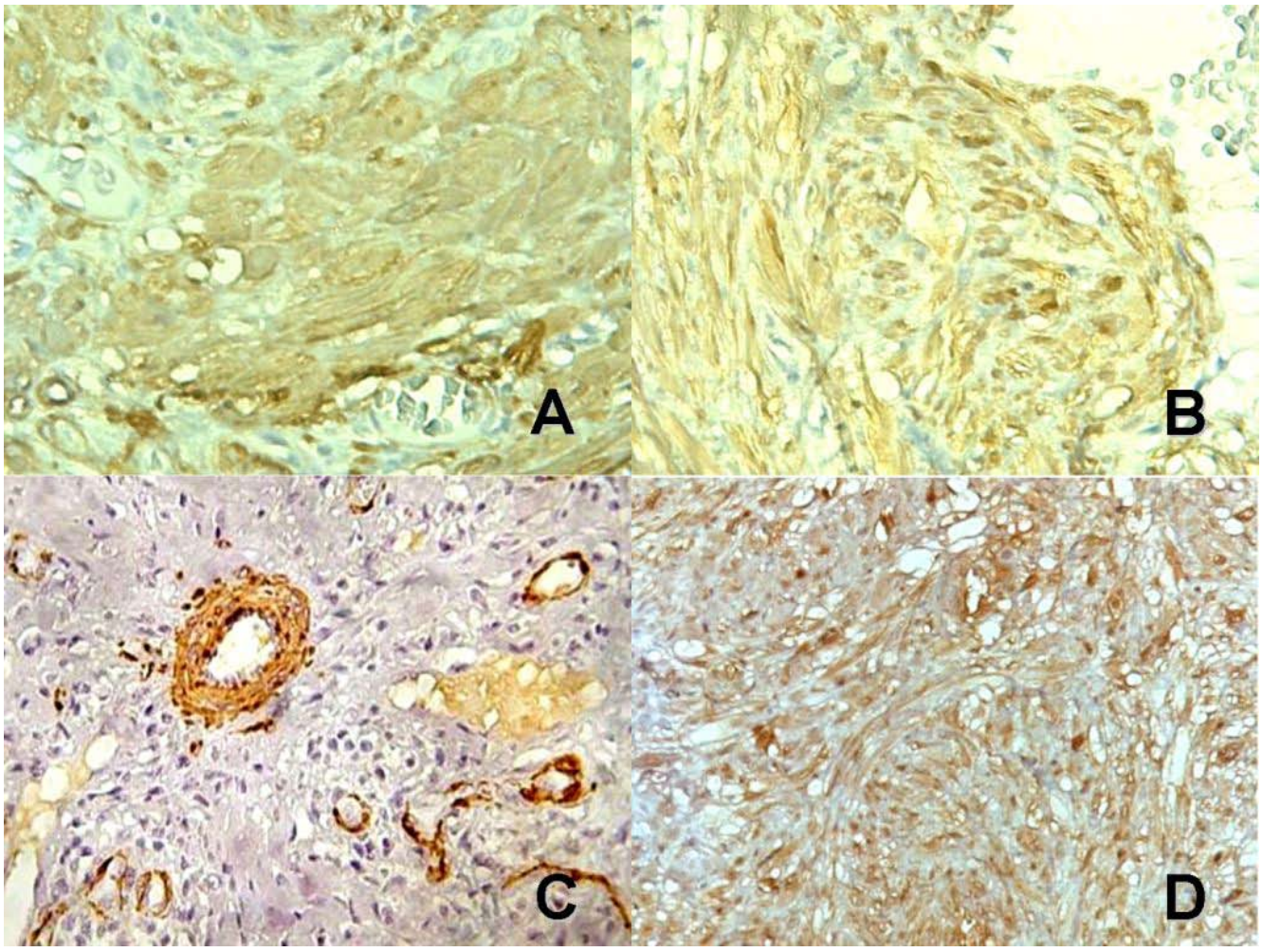

Fig. 3. Immunohistochemical characteristics of the vascular leiomyoma of the oral cavity.

A).- Positive immunoreactivity against anti alpha-actin smooth muscle antibody showed by cellular of neoplastic cells. X100.

B).- Positive immunoreaction against anti-desmin antibody showed by cytoplasm of neoplastic cells. X200.

C).- Positive immunoreaction against anti-CD34 antibody showed by the endothelial cells lined the vascular spaces. X100.

D).- Positive immunoreaction against anti-vimentin antibody showed by cytoplasm of fusiform cells. X200.

Discussion

Benign neoplasms that arise from smooth muscle are uncommon in the oral cavity region (1, 2). The VLOC is characterized clinically by asymptomatic solitary nodules, of long evolution and slow growth (6, 7). None of our cases was over 2cm diameter. The mucosa that covers them is similar to the adjacent mucosa.

The highest prevalence of head and neck leiomyoma is observed in 4th and 5th decade of life, with a peak of prevalence between 40 and 49 years of age (8). In our cases, the average age was 40.6 years; however 60% of our patients were under 40 years of age at the moment of their diagnosis. 3 of our cases were in female patients. The gender preference for female is agreement with the literature (1- 6).

It is important to highlight the case of an oral intraosseous leiomyoma (case 3); to date and to the best of our knowledge only 15 cases of oral intraosseous leiomyoma have been reported. Radiographically the oral intraosseous leiomyoma is characterized by an uni or multilocular radiolucency, generally with a sclerotic border without cortical displacement. It has been suggested that oral intraosseous leiomyoma arises from the muscle layer of the intramandibular blood vessels or from embrionary rests

of smooth muscle trapped in the mandibular region (for a review see 9, 10).

Several histological types of leiomyoma have been reported in the literature: solid, vascular (angiomyoma or angioleiomyoma) and epithelioid (11). Cases with predominant granular cells whose immunophenotype is in accordance to the leiomyoma have also been reported (12). The vascular variant is the most frequent in the oral cavity; 75% of all cases correspond to this histological type (1 – 6). Smooth muscle is scarce in the oral cavity, however this region is rich in blood vessels. Therefore it has been proposed that media layer of blood vessels may be the origin of oral cavity vascular leiomyoma (1).

The vascular leiomyoma is characterized by a well defined proliferation of mesenchymal tapered cells with eosinophilic cytoplasm and elongated basophilic nuclei that show tapered endings (cigar like shape nuclei). The vascular spaces which are lined by a single layer of endothelial cells (2-6, 11) are a constant feature in vascular leiomyoma. It is not uncommon to observe vascular leiomyoma with an heterogenic cell population; two or more different histological patterns could be interlaced in the same lesion, as in case 4.In this particular case, fusiform and epithelial-like cells areas were observed.

Scientific literature about the immunohistochemical characteristics of leiomyoma is scarce (3, 7, 13). The importance of assessing their immunocharacteristics is to contribute to differential diagnosis, specifically to rule out other neoplasia of the soft tissue, mostly mesenchymal lesions with predominance of fusiform cells (14). Smooth muscle actin corresponds to the alpha fraction of the actin chain (15); it is a specific immunomarker of smooth muscle although it could also have an immunoreaction in skeletal muscle (15). In all our cases the neoplastic cells showed positive immunoreaction to actin. Vimentin is a structural protein of the cytoplasm filaments of mesenchymal cells (15). Its expression in our VLOC cases was observed in the cytoplasm of the neoplastic cell population. CD34 is a transmembrane protein that is broadly expressed by vascular endothelium (15). In all of our cases, the endothelial cells presented immunoreactivity against anti-CD34 antibody.

Differential diagnosis of VLOC should include soft tissue neoplasias characterized by fusiform cells (16, 17). The solitary myofibroma of the oral cavity is a benign neoplasm characterized by proliferations of fibroblasts and myofibroblasts (18, 19). It is mostly observed between the 1st and 2nd decades of life, in contrast to leiomyomas which are frequent in the adult population. Histologically the solitary myofibromas are well defined lesions with a cellular component of fusiform cells with a tapered nucleus and undefined cytoplasm borders (18, 19). The solitary myofibroma has an important vascular component; therefore this neoplasm could show an angiopericytoma-like aspect with a peripheral desmoplastic reaction (18, 19). The typical immunophenotype of myofibroma is very similar to the leiomyoma: positive immunoreactivity against actin and vimentin. However, VLOC is S-100 negative and desmin positive, while myofibroma is S-100 positive (18, 19). Another differential diagnosis of VLOC is oral cavity myopericytoma (17). The oral cavity myopericytoma shares clinical and histological characteristics with VLOC. The myopericytoma belongs to the myoid and pericytoid neoplasms. The histological characteristics include a tapered cellular population, with elongated nucleus with round endings (cigar shape) similar that to observed in vascular leiomyoma (20). The intravascular variant of myopericytoma is a rare variant characterized by an intravascular mass similar in appearance to vascular leiomyoma (21). On the other hand, the oral inflammatory myofibroblastic tumor is a controversial lesion characterized by fusiform cells arranged in whirls (22, 23). The immunophenotype of oral inflammatory myofibroblastic tumors share some characteristics with vascular leiomyoma. Both lesions are vimentin positive, but leiomyoma are alpha-actin smooth muscle positive and desmin positive; while oral inflammatory myofibroblastic tumors show variable immunoreactivity against alpha-actin smooth muscle and against desmin (22, 23). A comparison of the immunophenotype of vascular leiomyoma versus some soft tissue fusocellular neoplasias is shown in table.

