J Bras Patol Med Lab. 2020; 56: 1-5.

10.5935/1676-2444.20200002

Benign neural lesions of the oral and maxillofacial complex: a 48-year-retrospective study

Lesões neurais benignas do complexo bucomaxilofacial: estudo retrospectivo de 48 anos

Liliane Cristina N. Marinho; Hellen B. P. Santos; Everton F. Morais; Roseana A. Freitas

Universidade Federal do Rio Grande do Norte (UFRN), Natal, Rio Grande do Norte, Brazil.

ABSTRACT

Introduction: Peripheral nerve sheath lesions are among the various diseases that can affect the nervous tissue. These neural origin lesions may occur in the maxillofacial region, although they are rare. **Objective:** The aim of this study was to retrospectively evaluate patient's profiles presenting benign neural tumors of the oral and maxillofacial complex and carry out comparisons with previous studies. **Methods:** A descriptive and retrospective study of the clinical records of patients diagnosed with benign oral and maxillofacial neural lesions at the Department of Dentistry of the Universidade Federal do Rio Grande do Norte (UFRN) was carried out, from 1970 to December 2017. **Results:** From a total of 15,527 histopathological records analyzed over 48 years, 57 (0.37%) corresponded to benign neural lesions, of which 24 (42.11%) were neurofibroma, 15 (26.32%) were traumatic neuroma, nine (15.79%) were neurilemoma, three (5.26%) were granular cell tumor, three (5.26%) were congenital epulis, and three (5.26%) were solitary circumscribed neuroma. Three patients (12.5%) with neurofibroma also presented type I neurofibromatosis. Most patients were female (56.66%), ranging in age from three days to 79 years old. **Conclusion:** The data obtained confirmed that lesions of neural origin are uncommon in the oral cavity and that neurofibroma is the most frequent, female are the most affected, and the tongue is the most prevalent affected area.

Key words: neoplasms; mouth; epidemiology.

RESUMO

Introdução: *As lesões nervosas periféricas estão entre as várias doenças que podem afetar o tecido nervoso. Essas lesões de origem neural podem ocorrer na região maxilofacial, embora sejam raras.* ***Objetivo:*** *O objetivo deste estudo foi avaliar retrospectivamente o perfil de pacientes com tumores neurais benignos do complexo bucomaxilofacial e realizar comparações com estudos prévios.* ***Métodos:*** *Trata-se de um estudo retrospectivo e descritivo dos prontuários de pacientes com diagnóstico de lesões benignas neurais bucais e maxilofaciais do Departamento de Odontologia da Universidade Federal do Rio Grande do Norte (UFRN), no período de 1970 a dezembro de 2017.* ***Resultados:*** *Foram analisados 15.527 registros histopatológicos em 48 anos; 57 (0,37%) corresponderam a lesões neurais benignas, sendo 24 (42,11%) neurofibromas, 15 (26,32%) neuromas traumáticos, nove (15,79%) neurilemomas, três (5,26%) compostos por tumores de células granulares, três (5,26%) epúlides congênitas e três (5,26%) neuromas circunscritos solitários. Três pacientes (12,5%) com neurofibroma também apresentaram neurofibromatose tipo I. A maioria dos pacientes era do sexo feminino (56,66%), com idade variando de 3 dias a 79 anos.* ***Conclusão:*** *Os dados obtidos confirmaram que lesões de origem neural são incomuns na cavidade bucal e que os neurofibromas são os mais frequentes, sendo o sexo feminino o mais acometido e a língua o sítio anatômico mais prevalente.*

Unitermos: *neoplasias; boca; epidemiologia.*

First submission on 05/29/19; last submission on 08/20/19; accepted for publication on 08/20/19; published on 01/14/20

