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CONCORDANCE BETWEEN CLINICAL AND HISTOPATHOLOGICAL DIAGNOSIS OF ORAL AND MAXILLOFACIAL LESIONS

CONCORDÂNCIA ENTRE O DIAGNÓSTICO CLÍNICO E HISTOPATOLÓGICO DE LESÕES ORAIS E MAXILOFACIAIS

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Abstract
Introduction: The agreement between clinical and histopathological diagnosis of oral and maxillofacial lesions remains a source of controversy. **Objective:** To evaluate the concordance between clinical and histopathological diagnosis of oral and maxillofacial lesions. **Methods:** Socio-demographic and clinical data were prospectively obtained from patients evaluated at outpatient clinics of a Brazilian research hospital. Morphological and histopathological findings of biopsied oral and maxillofacial lesions were utilized as the "gold standard" and the concordance status with prior clinical hypotheses was compared using the Pearson's chi-squared test at a 5% significance level. **Results:** Non-neoplastic proliferative processes were the most frequent type of lesion (29.6%) and posterior mandible was the most common location (20.73%). Clinical and histological correlation was high (78%), whereas most lesions were not found to be associated with age, gender or concordance status ($P > 0.05$). **Conclusion:** A high level of agreement between clinical and histopathological diagnosis was shown, but the quality of oral diagnosis should be continuously evaluated.

Keywords: Oral pathology. Clinical diagnosis. Biopsy.

Resumo
Introdução: *O nível de concordância entre o diagnóstico clínico e histopatológico de lesões orais e maxilofaciais ainda permanece controverso.* ***Objetivo****: Avaliar a concordância entre o diagnóstico clínico e histopatológico de lesões orais e maxilofaciais.* ***Métodos****: Dados sociodemográficos e clínicos foram coletados prospectivamente de pacientes atendidos em clínicas de um centro de pesquisa brasileiro. Os achados morfológicos e histopatológicos obtidos de biópsias orais e maxilofaciais foram utilizados como "padrão-ouro" e o estado de concordância com hipóteses clínicas anteriores foi comparado utilizando o teste qui-quadrado de Pearson com um nível de significância de 5%.* ***Resultados:*** *Os processos proliferativos não neoplásicos foram o tipo de lesão mais frequente (29,6%) e a região intraóssea na mandíbula posterior foi a localização mais comum de lesão (20,73%). A correlação clínica e histológica foi alta (78%), enquanto a maioria das lesões não foi associada com idade, sexo ou estado de concordância (P > 0,05).* ***Conclusão:*** *Um alto nível de concordância entre o diagnóstico clínico e histopatológico foi demonstrado, mas a qualidade do diagnóstico oral deve ser avaliada continuamente.*

Palavras-chave: *Patologia oral. Diagnóstico clínico. Biopsia.*

Introduction

In certain clinical situations, procedures such as biopsies are highly recommended to clarify or confirm a pathologic diagnosis, leading to the development of individualized treatment planning, prognosis and proservation of patients with oral lesions[1-3]. However, during the establishment of a pathologic diagnosis, clinicians should take into account the possibility of a variety of intrinsic or extrinsic etiologic agents[4,5].

A wide range of oral lesions, especially premalignant dysplasias, are likely to generate a dubious diagnosis. Histological analysis is thus considered to be the "gold standard" for precise diagnosis of suspicious lesions[6,7]. On the other hand, some clinicians might assume that histological examination is sufficient for identifying most orofacial injuries, leading them not to supply clinical information[1,8]. In addition, issues related to incorrect surgical removal of specimens may affect the accuracy of histopathologic analysis[4,9].

In this context, studies assessing the correlation between clinical diagnostic impressions and histological examinations, by analyzing factors that lead to disagreements, draw attention to the importance of a rational use of oral lesions' biopsies[10,11]. Hence, we aimed to evaluate the correlation between presumable clinical diagnosis and histopathological reports of lesions located in the oral and maxillofacial region, thereby contributing to appropriate clinical decision making.