In conclusion, the oral cavity leiomyoma is a benign neoplasm characterized by a small (<2 cm), solitary, asymptomatic, nodular mass, located more frequently in

Table 1. Immunohistochemical profile of several fusocellular neoplasms, including the vascular leiomyoma.

Neoplasia	Antibodies				
	Vimetin	Desmin	Actin	CD34	S-100
Leiomyoma	+	+	+	-	-
Myofibroma	+	-	+	-	-/+
Myopericytoma	+	-	+	-	-
Inflammatory Myofibroblastic Tumor	+	+/-	+	-	-
Histiocytoma	+	+	+/-	-/+	-

the lower lip with predilection for 35 – 49 years old women. Histologically it is characterized by tapered cells, with undefined cytoplasm borders, hyperchromatic nucleus with rounded endings (cigar shape) where the vascular component is secondary to the cellular one. The immunophenotype of the neoplastic cells is: alpha-smooth muscle actin (+), vimentin (+), desmin (+), CD34 (-) (although the endothelium of the vascular spaces is CD34 +); and S-100 protein (-).

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ORIGINAL ARTICLE

Reclassification of odontogenic keratocyst as tumour. Impact on the odontogenic tumours prevalence

LA Gaitán-Cepeda, D Quezada-Rivera, F Tenorio-Rocha, ER Leyva-Huerta

Oral Pathology Laboratory, Dental School, National Autonomous University of México, México City, México

AIM: The aim of this study was to establish the impact of the redefinition and reclassification of odontogenic keratocyst (OKC) as a tumour on the prevalence of odontogenic tumours (OT).
METHODS: We revised 15 435 files of a teaching head and neck histopathology service in the time period from January 1981 to December 2008 and 478 cases of OT were selected. The 342 cases from 1981 to 2004 were classified according 1992 to the World Health Organization (WHO)-classification (excluding keratocystic OT) while the 136 cases from 2005 onwards were classified according to the 2005 WHO-classification (including keratocystic OT). Age and gender were obtained from medical records. The frequency distribution and prevalence of OT from each periods of time were compared. A chi-square test was performed ($P < 0.05$ 95% confidence interval).
RESULTS: The prevalence of OT increases 92% in the 2005–2008 period; from 2.6% (1981–2004 period) to 5% (2005–2008 period) (*P* 0.000).The most frequent OT in the 1981–2004 period was odontoma (45% of all OT) while in the 2005–2008 period was Keratocystic Odontogenicv Tumour (38.9%). Conclusions. The redefinition of OKC as a tumour produced an increase in the frequency and prevalence of OT.
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Keywords: odontogenic keratocyst; keratocystic odontogenic tumour

Introduction

In 2005, the World Health Organization (WHO) redefined the odontogenic keratocyst (OKC) as a result of its biological behaviour, as a benign tumour of odontogenic origin. They named it keratocystic odontogenic tumour (KCOT) and included it in the group of benign odontogenic tumours (OT) derived from odontogenic epithelium with mature, fibrous stroma without odontogenic ectomesenchyme (Barnes *et al*, 2005). Regardless of the redefinition and reclassification of KCOT aroused controversy in different oral pathologist groups (Reichart and Philipsen, 2006; Madras and Lapointe, 2008), the impact of the redefinition and reclassification of KCOT on the prevalence and epidemiological profiles of OT it is not known. Therefore the principal objective of this report is to establish the frequency distribution and prevalence of OT before and after 2005 using an archive of a Mexican teaching service of head and neck histopathology.

Material and methods

The files of the Histopathology service of the Dental School, National Autonomous University of México were revised from January 1981 to December 2008. This histopathology service is the most important centre of diagnosis of head and neck pathology in all the country (México). All the cases with diagnosis of odontogenic cysts (OC) or OT were identified and selected.

To be included in this study, the cases should have biological material imbedded in paraffin and histological slides. If necessary, additional histological slides were obtained (5 μm) and stained with Haematoxylin and Eosin technique. All the selected cases were reviewed by two head and neck pathologist (DQR and FTR) and classified according to the 1991 WHO-classification to 1981–2004 cases (Kramer *et al*, 1992); and the 2005 WHO-classification (Barnes *et al*, 2005) to 2005 onwards cases. Demographical data (age at moment of diagnosis and gender) were obtained from medical records.

The prevalence of OT was established with regard to the total of biopsies per year. The frequency distribution and prevalence of OT from January 1981 to December 2004 were compared with frequency distribution and prevalence of OT obtained from January 2005 to December 2008. To statistical purposes, a chi square test was performed ($P < 0.05$ 95% confidence interval)

Correspondence: Dr LA Gaitán Cepeda, Laboratorio de Patología Clínica y Experimental, División de Estudios de Postgrado e Investigación, Facultad de Odontología, Universidad Nacional Autónoma de México, Circuito Institutos s/n, Ciudad Universitaria, Coyoacán 04510, México. Tel: (52) 55 5622 5559, Fax: (52) 55 5622 5559, E-mail: lgaitan@servidor.unam.mx
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using the EPI INFO 3.4.3 software package (Atlanta, GA, USA) (CDC).

Results

During the time period of our study (from January 1981 to December 2008), 15 435 files were revised (Table 1). From the 12 729 files analysed from 1981 to 2004, 1113 were OC while 342 were OT. The most frequent OC was the radicular cyst with 503 cases (45.1%) followed by dentigerous cyst with 385 cases (34.5%) and OKC with 213 cases (19.1%).On the other hand, OT were distributed as follows: 154 cases (45%) were odontomas; 76 (22%) were ameloblastomas; and 51 (14.9%) had a diagnosis of odontogenic myxoma. From January 2005 to December 2008, 2706 files were analysed, 209 were OC and 136 were OT. The most frequent OC was the radicular cysts with 119 cases (56.9%), followed by dentigerous cyst with 90 cases (43%). In regard to OT, the most frequent was KCOT with 53 cases (38.9%) followed by odontoma with 42 cases (30.8%) and ameloblastoma with 25 cases (18.3%). The frequency distribution of all OC and OT is shown in Table 2.

The prevalence of OT from 1981 to 2004 was 2.6%, while the prevalence of OT from 2005 to 2008 was 5%. This represents an increase in the prevalence of OT of 92% ($P = 0.000$). However, if the KCOT is excluded in the 2005–2008 period, the prevalence of OT is 3%, very similar to the 1981–2004 prevalence. On the other hand the prevalence of OC was very similar in both time periods: 8.7% (1981–2004) *vs* 7.7% (2005–2008) ($P > 0.05$). In the period 1981–2004, the prevalence of OT was very similar in both genders: 2.6% in female and 2.7% in males. In the period 2005–2008 a lightly male predominance in the OT prevalence was observed: 5.4% in males and 4.7% in females.

Discussion

Our results show that the redefinition of OKC as a neoplasia and its latter reclassification as a benign tumour derived from odontogenic epithelium with mature, fibrous stroma without odontogenic ectomesenchyme (Barnes *et al*, 2005) impacted the prevalence of OT. The prevalence of OKC varies from 11.6% to 19.1% (Ochsenius *et al*, 2002, 2007; Meningaud *et al*, 2006; González-Alva *et al*, 2008). In the present report, the prevalence of OKC from 1981 to 2004 was 19.1% and this OC occupied the 3rd place in the frequency distribution of all OC. These data agree with the previous one reported on Mexicans and other populations (Mosqueda Taylor *et al*, 2002; Jones *et al*, 2006; Habibi *et al*, 2007).

Although it has recently been suggested that ameloblastoma is the most frequent OT (Ledesma-Montes *et al*, 2007), it has been established that a distinct geographic variation of OT exists (Sriram and Shetty, 2008). However, it is not known if the geographical variation will be conserved when KOCT is included in the epidemiological studies of OT. In Asia, including India, the most frequent OT is the ameloblastoma, followed by adenomatoid OT and by odontogenic myxomas (Odukoya, 1995; Lu *et al*, 1998; Okada *et al*, 2007; Sriram and Shetty, 2008). In Americans, including Mexicans, the most common OT is odontoma followed by the ameloblastoma and odontogenic myxoma (Daley *et al*, 1994; Mosqueda-Taylor *et al*, 1997; Buchner *et al*, 2006; Guerrisi *et al*, 2007). In the present report, from 1981 to 2004 we obtained a prevalence of OT of 2.6%, and the same frequency distribution: odontoma was the most frequent OT, followed by ameloblastoma; and odontogenic myxoma. However, the distribution changes radically from 2005 onwards. When the KCOT was included into OT, they displaced to Odontoma to

Table 2 Frequency distribution of odontogenic cysts and odontogenic tumours in a Mexican sample in regard to different classifications

		1981–2004 $N = 12\,729$, n (%)	*2005–2007* $N = 2\,706$, *N* (%)
Odontogenic cyts	Total	1113 (100)	209 (100)
	Radicular	503 (45.1)	119 (56.9)
	Dentigerous	385 (34.5)	90 (43)
	OKC	213 (19.1)	–
	Paradental	8 (0.7)	2 (0.9)
	Gingival	3 (0.2)	–
	GOC	1 (0.08)	–
Odontogenic tumours	Total	342 (100)	136 (100)
	Odontoma	154 (45)	42 (30.8)
	Ameloblastoma	76 (22.2)	25 (18.3)
	Odontogenic myxoma	51 (14.9)	8 (5.8)
	AOT	23 (6.7)	2 (1.4)
	Odontogenic fibroma	20 (5.8)	2 (1.4)
	CEOT	3 (0.8)	2 (1.4)
	Cementoblastoma	2 (0.5)	–
	KCOT	–	53 (38.9)

n, number of biopsies; *N*, number of cases; %, frequency distribution; OKC, odontogenic keratocystic; GOC, glandular odontogenic cyst; AOT, adenomatoid odontogenic tumour; CCOT, calcifying cystic odontogenic tumour; CEOT, calcifying epithelial odontogenic tumour; KCOT, keratocystic odontogenic tumour.