RESUMEN

Introducción: *Las lesiones nerviosas periféricas son algunas de las varias enfermedades que pueden afectar el tejido nervioso. Esas lesiones de origen neural pueden ocurrir en la región maxilofacial, aunque sean raras.* ***Objetivo:*** *El objetivo de este estudio fue evaluar retrospectivamente el perfil de pacientes con tumores neurales benignos del complejo oral y maxilofacial y realizar comparaciones con estudios previos.* ***Método:*** *Se trata de un estudio retrospectivo y descriptivo de los historiales de pacientes con diagnóstico de lesiones benignas neurales del área oral y maxilofacial del Departamento de Odontología de la Universidade Federal do Rio Grande do Norte (UFRN), desde 1970 hasta 2017.* ***Resultados:*** *Se analizaron 15.527 registros histopatológicos en 48 años; 57 (0,37%) correspondieron a lesiones neurales benignas, con 24 (42,11%) neurofibromas, 15 (26,32%) neuromas traumáticos, nueve (15,79%) neurilemomas, tres (5,26%) compuestos por tumores de células granulares, tres (5,26%) épulis congénitos y tres (5,26%) neuromas circunscritos solitarios. Tres pacientes (12,5%) con neurofibroma también presentaron neurofibromatosis tipo I. La mayor parte de los pacientes era del sexo femenino (56,66%), con edades comprendidas entre los 3 días y los 79 años.* ***Conclusión:*** *Los dados obtenidos confirmaron que tumores de origen neural son poco comunes en la cavidad oral y que los neurofibromas son los más frecuentes, mientras que el sexo femenino es el más afectado y la lengua, el sitio anatómico más prevalente.*

Palabras clave: *neoplasias; boca; epidemiología.*

INTRODUCTION

Peripheral nerve sheath lesions are among the various diseases that can affect the nervous tissue. These include benign and malignant reactive or neoplastic processes that develop from the proliferation of the nerves themselves (axons and Schwann cells) or from their limiting sheaths, and diagnoses can sometimes be challenging[1]. These neural origin lesions may occur in the maxillofacial region, although they are rare[2, 3].

In this context, benign tumors include traumatic neuroma, neurofibroma, neurilemoma, granular cell tumors, congenital epulis, and solitary circumscribed neuroma[3-5]. Although rare, the association of some of these lesions with clinically relevant syndromes, such as neurofibromatosis, have been reported[6].

The most noteworthy benign neural neoplasms that affect oral tissues are neurofibroma and neurilemoma. Neurofibroma is the most common type of peripheral nerve neoplasm, characterized by Schwann and perineural cell and endoneurial fibroblast proliferation[7]. These neoplasms are rare and represent 28.6% to 29% of the neural lesions that occur in the oral and maxillofacial complex[3, 4]. When present in the oral cavity, these lesions occur mainly on the tongue, jugal mucosa, lips, palate, and gingiva. In rare cases, intraosseous neurofibroma may be present[8-10].

Neurilemomas, also named Schwannomas, were first described by Verocay in 1910, and they are typically a well-circumscribed, slow-growing neoplasm displaying preference for the tongue and lips in the oral cavity[11]. They are exclusively composed by neoplastic Schwann cells[12] and are very uncommon, although about 25% to 48% of all cases affect the head and neck region[13].

Retrospective studies that address clinical and pathological benign peripheral nerve sheath lesion characteristics are important to contribute for a better understanding of patients affected by these lesions, as well as their clinical manifestations. In this context, the aim of the present study is to analyze a 48-year epidemiological data from a series of benign neural lesions of the oral and maxillofacial complex diagnosed at a reference anatomical service in northeastern Brazil, carrying out comparisons to literature data.

METHODS

This study was approved by the Research Ethics Committee (Number 2,167,121) of the Universidade Federal do Rio Grande do Norte (UFRN). The study comprised a descriptive and retrospective analysis of clinical data contained in the medical records of patients diagnosed with benign oral lesions of neural origin diagnosed and filed at the UFRN Dentistry Department, from 1970 to December 2017. This is one of the oral and maxillofacial pathology reference centers in Brazil and the main center in Rio Grande do Norte state.

Data regarding patient age and sex and lesion location, aspect, size, color, symptomatology, and treatment were compiled from the clinical data associated with the biopsy records. All cases associated with histopathological reports of any benign neural

lesion containing information in clinical records or electronic databases were included, while cases presenting less than 10% of the relevant clinical information were excluded.