Materials

Sample selection

A prospective study that included clinical and morphological/histopathological evaluation of oral and maxillofacial lesions was conducted. Patients coming from spontaneous demand or referred to the Oral and Maxillofacial Surgery outpatient clinics at the University Hospital of the Federal University of Maranhão were selected. All patients whose lesions had precise indication for incisional or excisional biopsy were included. Cases in which clinical diagnosis was sufficient to elucidate diagnosis and patients with uncompensated systemic disease (ASA III and IV) were excluded. When specimens were considered insufficient or inappropriate for diagnosis or with a merely

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descriptive diagnosis, we proceeded to perform a second biopsy or excluded the case. This study was approved by the local Research Ethics Committee (protocol nº 001520/2013-60; Brazil).

Data collection

Information obtained from patients included gender, age, presence or absence of systemic diseases, and last dental appointment. Data regarding lesions were the following: evolution time, anatomical location, type of biopsy performed and two clinical hypotheses for each case, based on clinical and radiographic features. Next, following the histopathological report, the agreement between clinical hypothesis and histopathological diagnosis was evaluated. Lesions were then classified in ten groups: pulp and periapical pathology, non-neoplastic proliferative processes (NNPPs), infection, cyst, odontogenic tumor, fibrous-osseous lesion, precancerous lesion, salivary gland pathology, malignant neoplasm, or not specified[12].

Statistical analysis

Distribution of variables was presented using absolute and relative frequencies, and the Pearson's chi-square test was used to investigate potential associations at a 5% significance level. Data were analyzed using the Statistical Package for Social Sciences software - IBM SPSS 23.0 (SPSS Inc., IL, USA).

Results

The analysis of 145 examined patients showed that 82 of them had some lesion requiring biopsy. Fifty-one individuals (62.2%) were female and 31 (37.8%) were male. Age at diagnosis ranged from 13 to 72 years, with a slightly greater prevalence in the group aged 41-60 years (40.2%). Still, 20.7% of patients reported having at least one systemic disease. When asked about the last dental appointment, women were shown to be more assiduous compared men. Regarding biopsy modality, excisional biopsies were performed in the majority of cases (n = 48). It was shown an agreement between clinical and histopathological diagnosis in 78%, disagreements in 19.5% and inconclusive results in 2% of cases evaluated. Inconclusive cases were re-biopsied (Table 1).

According to the anatomical location, the gingiva/alveolar ridge (20.73%) and intraosseous posterior mandible (19.5%) were the most affected sites by lesions, respectively. Face and floor of the mouth were the less frequent sites affected by pathologies (2.44%), whereas malignant lesions corresponded to 7.4%, and histologically unspecified to 4.9% (Figure 1).

Older patients were more likely to be affected by malignant neoplasms ($P < 0.05$). Younger individuals (<20 to 40 years) had a trend for higher prevalence of odontogenic tumors ($P = 0.06$). Age was not associated with other lesions ($P > 0.05$; Table 2).

In this study, women showed a trend for a greater likelihood of having salivary gland pathologies (OR = 0.6; 95% CI: 0.5–0.7) and oral infections (OR = 0.7; 95% CI: 0.6–0.8). There was also a trend for pulp and periapical pathologies to occur more frequently in males (OR = 0.2; 95% CI: 0.03–1.1; $P = 0.05$), and no other association related to gender was observed (Table 3).

Overall, most lesions presented with a positive concordance between clinical and histopathological diagnosis. Nevertheless, there was no statistically significant association between any of these lesions with the concordance status ($P > 0.05$; Table 4).

Table 1 - Distribution of patients according to gender, age group, systemic disease, time since the last dental consultation, type of biopsy, concordance status, and classification of lesion.