Table 1 Prevalence of odontogenic tumours and odontogenic cysts in regard to gender in two different time periods

	No. biopsies			*Odontogenic tumors*			*Odontogenic cysts*		
Years	*Total*	♀	♂	*Total (%)*	♀ *(%)*	♂ *(%)*	*Total (%)*	♀ *(%)*	♂ *(%)*
1981–2004	12 729	7957	4772	342 (2.6)	212 (2.6)	130 (2.7)	1113 (8.7)	576 (7.2)	537 (11.2)
2005–2008	2706	1734	972	136 (5)	83 (4.7)	53 (5.4)	209 (7.7)	96 (5.5)	113 (11.6)
Total	15 435	9691	5744	478 (3.1)	295 (3)	183 (3.1)	1322 (8.5)	672 (6.9)	650 (11.3)

Females, (♀); males, (♂); prevalence, (%).

the 2nd place and now the most frequent OT is the KCOT. These data agree with very recent reports on Chinese and Libyan population (Luo and Li, 2008; El-Gehani *et al*, 2009). In these particular populations, the most frequent OT is KCOT (Luo and Li, 2008; El-Gehani *et al*, 2009). These data suggest that the amount of OKC could be enough to modify the prevalence of the OT and therefore the KCOT will occupy a preponderant place in the prevalence of OT.

Our data suggest that the redefinition and the reclassification of KOCT modified the prevalence and frequency distribution of OT. KCOT has a lightly male predominance, it is most frequent in the third decade of life and the mandible is the site of occurrence (González-Alva *et al*, 2008). This epidemiological profile of KOCT could modify the epidemiological profile of OT. We observed an increase in the prevalence of OT in males in the period 2005–2008. If this increase is related to KCOT should be established. A research protocol designed ex-profeso will be necessary to clarify this important issue.

In a Chinese series, the amount of OT without KOCT was 1054 while they increased to 1642 when KOCT was included (Jing *et al*, 2007). These data mean a 55.7% increase (Jing *et al*, 2007). We obtained an increase of 92% when KOCT was included as OT. In our opinion, this finding should be taken cautiously because it is result of a reclassification and not associated with a real increment in the cases of OT. The report of an increase of 92% in a period of time of 4 years in a very specific and uncommon neoplasias could be misunderstood by health carriers, specifically the managers of the preventive programmes of oral public health and to influence strategies of prevention. The oral pathologist should be awakened to this situation to clarify any misunderstanding in this issue.

Author contributions

Dr Luis A Gaitán-Cepeda was the coordinator of the research teams, Drs Daniel Quezada-Rivera and Fernando Tenorio-Rocha reviewed the cases and Dr Elba and Leyva-Huerta did the statistical analysis.

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Trends in frequency and prevalence of oral cancer and oral squamous cell carcinoma in Mexicans. A 20 years retrospective study

Luis-Alberto Gaitán-Cepeda, Adriana-Graciela Peniche-Becerra, Daniel Quezada-Rivera

Oral Pathology Laboratory, Postgraduate and Research Division, Dental School, National Autonomous University of México

Correspondence:
Laboratorio de Patología Oral,
División de Estudios de Postgrado e Investigación,
Facultad de Odontología, UNAM.
Circuito Institutos, s/n, Ciudad Universitaria,
Coyoacán, 04510, México, D.F. México.
lgaitan@servidor.unam.mx

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Abstract

Objective. To establish the time trends of the frequency and prevalence of oral cavity cancer in regard to age and gender in a 20-years (time period 1989 – 2008) cohort of Mexicans. Design and Setting. 13,235 head and neck biopsies from the archive of the Oral Pathology Laboratory, Dental School, National Autonomous University of Mexico were revised. The cases with diagnoses of oral cancer were selected. Gender and age at diagnosis was obtained from medical records. The frequency and prevalence of oral cavity cancer and oral squamous cell carcinoma were assessed biannually in regard to the total number of population served by the oral pathology laboratory. The statistical significance of trends was established using the linear logistic regression (curve estimation) test (s 0.05). Results. 298 cases (138 males; 160 females) of oral cancer were included; 167 (92 females; 75 males; female:male ratio: 1.1:1) corresponded to oral squamous cell carcinoma. From 1989 to 2008 the prevalence of oral cancer and oral squamous cell carcinoma increased 200% (s 0.05) and 100% (s 0.000) respectively. The increase of frequency and prevalence was observed in both genders however only in females was significant (s 0.000). We do not identify changes in the age at diagnosis. Conclusions. Oral cancer, specifically oral squamous cell carcinoma, has increase in Mexicans females in the last 20 years.

Key words: *Oral cancer, squamous cell carcinoma, demographics characteristics, trends, Mexicans.*

Introduction

An increase in the people less than 40 years suffering cancer, including the oral cavity cancer (OCC) has been reported in the last decade (1). Even more, the presence of oral squamous cell carcinoma (OSCC) in young people without a history of exposure to carcinogenic risks factors has been reported (2, 3). However scientific literature about if Latin-American people shows similar demographical behavior is scarce. To contribute to better knowledge of this important issue the principal objective of this report was to establish the time trend of the frequency and the prevalence of OCC and OSCC in regard to age at moment of diagnosis and gender in a 20-years Mexican cohort .

Materials and Methods

The archive of the Oral Pathology Laboratory of the Dental School, National Autonomous University of México was revised from January 1989 to December 2008. The cases with diagnosis of OCC were identified and selected. Only the cases with histological slides and/or sufficient biological material embedded in paraffin to be cut at 5µ and stained with Hematoxylin – Eosin technique were included. The histological slides of the selected cases were observed by two experts in head and neck malignancies (LAGC, DQR) to confirm their diagnostic or be re-diagnosed. All cases with a confirmed diagnosis of OCC and OSCC were selected.

The gender and age at diagnoses were obtained from medical records. Metastatic tumors were excluded. The biannual distribution frequency of OCC and OSCC in each gender was obtained. The prevalence was established in regard to the population that is served by the oral pathology laboratory. The oral pathology laboratory is the only service at the Dental school of the National Autonomous University of México that offers histopathological diagnosis of head and neck lesions. Therefore all the suspicious cases (clinical or biopsies) of oral disease or oral lesions are referred to our oral pathology service to be diagnosed. In consequence the prevalence of OCC and OSCC were established as follows: prevalence = number of cases/total patients served at dental school x100 (%). The total of patients annually attended was obtained from the archives of the Dental school and from the university yearbook (4). The mean of the age of the patients suffering OCC and OSCC was assessed biannually. The trend of frequency and prevalence of OCC and OSCC as soon as the mean of the age at moment of diagnosis in regard to gender was assessed using a logistic lineal regression (temporal curve) test (s <0.05) (SPSS 13.0® software, Chicago, USA).

Results

From January 1989 to December 2008 our oral pathology service processed 13,235 head and neck biopsies (age mean 35 years; Standard Deviation [SD] ±4). 298 (2.25%) cases (138 males, age mean 55.6 SD ±10.8; 160 females, age mean 54.4 SD ±6.2) were OCC. A trend towards increase the frequency of OCC was observes; from 10 cases in 1898-1990 to 37 cases in 2007-2008. This means an increase of 270% (s 0.007). This trend to increase was observes in both genders (Table 1) however only in females was significant (s 0.001). In the

Table 1. Demographical data of a cohort of Mexicans (1989 – 2008) suffering oral cancer and oral squamous cell carcinoma.

YEAR	PATIENTS*			CASES OF ORAL CANCER			CASES OF OSCC		
	TOTAL	♀	♂	TOTAL	♀	♂	TOTAL	♀	♂
1989-1990	47,750	28,650	19,100	10	6 (50.8)	4 (58.5)	6	4 (56)	2 (60.5)
1991-1992	53,814	32,288	21,526	17	7 (59.1)	10 (54.9)	11	4 (58.1)	7 (66.5)
1993-1994	68,947	41,368	27,579	24	11 (47.3)	13 (52.3)	14	7 (51.2)	7 (62.6)
1995-1996	80,813	48,487	32,326	14	8 (60.8)	6 (53.2)	5	3 (57.5)	2 (61)
1997-1998	99,469	59,681	39,788	31	15 (50)	16 (48.8)	29	14 (55.5)	15 (58.9)
1999-2000	47,853	28,711	19,142	16	12 (56.5)	4 (74)	9	7 (51.7)	2 (77.5)
2001-2002	65,505	38,154	25,436	52	27 (55.1)	25 (56.9)	28	17 (60.1)	11 (55.9)
2003-2004	63,590	38,154	25,436	51	22 (40)	29 (53.6)	26	12 (62.5)	14 (57)
2005-2660	55,683	33,409	22,274	46	30 (58.8)	16 (47.5)	24	14 (67.4)	10 (47.6)
2007-2880	54,058	32,434	21,624	37	22 (62.2)	15 (56.7)	15	10 (79.1)	5 (65.6)
TOTAL	637,482	385,760	251,722	298	160 (54.4)	138 (55.6)	167	92 (59.9)	75 (61.3)

*= TOTAL OF PATIENTS ATTENDING IN THE DENTAL CLINICS OF THE DENTAL SCHOOL, NATIONAL AUTONOMOUS UNIVERSITY OF MÉXICO (Ref 4); OSCC= ORAL SQUAMOUS CARCINOMA CELL OF THE ORAL CAVITY; ( ) = MEAN OF THE AGE AT DIAGNOSIS IN YEARS; ♀ = FEMALES; ♂= MALES.

same period of time (January 1989 to December 2008) were attending 637,482 patients in the dental clinics of the Dental School, therefore the prevalence of OCC was 0.04%. The prevalence of OCC increases 200% from 0.02% in 1989-1990 to 0.6% in 2007-2008 (s 0.01). The trend to increase was significant in both genders: females s 0.004; males s 0.04 (Figure 1 and Table 2). In regard to the age at diagnoses, females increase from 50.8 in 1989-1990 to 62.2 years in 2007-2008. On the other hand the mean of the age in males diminish from 58.5 in 1989-1990 to 56.7 years in 2007-2008. In both cases the trend was not significant.