The information contained from patient records include consultation year, sex and age. Lesion-related parameters comprised anatomical location, lesion aspect, size, color, symptomatology and treatment (excisional biopsy, incisional biopsy, and associations). Ethnicity was not considered, since the Brazilian population is composed of an extensive mixture of Amerindians, Europeans, and Africans[14] and no racial categorization would reflect the true ethnic distribution of the patients, making it difficult to compare this variable to other studies. Obtained data were tabulated in a spreadsheet and a descriptive statistical analysis was performed.

TABLE 1 – Frequency of the lesions

Tumor	*n* (%)	Age (mean/range)	Sex (M/F)	Most common anatomical site
Neurofibroma	24 (42.11%)	39.1 years (10-77)	16/8	Tongue/alveolar ridge
Traumatic neuroma	15 (26.32%)	60.5 years (27-79)	3/12	Alveolar ridge
Neurilemoma	9 (15.79%)	28 years (10-53)	4/5	Tongue
Granular cell tumor	3 (5.26%)	32.8 years (12-58)	2/4	Tongue
Congenital epulis	3 (5.26%)	6.9 days (3-16)	0/3	Alveolar ridge in maxilla
Solitary circumscribed neuroma	3 (5.26%)	30.5 years (16-37)	1/2	Tongue/lower lip/ alveolar ridge in mandible

M: male; F: female.

RESULTS

A total of 15,527 different pathological processes were registered at the UFRN Dentistry Department during the 48-year study period. From this total, 60 (0.37%) comprised tumors of neural origin, distributed in the following histological types: 24 (42.11%) neurofibromas, 15 (26.32%) traumatic neuromas, nine (15.79%) neurilemomas, three (5.26%) granular cell tumors, three (5.26%) congenital epulis and three (5.26%) solitary circumscribed neuromas (**Table 1**).

Males were the most frequently affected by neurofibroma, whereas females were the most affected in all other processes evaluated, except for solitary circumscribed neuroma, which affected both males and females to the same extent. Patient age group varied considerably according to lesion diagnosis, where cases diagnosed as congenital epulis affected infants by approximately six days of age, while traumatic neuroma was diagnosed in patients presenting, on average, 60.5 years old (Table 1). From the 24 neurofibroma cases evaluated here, only three (12.5%) were associated with type I neurofibromatosis.

Regarding lesion size, most ranged between 1 cm and 4 cm, and a nodular aspect was most frequently documented. Painful symptomatology was an uncommon finding, present only in five (33.3%) traumatic neuroma cases and in one (11.1%) neurilemoma case (**Table 2**). Surgical excision was the most frequently documented treatment (Table 2).

DISCUSSION

Peripheral nerve sheath lesions are rarely found in the oral cavity[3,4]. Among the most common benign neoplasms are traumatic

TABLE 2 – Clinical features of the benign neural lesions

	Neurofibroma	Traumatic neuroma	Neurilemoma	Granular cell tumor	Congenital epulis	Solitary circumscribed neuroma
Size						
< 1 cm	0 (0%)	7 (46.6%)	0 (0%)	0 (0.06%)	0 (0%)	0 (0%)
1-4 cm	0 (0%)	8 (53.3%)	7 (77.7%)	3 (100%)	3 (100%)	3 (100%)
> 4 cm	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
NI	24 (100%)	0 (0%)	2 (22.2%)	0 (0%)	0 (0%)	0 (0%)
Symptomatology						
Present	0 (0%)	5 (33.3%)	1 (11.1%)	0 (0%)	0 (0%)	0 (0%)
Absent	0 (0%)	8 (53.3%)	8 (88.8%)	3 (100%)	0 (0%)	3 (100%)
NI	24 (100%)	2 (13.3%)	0 (0%)	0 (0%)	3 (100%)	0 (0%)
Aspect of the lesion	Nodular	Nodular	Nodular	Nodular	Nodular	Nodular
Treatment						
Surgical excision	24 (100%)	12 (80%)	6 (66.6%)	6 (100%)	3 (100%)	3 (100%)
NI	0 (0%)	3 (20%)	3 (33.3%)	0 (0%)	0 (0%)	0 (0%)

NI: not informed.

neuroma, schwannoma or neurilemoma, and neurofibromas. However, other, rarer benign tumors may also occur, including granular cell tumor, congenital epulis and solitary circumscribed neuroma[15]. In the present study, neural lesions corresponded to only 0.37% of the 15,527 cases comprising different types of lesions diagnosed at the UFRN Pathological Anatomy Service during the 48-year study period, demonstrating the low frequency of these lesions in the oral and maxillofacial complex.