Variables	n	%
Gender		
Female	51	62.2
Male	31	37.8
Age group		
<20 years	18	21.9
21-40 years	22	26.8
41-60 years	33	40.2
<60 years	09	10.9
Systemic diseases		
Yes	17	20.7
No	65	79.3
Last dental consultation		
<1 year	18	22.0
1-5 years	38	46.3
>5 years	26	31.7
Type of biopsy		
Excisional	48	58.5
Incisional	34	41.5
Concordance status		
First hypothesis	51	51.0
Second hypothesis	13	13.0
Discordant	16	16.0
Inconclusive	02	02.5
Classification of lesion		
Pulp and periapical pathology	07	08.6
NNPP	24	29.6
Infection	03	03.7
Cyst	10	12.3
Odontogenic tumor	17	19.7
Fibrous-osseous lesion	06	07.4
Precancerous lesions	01	01.2
Salivary gland pathology	04	04.9
Malignant neoplasm	06	07.4
Non specificated	04	04.9

NNPP: non-neoplastic proliferative processes.

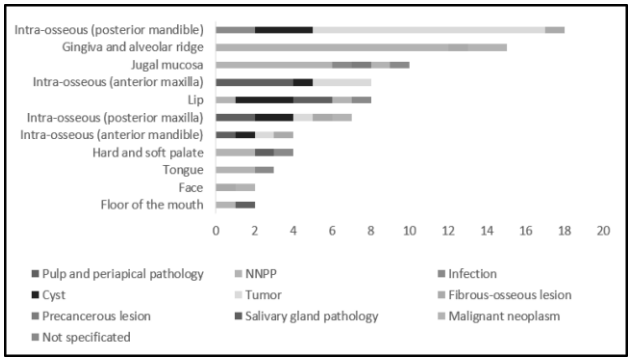

Figure 1 - Distribution of oral and maxillofacial lesions diagnosed in the present study, according to the anatomic site affected.

Table 2 - Comparison of the frequencies of oral and maxillofacial lesions according to the age group.

Type of lesion	Age group (n)				Total (n)	p-value
	<20	21-40	41-60	>60		
Pulp and periapical pathology	02	01	03	01	07	0.91
NNPP	03	05	12	04	24	0.31
Infection	02	01	-	-	03	0.24
Cyst	02	04	03	01	10	0.74
Odontogenic tumor	06	07	04	-	17	0.06
Fibrous-osseous lesion	01	01	03	-	05	0.72
Precancerous lesion	01	-	-	-	01	0.34
Salivary gland pathology	01	-	03	-	04	0.39
Malignant neoplasm	-	01	02	03	06	0.02*
Not specificated	01	01	01	01	04	0.85

NNPP: non-neoplastic proliferative processes; *P < 0.05, according to the Chi-squared test.

Table 3 - Comparison of the frequencies of oral and maxillofacial lesions between male and female patients.

Type of lesion	Gender				OR (95% CI)	*p*-value
	Male		Female			
	n	%	n	%		
Pulp and periapical pathology	05	71.4	02	28.6	0.2 (0.03-1.1)	0.05
NNPP	09	37.5	15	62.5	1.0 (0.3-2.7)	0.97
Infection	-	-	03	100.0	0.6 (0.5-0.7)	0.16
Cyst	05	50.0	05	50.0	0.5 (0.1-2.1)	0.39
Odontogenic tumor	07	41.2	10	58.8	0.8 (0.2-2.4)	0.74
Fibrous-osseous lesion	01	20.0	04	80.0	2.5 (0.2-23.9)	0.39
Precancerous lesion	-	-	01	100.0	0.6 (0.5-0.7)	0.43
Salivary gland pathology	-	-	04	100.0	0.6 (0.5-0.7)	0.11
Malignant neoplasm	03	50.0	05	50.0	0.5 (0,1-3.0)	0.52
Not specificated	01	25.0	03	75.0	1.8 (0.1-18.8)	0.58

CI: confidence interval; NNPP: non-neoplastic proliferative processes; OR: odds ratio; Chi-squared test.

Table 4 - Comparison of the frequencies of oral and maxillofacial lesions according to the concordance status between clinical and histopathological diagnosis.