There were 167 cases of OSCC (92 females; 75 males; female:male ratio: 1.1:1). The cumulative cases of OSCC from 1989 to 1998 were 65; whereas from 1999 to 2008 were 102 cases (Table 1). It represents an increase of 56.9% in 10 years (s 0.09). The time trend towards to increase the number of cases of OSCC was significant in females (s 0.02). The prevalence of OSCC in 1989-1990 was 0.01%; in 1993-1994 was 0.02%; in 2001-2002 was 0.04% and in 2007-2008 was 0.02%. This data represents an increase of 100% (Table 2 and figure 2). In spite of the increase was observes in both genders, only in females was significant (s 0.000).

The females suffering OSCC had a mean of the age at diagnosis of 58.4 years while in the males was 52.0. The women suffering OSCC showed a trend toward increase the age at moment of diagnosis: from 56 years in 1989 – 1990 to 79.1 in 2007 - 2008; an increase of 23 years (s 0.1). The age of male patients suffering OSCC slightly increase, from 60.5 years old in 1989 - 1990 to 65.6 in 2007 – 2008; this trend was not significant (s 0.467).

Table 2. Prevalence per year of cases of cancer of the oral cavity and cases of squamous cell carcinoma of the oral cavity in a cohort of Mexicans.

YEAR	PREVALENCE OF ORAL CANCER			PREVALENCE OF OSCC		
	%			%		
	TOTAL	♀	♂	TOTAL	♀	♂
1989 - 1990	0.02	0.02	0.02	0.01	0.01	0.01
1991 – 1992	0.03	0.02	0.04	0.02	0.01	0.02
1993 – 1994	0.03	0.02	0.04	0.02	0.01	0.02
1995 - 1996	0.01	0.01	0.01	0.006	0.006	0.006
1997 - 1998	0.03	0.02	0.04	0.02	0.02	0.03
1999 - 2000	0.03	0.04	0.02	0.01	0.02	0.01
2001 - 2002	0.07	0.06	0.1	0.04	0.03	0.04
2003 - 2004	0.08	0.08	0.07	0.04	0.03	0.05
2005 - 2006	0.08	0.08	0.07	0.04	0.04	0.04
2007 - 2008	0.06	0.06	0.06	0.02	0.03	0.02
TOTAL	0.04	0.04	0.05	0.02	0.02	0.02

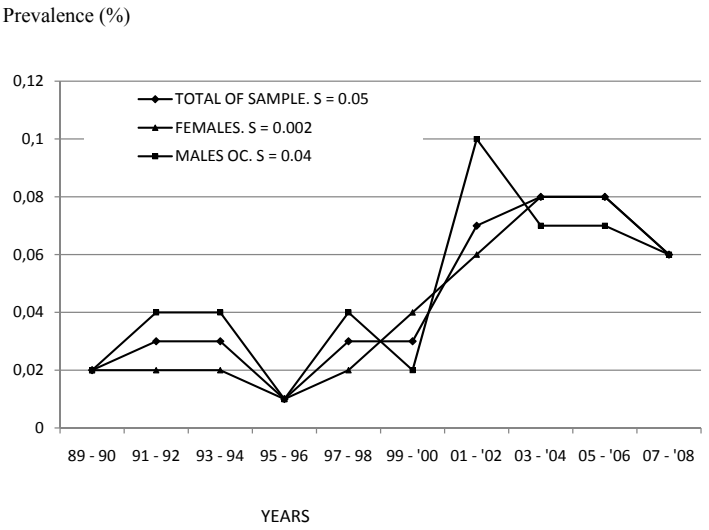

Fig. 1. Trends of the prevalence of oral cancer in a Mexican cohort (1989 - 2008). S = linear regression significance.

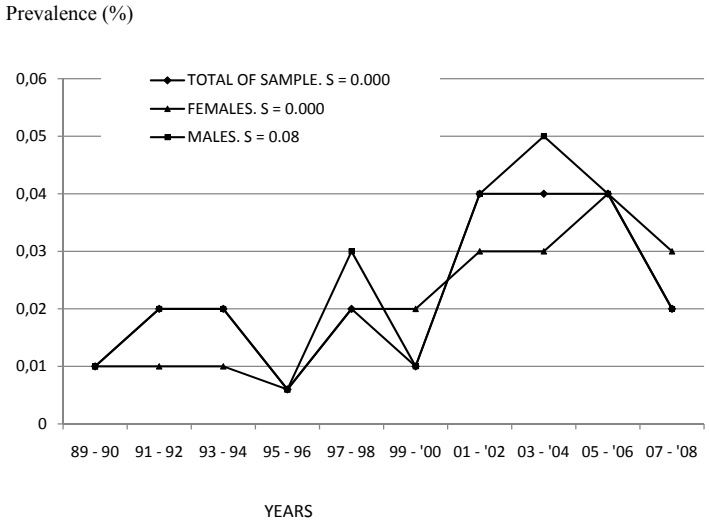

Fig. 2. Trends of the prevalence of oral squamous cell carcinoma in a Mexican cohort (1989 - 2008).
S = linear regression significance.

Discussion

The oral cancer represents 5% of all malignancies of whole body (5). However the frequency and prevalence of OCC varies in regard to social; demographical and geographical characteristics, e.g.: In southeast of Asia, including India, OCC is the most frequent type of cancer (6) while in Europe is engaged in the third place in frequency (7). In Mexico the epidemiological information regard OCC is scarce. The Oral Pathology Laboratory of the Dental School, National Autonomous University of México has a collection of approximately 40,000 head and neck biological samples collected over the last 40 years. It is considered as a national referral center for oral pathology. The attendance area of oral pathology laboratory is from Dental School of the National Autonomous University of Mexico. The teaching dental clinics of the Dental School offer more than 150,000 dental treatments annually and are considered as the most important dental service to open population in Mexico City. The population that is attending in the dental clinics is representative of the Mexico City population.

The incidence rate of OCC is arousing principally in females (5) closely related to the increase in the smoking habit by women. Our findings showed that the prevalence of OCC increased in the last decade, principally in

females. The increase of OCC observed in the present report could have several explanations. It could reflect the increase in the number of Mexicans during the same period of time. The Mexican population growth from 81 millions of inhabitants in 1990 to 106.7 millions in 2008 (8). On the other hand, the increase could be a consequence of a major diffusion of health education programs towards general practice dentists to identify oral lesions suspected of malignancy. Another putative explanation could involve the risk factors for carcinogenesis. The most important risk factors for develops OSCC are smoking and chronic alcoholism (9 - 11). 75% of all OSCC are related to one or both carcinogenic factors (12, 13). An increase in the consumption of tobacco and alcohol in young Mexicans has been reported (11, 14 - 16). The perception of Mexican youth about smoking is like a normal and socially acceptable behavior (16). An early exposure to tobacco and alcohol beverages due to a more permissive environment could be related to the increase of OSCC, specifically in females.

Recently a close relation between OSCC and human papilloma virus (HPV) infection has been reported (13, 17). To confirm if the HPV oral infection is related to the increase in the number of cases of OSCC identified in this report is necessary a research protocol designed ex-professo.

The demographical profiles of patients suffering OSCC have been well established, including a male predominance (7). The male:female ratio in the United States of America is 2:1 (5), while in Spain it is 7:1 (7). Previously it had been reported a male:female ratio 2:1 in Mexicans suffering OCC (13). Our results show a slightly female predominance (male:female ratio 1:1.1). If the trend toward increase of OSCC female cases continues, it is possible to suggest that in Mexicans more females than males will suffer OSCC in the next decades.

The relative risk to suffer cancer increases in relation to age. However an increase of people under 40 years old (with or without exposition to carcinogenic risk factors) suffering OSCC, has been reported in recent years (1, 2). If the cases of oral cancer in youth are isolated cases or if they are the consequence of a change in the demographical profiles it is not known. Our results did not show a time trend towards decrease the age at diagnoses. The mean age at diagnoses in Mexican females was 58 years very similar to reported to Brazilian women: 60.7 years old (11).

Due México is a developing country the optimization of the health institutions focused in the attention of oncologic patients is required. In México, the number of death attributed to oral cancer from 1979 to 2003 was 15,579 (18), therefore oral cancer is considered a public health problem. Our findings support the need to establish policies to prevent the exposition to risk factors of young people and concomitantly to establish programs specifically designed to the early identification of oral lesions suspected of malignancy. The general practice dentist should be awake of the possibility of identify OSCC in population that traditionally was not considered as high risk population to suffer oral cancer.