Unlike the present study, which indicated neurofibroma as the most common lesions, Alotaibi *et al*. (2016)[3] and Salla *et al*. (2009)[4] point to a higher occurrence of traumatic neuroma. Patient age, regardless of lesion histological type, varied from three days to 79 years old, indicating that these lesions may occur over a wide age range. The results reported by Salla *et al*. indicate that most cases were detected in female patients (71.43%), as also observed in the present study. Neurofibroma is a benign neural proliferation consisting of Schwann cells, perineural cells, and fibroblasts which, in the oral cavity, may occur in solitary or multiple forms, associated or not with neurofibromatosis type 1[4, 7]. Although these neoplasms may be associated with syndromes, most lesions are sporadic[16, 17], as observed herein, in which, only three cases (12.5%) from a total of 24 were associated with type 1 neurofibromatosis.

Patients presenting neurofibroma in the present study were mostly male (66.6%), ranging from 10 to 77 years of age, with mean age of 39.1. The findings observed herein regarding the most affected age group are similar to those reported by Campos *et al*. (2012)[16], who reported mean age of 38.5. However, those authors observed a predominance of women (72.7%) in the study population.

Clinically, neurofibroma envolve, mainly, the tongue, lips and jugal mucosa, and are less frequent on the gingiva, palate and maxillary bones[16, 17]. In the present study, most cases were observed on the tongue and alveolar ridge, with no symptomatology. As neurofibroma clinical aspects are analogous to many other oral cavity lesions, a biopsy is mandatory to obtain an accurate diagnosis[16, 18].

Some studies indicate that most patients presenting traumatic neuroma, neurofibroma and granular cell tumor are women[2, 4, 19]. The present study is in accordance with these findings in relation to traumatic neuroma and granular cell tumor, which were present, in 80% and 66.66% of women respectively, unlike neurofibroma, which mostly affected men.

Traumatic neuroma are most frequently observed on the tongue and lips[3] usually associated with trauma reports. In the present study, these tumors affected adults with a mean age of 60.5. Neurilemomas are observed in several areas but are frequent on the lips[11]. Granular cell tumors are more frequent on the tongue[3, 19], corroborating the present study and the results reported by Franco *et al*. (2017)[5].

Most lesions ranged from 1 cm to 4 cm in size, in agreement with data reported by Franco *et al*. who reported mostly small lesions. However, tumors measuring 3 cm or greater were detected among neurilemoma, traumatic neuroma, neurofibroma, and granular cell tumor cases. All cases presented a nodular appearance, with almost no symptomatology. Solitary circumscribed neuroma corresponded to three cases only, corroborating their rarity in the oral cavity, as reported by the relevant literature[3, 5].

In general, most lesions are treated by surgical excision, but, in the case of neurofibroma, all patients should be clinically evaluated concerning the possibility of association with neurofibromatosis[15]. If this association is confirmed, the risk of malignant transformation of these lesions should be considered, which occurs in 5% to 15% of cases[1, 3].

CONCLUSION

Benign neural lesions in the maxillofacial complex are rare and the clinical profile of the patients observed in the present study was consistent with data commonly reported in the literature. This study suggests that these lesions present predominantly as asymptomatic nodules and are mostly treated by surgical excision. In general, this study promotes knowledge of epidemiological data by dentistry professionals, which is essential for the correct diagnosis and treatment of patients presenting these lesions, as well as for differential diagnosis concerning other types of lesions.

REFERENCES

1. Rodriguez FJ, Folpe AL, Giannini C, Perry A. Pathology of peripheral nerve sheath tumors: diagnostic overview and update on seclected diagnostic problems. Acta Neuropathol. 2012; 123: 295-319.