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Gingival melanoacanthoma: Case report and discussion of its clinical relevance

Jose Luis Tapia, DDS, MS[1]/Daniel Quezada, DDS[2]/
Luis Gaitan, DDS, MS, PhD[3]/Juan C. Hernandez, DDS, MS, PhD[4]/
Carlos Paez, MD[5]/Alfredo Aguirre DDS, MS[6]

Oral melanoacanthoma is an uncommon reactive condition that appears as a solitary pigmented lesion and is most often found on the buccal mucosa. For it to appear in the gingiva is extremely rare—only 11 cases are reported in the literature. This article presents a case of gingival melanoacanthoma and reviews the previously published cases. Because gingival melanoacanthoma shares clinical features with other pigmented lesions with diverse genesis, the differential diagnosis of a solitary pigmented lesion on the gingiva is also discussed. *(Quintessence Int 2011;42:xxx–xxx)*

Key words: amalgam tattoo, gingiva, melanoacanthoma, melanoma, pigmented lesion, smoking- or drug-induced pigmentation

Melanoacanthoma is a rare benign pigmented skin lesion that demonstrates hyperplasia of keratinocytes and melanocytes. It was first described by Blocher in 1927[1] and named melanoacanthoma by Mishima and Pinkus.[2] Cutaneous melanoacanthoma is considered a reactive phenomenon to local irritation or trauma. It appears as a slow-growing, solitary, pigmented, verrucous, round or oval plaque with a diameter ranging from a few millimeters to 10 centimeters. It is generally found in the head and neck area in older Caucasians. Clinically, melanoacanthoma resembles seborrheic keratosis and melanoma. In fact, some investigators consider cutaneous melanoacanthoma a variant of seborrheic keratosis.[3]

A lesion in the oral mucosa with histologic features similar to those of melanoacanthoma of the skin has been reported.[4] However, it seems likely that oral melanoacanthoma and melanoacanthoma of the skin represent different entities.[5] This contention is based on the demographics and clinical course of the populations affected. While melanoacanthoma of the skin never involutes, oral melanoacanthoma may regress, especially after an incisional biopsy. In addition, cutaneous involutes occur in mainly light-skinned older adults, while oral melanoacanthoma has a predilection for younger African-Americans.

Oral melanoacanthoma is an uncommon reactive lesion with predilection for African-American women, usually in their third to fourth decades of life, that shows a rapid increase in size that reaches several centimeters in diameter within a period of few weeks.[1,5,6] Oral melanoacanthoma typically presents as a solitary pigmented lesion on the buccal mucosa[1]; however, bilateral and multifocal lesions have been reported.[4]

[1]Assistant Professor, Department of Oral Diagnostic Sciences, School of Dental Medicine, State University of New York at Buffalo, Buffalo, New York, USA.

[2]Director, Oral Pathology Biopsy Service, Faculty of Odontology, National Autonomous University of Mexico, Mexico City, Mexico.

[3]Director, Oral Pathology Laboratory, Faculty of the Odontology, National Autonomous University of Mexico, Mexico City, Mexico.

[4]Director, Immunology Laboratory, Faculty of the Odontology, National Autonomous University of Mexico, Mexico City, Mexico.

[5]Attending Pathologist, Pathology Department, Hospital General 20 de Noviembre, Mexico City, Mexico.

[6]Director, Advanced Oral and Maxillofacial Pathology Program, and Professor, Department of Oral Diagnostic Sciences, School of Dental Medicine, State University of New York at Buffalo, Buffalo, New York, USA.

Correspondence: Dr Jose Luis Tapia, School of Dental Medicine, State University of New York at Buffalo, 355 Squire Hall, Buffalo, NY 14214. Email: jltapia2@buffalo.edu

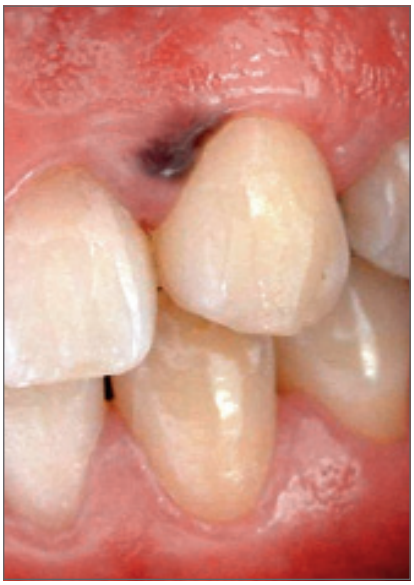

Fig 1 Solitary pigmented gingival lesion of 2 weeks' duration.

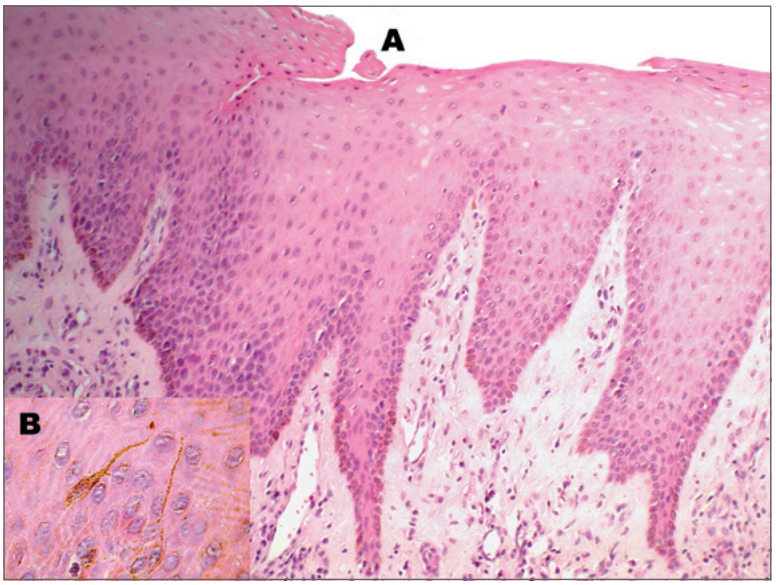

Fig 2 *(a)* Photomicrograph showing epithelial acanthosis, mild spongiosis, and melanocytes along the basal cell layer and dispersed throughout the spinous cell layer (hematoxylin-eosin, original magnification × 200). *(b)* High power photomicrograph showing denditric melanocytes within the spinous cell layer (hematoxylin-eosin, original magnification × 400).

Although oral melanoacanthoma is usually asymptomatic, pain, burning, and pruritus have been reported,[7] and regression (a feature never seen in cutaneous melanoacanthoma) has been documented.[8] Because of the similarities between cutaneous and oral melanoacanthoma at the microscopic level and their dissimilar biologic behavior, Tomich and Zunt[8] suggested the term *melanoacanthosis* to differentiate between the two.

Oral melanoacanthoma usually occurs on the buccal mucosa. The gingiva is an uncommon location[7]—only 11 cases have been reported.[1,5,7,9–15] In this report, we present an additional case of gingival melanoacanthoma and discuss the differential diagnosis of solitary pigmented lesions on the gingiva.

CASE REPORT

A 35-year-old white woman came to the Oral Pathology Clinic, Faculty of Odontology, National Autonomous University of Mexico, for the evaluation of a pigmented lesion on her maxillary gingiva. The patient related that she first noticed the pigmented lesion approximately 2 weeks prior. She reported a history of cutaneous pruritic pigmented lesions that had been successfully treated with retinol. The skin lesions had not been biopsed, and a clinical diagnosis was not available. Extraoral examination was noncontributory. Intraoral examination revealed the presence of a solitary, irregularly pigmented brown macule on the maxillary gingiva adjacent to the left canine (Fig 1). The macule measured 0.6 × 0.3 cm.

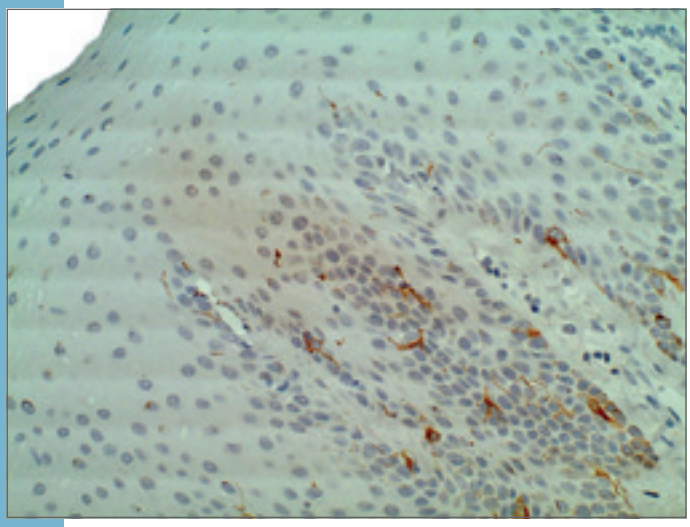

Fig 3 Photomicrograph demonstrating strong immunorecativity of dendritic melanocytes to HMB-45 (HMB-45 immunostain, original magnification × 200).

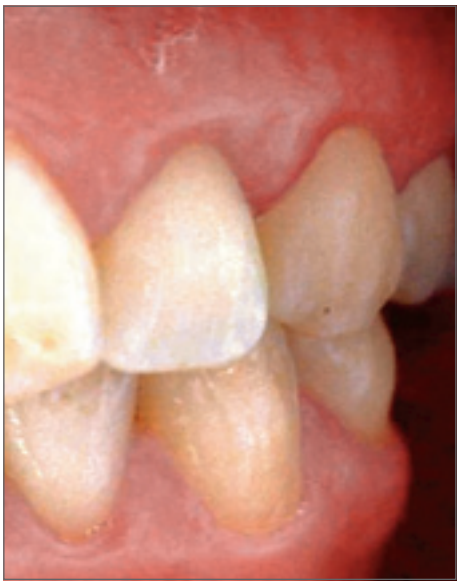

Fig 4 Follow-up of the patient after 6 months. There was no evidence of recurrence.

The differential diagnosis included oral melanotic macule, melanocytic nevus, amalgam tattoo, and melanoma. An excisional biopsy was performed; the specimen was fixed in 10% buffered formalin and then bisected and submitted in toto for embedding. Paraffin-embedded sections 5-μm thick were stained with hematoxylin-eosin. Histologic examination revealed a specimen consisting of stratified squamous epithelium and subjacent fibrous connective tissue. The epithelium showed a thin layer of parakeratin, conspicuous acanthosis, and pigmented denditric melanocytes extending from the basal cell layer to the upper spinous cell layers (Figs 2a and 2b). Immunohistochemical examination with the HMB-45 probe showed a strong signal of dendritic and nondendritic melanocytes residing in the basal, parabasal, and spinous cell layers (Fig 3). A diagnosis of oral melanoacanthoma of the gingiva was rendered. Healing of the biopsy site was uneventful, and no recurrence was noted at the 6-month follow-up (Fig 4).

DISCUSSION

The gingiva is an uncommon location for oral melanoacanthoma. This case represents the twelfth gingival oral melanoacanthoma reported in the English literature. The clinical features of these cases are summarized in Table 1.

Table 1 Gingival melanoacanthomas in the literature

Authors	Year	Sex	Race	Age (y)	Location	Number of lesions	Clinical description	Size	Duration
Goode et al[1]	1988	F	African-American	36	Attached gingiva	Single	Brown lesion	0.3 cm	4 wk
Maize[9]	1988	F	African-American	NA	Mandibular gingiva	Lesions on gingiva and labial mucosa	Pigmented macules	NA	NA
Flaitz[10]	2000	F	African-American	40	Mandibular gingiva	Single	Brownish-black plaque	NA	3 wk
Fornatora et al[7]	2003	F	Caucasian	72	Mandibular gingiva	Single	Flat lesion	0.2 cm	< 9 mo
Najjar and Chiodo[15]	2008	NA	NA	NA	Mandibular gingiva	NA	NA	NA	NA
Carlos-Bregni et al[11]	2007	M	Caucasian	07 [au: 70?]	Mandibular gingiva	Single	Pigmented macule	0.3 cm	2 y
Carlos-Bregni et al[11]	2007	F	Hispanic	33	Maxillary gingiva	Single	Dark-brown macule	0.6 cm	2 mo
Yarom[12]	2007	F	Caucasian	60	Maxillary gingiva	Lesions on gingiva and palate	Brown macules	NA	NA
Brooks and Nikitakis[13]	2008	F	African-American	47	Maxillary gingiva	Single	Pigmented macule	0.2 × 0.3 cm	2 mo
Brooks et al[5]	2009	F	Caucasian	NA	Maxillary and mandibular gingiva	Lesions on gingiva and hard palate	Brown macules	0.1 to 0.4 cm	<1 y
Marocchio et al[14]	2009	F	African-American	74	NA	Lesions on gingiva, buccal mucosa, lips, and tongue	Brownish-black macules	NA	NA
Present case	2011	F	Hispanic	60	Maxillary gingiva	Single	Brown macule	0.6 cm	2 wk

NA, not available.

Analysis of the published cases of gingival MA (including our case) revealed that the mean age of patients with this condition is 47.6 years with an age range of 7 to 74 years. A narrower age range is seen in at other intraoral locations (24.0 to 39.4 years [au: ok to add 0 for consistency?]).[1,7] In contrast to oral melanoacanthoma where a definitive African-American predilection is observed,[7] gingival melanoacanthoma is equally distributed between Caucasians and African-Americans. However, like oral melanoacanthoma, gingival melanoacanthoma has a female predilection (more than 90%). Clinically, most of the lesions were described as a brown macules. When reported, the size of the lesions ranged from 0.2 to 0.6 cm in diameter. Most gingival melanoacanthoma represents single lesions (eight out of 12). In two cases, gingival and palatal melanoacanthoma were present (one with a multifocal presentation).[5,12] Two cases presented with gingival and labial melanoacanthoma,[9,14] and one with tongue lesions.[14] A similar number of mandibular and maxillary gingival melanoacanthoma have been reported.

Microscopically, oral melanoacanthoma is characterized by the presence of an acanthotic, stratified squamous epithelium with numerous dendritic melanocytes populating all the epithelial cell layers. The lamina propia may contain an increased number of eosinophils and, at times, a prominent patchy chronic inflammatory cell infiltrate.[1] Immunohistochemical studies of oral melanoacanthoma have demonstrated reactivity of melanocytes to HMB-45, S-100, and Melan-A.[7,11]

Our case showed dendritic and nondendritric melanocytes imunoreactivity to HMB-45, a finding that has been reported in other oral melanoacanthomas. It is important to highlight that this marker cannot segregate oral melanoacanthoma and melanoma.[7]

Because an oral pigmented lesion on the gingival tissue may represent an array of diverse entities with distinct biologic behaviors, a number of pigmented lesions have to be considered in the differential diagnosis. These include amalgam tattoo, oral melanotic macule, smoker's melanosis, drug-induced pigmentation, melanocytic nevus, and melanoma.

The most common pigmented lesion on the gingiva is amalgam tattoo. Oral amalgam tattoos characteristically present as solitary or multiple macules displaying black, blue, or gray discoloration.[16,17] Twenty-eight percent of amalgam tattoos occur on the gingiva, thus representing its most common location. In most cases, the diagnosis of amalgam tattoo is supported by the presence of dental amalgam restorations in adjacent teeth. In addition, radiographs may reveal the presence of radiopaque particles. In cases in which intraoral films document the presence of metallic particles in the soft tissue, no further evaluation is warranted. However, many times, the amalgam particles are too small to be observed on radiographs or the clinical history is unclear. In these cases, a biopsy is indicated to rule out other pigmented lesions.[16]

Oral melanotic macule presents as a solitary black or brown-pigmented well-circumscribed lesion that measures less than 1 cm across. The most common locations are the palate, gingiva, and lower lip. Approximately 80% of oral melanotic macules occur in Caucasians and show a predilection for women after the fourth decade of life. Although this lesion is considered completely innocuous and has no malignant potential, frequent examination is recommended to monitor changes in color, size, and shape.[18]

Smoker's melanosis is a benign dark pigmentation of the oral mucosa that develops in 25% of cigarette smokers. The anterior gingiva and interdental papilla are the most commonly affected sites.[17] These pigmentations may vanish with the cessation of smoking.[17] Persistence of oral pigmentations after smoking cessation would warrant a biopsy.

Several drugs have been reported to produce oral pigmentation. Mynocycline, antimalarials, tranquilizers, oral contraceptives, chemotherapeutic drugs, and drugs used in the management of HIV are capable of triggering oral pigmentation.[17] Drug-induced melanosis can be diffuse and mutifocal[19] and has a predilection for the hard palate and gingiva.[17] Discontinuation of the offending drug usually leads to the resolution of the oral pigmentation.[17]

Nevi of the oral mucosa typically appear as asymptomatic, solitary, well-circumscribed, round or oval lesions with a diameter of less than 1 cm. The color of these lesions may be brown, blue, and black. Occasionally, nevi may lack pigmentation. Eleven and a half percent of oral pigmented nevi arise in gingival tissues. Oral nevi are more frequently diagnosed in Caucasians females. Although they can be found at any age, the highest incidence is seen in the third and fourth decades of life.[20,21]

Cutaneous and mucosal melanomas are malignant tumors that arise from pigment-producing cells residing in either normal-looking tissue or preexisting benign pigmented lesions.[22] Oral melanomas present as irregular, asymptomatic, brown to black macules or as pigmented papules or nodules that rapidly increase in size.[23] One-third of oral melanomas arise on gingiva.[24] Oral melanomas occur most frequently in the fourth through seventh decades of life. Most studies support a greater incidence in men than women.[25] This neoplasm exhibits an aggressive behavior and poor prognosis.[23] Early detection and radical treatment may improve the prognosis of these patients.[26]

Biopsy is indicated for all solitary gingival melanotic lesions because of the proclivity of melanoma to arise on the gingiva. In early stages, gingival melanoma may be indistinguishable from other pigmented lesions. Therefore, it is imperative that any pigmented oral lesion that cannot be attributed to physiologic or iatrogenic origin be excised. In addition, any gingival pigmented lesion with irregular borders, heterogeneous pigmentation, surface elevation, abrupt appearance, and or rapid growth should be biopsied.[5]

SUMMARY

Melanoacanthoma is an uncommon ginigival lesion [au:edit ok?]. Because gingival melanoacanthoma cannot be clinically distinguished from early melanoma, biopsy of pigmented gingival lesions is warranted.