2. Nascimento GJF, Rocha DAP, Galvão HC, Costa ALL, Souza LB. A 38-year review of oral schwannomas and neurofibromas in a Brazilian population: clinical, histopathological and immunohistochemical study. Clin Oral Investig. 2011; 15: 329-35.

3. Alotaibi O, Al Sheddi M. Neurogenic tumors and tumor-like lesions of the oral and maxillofacial region: a clinicopathological study. Saudi Dent J. 2016; 28: 76-9.

4. Salla JT, Johann ACBR, Garcia BG, Aguiar MCF, Mesquita RA. Retrospective analysis of oral peripheral nerve sheath tumors in Brazilians. Braz Oral Res. 2009; 23: 43-8.

5. Franco T, de Freitas Filho SAJ, Muniz LB, de Faria PR, Loyola AM, Cardoso SV. Oral peripheral nerve sheath tumors: a clinicopathological and immunohistochemical study of 32 cases in a Brazilian population. J Clin Exp Dent. 2017; 9: e1459-65.

6. Zwane NP, Noffke CE, Raubenheimer EJ. Solitary oral plexiform neurofibroma: review of literature and report of a case. Oral Oncol. 2011; 47: 449-51.

7. Ohno J, Iwahashi T, Ozasa R, Okamura K, Taniguchi K. Solitary neurofibroma of the gingiva with prominent differentiation of Meissner bodies: a case report. Diagn Pathol. 2010; 5: 61.

8. Narwal A, Saxena S, Rathod V, Bansal P. Intraoral solitary neurofibroma in an infant. J Oral Maxillofac Pathol. 2008; 12: 75-8.

9. Koutlaas IG, Scheithauer BW. Palisaded encapsulated (''solitary circumscribed'') neuroma of the oral cavity: a review of 55 cases. Head Neck Pathol. 2010; 4: 15-26.

10. Sharma A, Sengupta P, Das AK. Isolated plexiform neurofibroma of the tongue. J Lab Physicians. 2013; 5: 127-9.

11. Sanchis JM, Navarro CM, Bagán JV, et al. Intraoral schwannomas: presentation of a series of 12 cases. J Clin Exp Dent. 2013; 5: e192-6.

12. Weiss SW, Goldblum JR. Benign tumors of peripheral nerves. In: Weiss SW, Goldblum JR, editors. Enzinger and Weiss's: soft tissue tumors. 5th ed. St. Louis, MO: Mosby; 2008. p. 825-902.

13. Colreavy MP, Lacy PD, Hughes J, et al. Head and neck schwannomas – a 10 year review. J Laryngol Otol. 2000; 114: 119-24.

14. Parra FC, Amado RC, Lambertucci JR, et al. Color and genomic ancestry in Brazilians. Proc Natl Acad Sci USA. 2003; 100: 177-82.

15. Bharath TS, Krishna YR, Nalabolu GR, Pasupuleti S, Surapaneni S, Ganta SB. Neurofibroma of the palate. Case Rep Dent. 2014; 2014: 898505.

16. Campos MS, Fontes A, Marocchio LS, Nunes FD, de Sousa SC. Clinicopathologic and immunohistochemical features of oral neurofibroma. Acta Odontol Scand. 2012; 70: 577-82.

17. Angiero F, Ferrante F, Ottonello A, Maltagliati A, Crippa R. Neurofibromas of the oral cavity: clinical aspects, treatment, and outcome. Photomed Laser Surg. 2016; 34: 56-60.

18. Gujjar PK, Hallur JM, Patil ST, et al. The solitary variant of mandibular intraosseous neurofibroma: report of a rare entity. Case Rep Dent. 2015; 2015: 520261.

19. Rejas RA, Campos MS, Cortes AR, Pinto DD, de Sousa SC. The neural histogenetic origin of the oral granular cell tumor: an immunohistochemical evidence. Med Oral Patol Oral Cir Bucal. 2011; 16: e6-10.

CORRESPONDING AUTHOR

Roseana de Almeida Freitas ID 0000-0002-7577-5375
e-mail: roseanafreitas@hotmail.com