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Tumors of the salivary gland in Mexicans. A retrospective study of 360 cases

Claudia-Patricia Mejía-Velázquez [1], Marco-Antonio Durán-Padilla [2], Erick Gómez-Apo [3], Daniel Quezada-Rivera [4], Luis-Alberto Gaitán-Cepeda [5]

[1] Professor, Dental School, National Autonomous University of Mexico, México
[2] Chief of the surgical pathology service, General Hospital of México, México city, México
[3] 2nd year neuropathology resident, General Hospital of México, México city, México
[4] Chief of the Histopathologic Diagnosis Service, Graduate and Research Division, Dental School, National Autonomous University of Mexico, México
[5] Clinical and Experimental Pathology Laboratory, Graduate and Research Division, Dental School, National Autonomous University of Mexico, México

Correspondence:
Laboratorio de Patología Clínica y Experimental
División de Estudios de Postgrado e Investigación
Facultad de Odontología
Universidad Nacional Autónoma de México
Circuito Institutos s/n, Ciudad Universitaria
Coyoacán 04510, D.F. México
patoidf@yahoo.com.mx

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Abstract

Objective: To establish distribution frequency and demographic characteristics of salivary gland tumours (SGT) in order to identify possible risk profiles.

Design of study: The present report constitutes an eight year retrospective study (January 2000-August 2007). The archives of the Clinical and Experimental Pathology Laboratory (Graduate and Research Division, Dental School, National Autonomous University of Mexico) as well as archives of the Surgical Pathology Service (General Hospital, Mexico City) were subject to revision in order to select all cases where SGT tumour diagnoses were emitted. Age and gender of patients as well as SGT topography were obtained from medical records. Selected cases were classified according to location of the lesion, histological lineage and biological behaviour.

Results: 360 cases of SGT were included, 227 (67%) cases were benign tumours, while 83 cases (23%) were malignant tumours. SGT were most frequent in women with ages ranging from their 3rd to 5th decades of life. 275 tumours were located in major salivary glands, 78.9% of them were identified in the parotid gland. The most frequent location of tumours arising from minor salivary glands (33 cases, 38%) was found in the palatine glands. Tumours of epithelial lineage were the predominant histological type. The most frequent benign tumours were pleomorphic adenomas (86.1%) and papillary cystadenoma lymphomatosum (7.3%). The most frequent malignant tumours were adenoid cystic carcinomas (25%) and mucoepidermoid carcinomas (23.6%)

Conclusions: Salivary gland tumours in Mexican population appear principally in major salivary glands of women in their 3rd to 5th decade of life.

Key words: *Salivary glands tumours, epithelial tumours, pleomorphic adenoma, papillary cistadenoma lymphomatosum, adenoid cystic carcinoma, mucoepidermoid carcinoma.*

Introduction

Salivary gland tumours (SGT) are uncommon entities that amount to 3% to 10% of all head and neck neoplasms (1). This low incidence could be related to racial and geographical factors. The age-adjusted annual incidence is 4.7 % for benign SGT cases and 0.9 % for malignant ones (2). SGT have preference for women in their 3rd to 5th decades of life (3-12). 50% of all SGT are benign, more than half of these arise from major salivary glands, 64 to 80% of them in the parotid gland (4). When defining histological type, the most frequent variety are the pleomorphic adenomas (PA) for benign tumours, and mucoepidermoid carcinomas for malignant ones (4-7, 10-12).Tumours that originate in minor salivary glands represent 10 to 25% of all SGT. The majority of these tumours are malignant (50-60%), and mucoepidermoid carcinoma and cystic adenoid carcinoma are the most frequent (1,13-19).

Since scientific information (1-23) related to this issue is scarce, topographical and frequency distribution as well as demographic characteristics of SGT are unknown for Latin American in general as well as in particular for the Mexican population. This research aims at contributing to the identification of risk profiles through the establishment of demographic characteristics of patients afflicted with SGT.

Materials and Methods

Records dated from January 2000 to August 2007 of the Laboratory of Clinical and Experimental Pathology, Graduate and Research Division, Dental School, National Autonomous University of Mexico and of the Surgical Pathology Service of the General Hospital of Mexico City were examined to identify and select all cases of diagnosed salivary gland (major or minor) tumours. Age and gender of patients and location of lesions were obtained from medical records. Cases with sufficient biological material embedded in paraffin or histological slides stained with Hematoxylin and Eosin technique were reviewed by two pathologists (CPMV/MADP) to confirm diagnosis, or to re-diagnose and classify the cases following criteria proposed by the World Health Organization in 2005 for salivary gland tumours. Additionally, cases were grouped according to their behaviour (benign or malignant), histogenesis (epithelial, lymphoid and mesenchymal) and topography/location (major or minor salivary glands).

An *ex professo* database was achieved using the software programme SPSS 16.0®. Data on frequency of tumours with respect to age and gender of patients, location, and histogenesis were obtained.

Results

169,051 files from the Surgery Pathology Service of the General Hospital of Mexico City were examined. Out of these, 471 cases with diagnoses of SGT were identified. From these 471 identified cases, 152 were discarded due to lack of sufficient biological material or histological slides stained with Hematoxylin and Eosine technique, or because the diagnosis did not correspond with that of a primary tumour of the salivary glands. 319 cases were then included in the present study. Additionally, 6,548 files from the records of Laboratory of Clinical and Experimental Pathology, Graduate and Research Division, School of Dentistry, National Autonomous University of Mexico were examined. Out of these, 53 cases with SGT diagnosis were identified and selected. 12 cases were discarded for reasons similar to the aforementioned, and 41 cases of SGT were included. From this point onwards, and for logistics reasons, both case series were combined to form a single database of 360 cases. From the total sample (n=360), 230 cases were women (average age 41.9 years; standard deviation [SD] ±16.2) and 130 were men (average age 42.1 (SD ±17.4). Age range of all samples was 11-93 years with an average of 42 years (SD ±16.6). Graph 1 shows age distribution of all cases.

Out of these 360 cases, 76.3% were located in major salivary glands while 64 cases (17.7%) were found in minor salivary glands. In 21 cases, location was impossible to establish. The most common location of the major SGT was the parotid gland (78%) followed by the submandibular gland with 20.7%. Only one case was identified in the sublingual gland. With respect to minor SGT, the palatine gland was the most frequent location, percentage being 51.5% (33 cases). The lip followed in location frequency with 10 cases, then the tongue with 5 cases, after this the oral mucosa, with 5 cases, and finally the retromolar area with 3 cases. Table 1 shows the topographical distribution of the total sum of cases.

Behaviour and histological lineage.

277 cases were benign tumours and 83 cases were malignant tumours. 274 benign tumours were of epithelial origin, while 3 were mesenchymal tumours. 72 malignant tumours were of epithelial origin and 11 cases were lymphoid. Table 2 shows total distribution of SGT with respect to their behaviour and histological lineage.

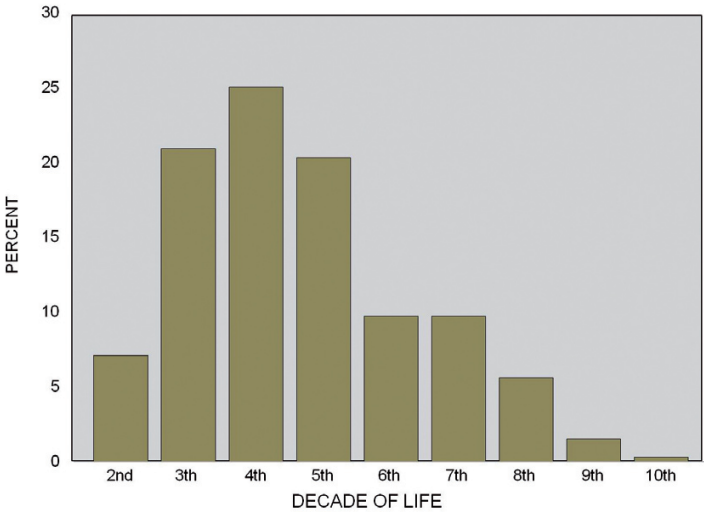

Fig. 1. Age distribution of salivary gland tumors in a mexican population.

-*Epithelial tumours (n= 346)*

Epithelial tumours constituted 96.1% of the whole sample. These tumours showed predilection for patients in their third up to their fifth decade of life. 219 (63.2%) were women, with age average of 41.7 years (SD ±15.8), 127 were men, with age average of 41.9 years (SD ±17.5). In 261 cases tumours were located in major salivary glands, distributed as follows: 206 (78.9%) in the parotid gland, 54 (20.7%) in the submandibular gland, and only one (0.4%) in the sublingual gland. 64 cases were located in the minor salivary glands. Of these, the palate was found to be the most frequent location (Table 3).

274 (79.1%) tumours were benign, with peak of incidence in patients in their fourth decade of life. 176 (64.2%) patients were women and 98 (35.7%) were men. In the 72 (20.8%) remaining cases (43 [59.7%] women; 29 [40.2%] men) the lesions were malignancies, patient age ranging from 17 to 85 years, with predominance of patients in their 5th decade of life.

-*Histological subtype*

-*Benign Tumours*

Pleomorphic adenoma. Pleomorphic adenoma was the most common of the benign tumours, accounting for 236 cases. Mean age at diagnosis time was 39.9 years (SD ±15.3), with female predominance. The most frequent location were the major salivary glands, with 193 cases. The parotid gland was the most frequent site (76.7%), followed by the submandibular gland (22.8%). With respect to the minor salivary glands the palate (53.8%), lip (22.2%) and oral mucosa (8.3%) were the most frequent locations.

Papillary Cystadenoma Lymphomatosum (PCL). The 20 cases of PCL represented 7.3% of all benign epithelial neoplasms. PCL showed an incidence in patients in their 5th and 7th decade. Male-female ratio was 2:1. The parotid gland was the most common site accounting for 80% of cases. 2 cases were found in the submandibular gland, and specific location of two other cases could not be obtained.

Basal cell adenoma. 8 cases (2.9%) of basal cell adenoma were diagnosed. Mean age of patients was 46.5 years (SD ±16.6). The majority of patients were women (62.5%) with a peak of lesions in their 7th decade of life. Six cases were found in the parotid gland. Location of tumours in other cases was unobtainable.

Others. Mioepitheliomas represented 1.5% of all tumours. Average age of patients was 40.75 years (range 22-74, female-male ratio 3:1). With respect to their topography, three cases were found in the palate and one in the parotid gland. Three cases of cystadenoma were identified. Mean age of patients was 40.6 years (SD ±23). All three cases were in the parotid gland of female patients. Oncocytomas represented 0.7% (2 cases) of all SGT. Both cases were located in the parotid gland, one case was found in a 35 year old woman and the other in a 59 year old man. There was only one case of ductal adenoma and it was located in the parotid gland of a 42 year old woman.

-*Malignant tumours*

Adenoid cystic carcinoma (ACC). ACC constituted 25% of all epithelial malignancies. ACC showed a peak of incidence in patients in their 5th decade of life, without gender predilection. Minor salivary glands were the most frequent site, specifically in the palate and maxillary sinus.

Mucoepidermoid carcinoma. Mucoepidermoid carcinomas rated second in frequency of malignant lesions, accounting for 17 cases. Mucoepidermoid carcinoma was most frequent in women in their 5th decade of life. 64.7% of all mucoepidermoid carcinomas arose from minor salivary glands, the most frequent location being the palate,

followed by lip, tongue, retromolar area and oral mucosa.

Acinar cell carcinoma. 9 cases of acinar cell carcinoma were diagnosed, representing 12.5% of all malignant epithelial tumours. Acinar cell carcinoma was found in patients ranging from 20 to 59 years. A slight predominance of cases in males was observed. All cases examined were found in the parotid gland.

Ex-adenoma pleomorphic carcinoma. This malignant tumour represents 9.7% of all malignancies. Ex adenoma pleomorphic carcinoma was most frequently found in patients in their 4th decade of life. 57.1% of these lesions were found in men, all of them in major salivary glands.

Salivary duct carcinoma. Only 5 cases of salivary duct carcinoma were identified. The tumours were mainly located in the parotid gland and appeared predominantly in male patients with ages ranging from 32 to 72 years.

Lymphoid tumours (n=11)

11 (3.1% of the total SGT sample) lymphoid tumours were identified. These tumours appeared predominantly in females in the 22-72 age bracket (average age 53 years). Nine cases were found in the parotid gland and two in the submandibular gland. Lymphoma of mucous membrane associated lymphoid tissue (MALT) was the most frequent histological subtype (54.5% of all lymphomas), it appeared predominantly in women. All lymphomas were located in the parotid gland. The diffuse large cell B lymphoma constituted 27% of the sample. It showed predilection for women and to be located in the parotid gland. One was found in the submandibular gland. Two cases of follicular lymphoma were diagnosed, one in the parotid gland and one in the submandibular gland. Follicular lymphoma represented 18.2%.

-Mesenchymal tumours (n=3)

Only three mesenchymal tumours were identified. Mesenchymal tumours constituted 8 % of the whole sample. Two cases were hemangiomas, found in the submandibular gland and parotid gland of two women of 15 and 31 years, respectively. The remaining case was a schwannoma located in the parotid gland of a 20 year old woman.

Table 1. Gender distribution of major and minor salivary gland tumors.

Salivary gland	Localization	Gender	
		Female	Male
	Unknown	11	10
Major (n = 275)	Parotid (n = 217)	146 (67.2%)	71 (32.7%)
	Submandibular (n = 57)	34 (59.6%)	23 (40.3%)
	Sublingual (n = 1)	1	0
Minor (n = 64)	Palate (n = 33)	22 (66.6%)	11 (33.3%)
	Lip (n = 10)	4 (40%)	6 (60%)
	Tongue (n = 5)	2 (40%)	3 (60%)
	Retromolar area (n = 3)	3 (100%)	0
	Maxillary sinus (n = 2)	2 (100%)	0
	Oral mucosa (n = 5)	2 (40%)	3 (60%)
	Others (n = 6)	3 (50%)	3 (50%)

Table 2. Gender distribution and biological behavior.

		Gender	
		Female	**Male**
Biological behavior	Benign (n = 277)	179 (64.6%)	98 (35.3%)
	Malignant (n = 83)	51 (61.4%)	32 (37.2%)
Histological lineage	Epithelial (n = 346)	219 (63.2%)	127 (36.7%)
	Mesenchymal (n = 3)	3 (100%)	0
	Lymphoid (n = 11)	8 (72.7%)	3 (27.2%)

Table 3. Gender distribution and histological subtype.

Histological lineage	**Histological subtype**	**Gender**	
		Female	**Male**
Mesenchymal tumors	Hemangioma	2	
	Schwannoma	1	
Lymphoid tumors	Malt lymphoma	5	1
	Large b-cell diffuse lymphoma	2	1
	Follicular lymphoma	1	1
Epithelial tumors	Pleomorphic adenoma	157	79
	Basal cell adenoma	5	3
	Canalicular adenoma	1	
	Warthin tumor	6	14
	Oncocytoma	1	1
	Cystadenoma	3	
	Myoepithelioma	3	1
	Mucoepidermoid carcinoma	14	3
	Adenoid cystic carcinoma	9	9
	Acinar cell carcinoma	4	5
	Salivary duct carcinoma	2	3
	Myoepithelial carcinoma	1	2
	Ex-adenoma pleomorphic carcinoma	3	4
	Polymorphous low grade adenocarcinoma	1	1
	Others	9	2

Discussion

This paper describes demographic characteristics of 360 salivary glands tumours, including epithelial, mesenchymal and lymphoid tumours. Our results concur with previous reports with respect to age and gender of patients and location and histogenesis of tumours. Nevertheless, a previous report carried out in Mexican population (20), suggests that the preferred site of SGT is the minor salivary glands. Data gathered in the present research do not concur. A possible explanation for this apparent contradiction could reside in the fact that the archive revised by Ledesma-Montes and Garcés-Ortiz (20) and reviewed once more by the authors of the present study, includes only samples from head and neck services, where the majority of surgical specimens originate from intraoral surgeries. Therefore, the surgical specimens of minor salivary glands are prevalent. This report includes samples gathered from a second level hospital with high national concentration of patients, which would then suggest a more accurate representation of the Mexican population.

In this report, PCL was the second most frequent benign epithelial neoplasia. Male:female ration was 1:2 These findings concur with the report of Ito et al (9). Recently, scientific literature has described an increase in female patients, shifting the male:female ratio to 1:1 (2,11). Ito´s et al report (9) as well as the present one, both carried out in Latin American populations, disagree with the aforementioned suggestion. These apparent discrepancies could be related to smoking habits, which are the main etiological factor for this particular neoplasia. Latin America is experiencing a recent increase in women smokers, it could then be suggested that the next decade will see a shift in trend. It is interesting to point out that two PCL cases were diagnosed in the submandibular gland, since it is known that this neoplasia is almost exclusive of the parotid gland. (2,4,9-11). In both cases, the medical file did not provide sufficient clinical data to rule out an extension of primary tumour from the parotid gland. Cases of PLC arising from the minor salivary glands have been reported (19,20).

In this study, the highest prevalence of malignant epithelial tumours was observed in patients in the 5th decade of life which concurs with the report of Ledesma-Montes and Garcés Ortiz (20). It should be noted that both studies show lesser prevalence of malignant epithelial tumours than other studies described in scientific literature. A peak of prevalence of these lesions in patients in their 6th-7th decade of life has been reported (1,5,9,10,13,17,19). A fact to be noted is that mucoepidermoid carcinoma showed predilection for minor salivary glands, which disagrees with other reports in the scientific literature (4-7,9,11,12). In theses cases, women were strong favourites, (female:male ratio 7:1) To this date, no explanation has been found to justify this ratio. Al Khaleeb et al (11) informed of a similar association.

The greater part of published SGT series are restricted to epithelial tumours. Few reports included non-lymphoid mesenchymal tumours (9-11).This report studied three mesenchymal cases, which corresponds to 0.8% of the total sample. This figure is slightly under the reported ratio of 1 to 2% (9-11). The cases studied in this report were two hemangiomas and one schwannoma. The latter is considered one of the most frequent tumours along with lipoma, neurofibroma and lymphangioma (9-11,24-26). With respect to lymphoid tumours, the most frequent histological kind encountered was the cell B non-Hodgkin lymphoma. All of them were located in major salivary glands, mainly in female patients. With respect to the histological subtype of lymphomas, and in accordance with other findings in scientific literature, we observed predominance of extraganglionar marginal zone lymphomas (2,27).

It can be concluded that the present study shows that in Mexican population salivary gland tumours can be found mainly in salivary glands of women in their 3rd to 5th decades of life. Benign epithelial tumours were the most frequent. Malignant tumours were found in younger age brackets than other cases reported in scientific literature. This suggests a change in the demographic profile of salivary gland adenocarcinomas in Mexican population. This suggestion must be corroborated by other research groups. If this confirmation takes place, a research protocol should be devised focusing on the identification of the possible factor which could explain the demographical differences proposed here, including racial or geographical factors.

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