Type of lesion	Status				OR (95% CI)	p-value
	Concordant		Discordant			
	n	%	n	%		
Pulp and periapical pathology	06	85.7	1	14.3	0.6 (0.06-5.4)	0.66
NNPP	22	83.3	2	16.7	0.6 (0.2-2.3)	0.55
Infection	03	100.0	-	-	0.7 (0.6-0.8)	0.36
Cyst	07	70.0	3	30.0	1.7 (0.4-7.7)	0.44
Odontogenic tumors	15	88.2	2	11.8	0.4 (0.09-2.1)	0.30
Fibrous-osseous lesion	04	80.0	1	20.0	0.9 (0.1-9.1)	0.96
Precancerous lesion	01	100.0	-	-	0.7 (0.7-0.8)	0.60
Salivary gland pathology	02	50.0	2	50.0	4.2 (0.5-32.2)	0.13
Malignant neoplasm	04	66.7	2	33.3	2.0 (0.3-12.1)	0.42
Not specificated	02	50.0	2	50.0	4.2 (0.5-32.2)	0.13

CI: confidence interval; NNPP: non-neoplastic proliferative processes; OR: odds ratio; Chi-squared test.

Discussion

This prospective study evaluated the correlation between clinical hypothesis and histopathological diagnosis of oral and maxillofacial lesions. Regarding gender and age, there was a greater number of oral pathologies among women and the group aged 41-60 years. Similar data are reported in several other studies[3,4,7,10,13,14]. it remains unclear whether there is a higher prevalence of oral lesions in women or they are more aware of health care services, thereby seeking them more often[7]. Indeed, when reporting their last dental appointment, women were more assiduous compared to men.

Definition of a pathologic diagnosis frequently relies on instruments to assess and then correlate its clinical, histopathological and radiologic characteristics[9]. To establish the location of a lesion is crucial for pathologists to differentiate tissues affected from histological features of each anatomic region[3]. In this regard, the most affected anatomical sites by lesions in the patients evaluated were the posterior intraosseous region of the mandible followed by the gingiva/alveolar ridge.

Lesions commonly found were the NNPPs, whose location is predominant in the gingival tissues and mucosal lining. In particular, there was a greater number of fibroma, followed by inflammatory fibrous hyperplasia, corroborating with prior reports[13,15]. In a study with 3,549 lesions, authors observed a high prevalence of fibroma (12.7%) and inflammatory fibrous hyperplasia (11.3%)[11]. In terms of nonspecific lesions, inflammatory components may have influenced histomorphological results[16]. Inflammation may lead to reactive atypia and is associated with dysplastic changes in a potentially malignant lesion[6].

Clinical diagnosis of oral lesions with different etiologies may be complex due to their morphological similarities[1]. This study comprised two biopsy modalities, excisional (58.5%) and incisional (41.4%). A significant number of excisional biopsies (59.4%) was reported in another study. A high rate of excision biopsies is due to the small size of most oral cavity lesions, leading to the use of complete excision as a modality of treatment[4]. Regarding the concordance between clinical hypothesis and histological reports, it was found an agreement with the first hypothesis in 62.2% and with the second hypothesis in 15.8% of cases, resulting in a total of 78% agreement, similarly to prior reports[14,4].

PNNPs showed the highest index of clinical and histological agreement, suggesting that because they are easily detected, clinical diagnosis is facilitated. A previous study reported a high percentage of agreement (87.8%), corroborating to recent findings, where diagnostic accuracy was evaluated in 1,003 samples, displaying an agreement of 95.9% among benign lesions and 66.7% among premalignant or malignant lesions[10,13]. Discordant results were shown in 305 reports, which found a 40% diagnostic accuracy[17].

Another report found high sensitivity but low specificity of clinical examination compared to histological diagnosis for detecting dysplastic lesions and oral squamous cell carcinomas[18]. In another study evaluating 1,566 cases, an inaccurate clinical diagno-

sis was reported in 78.9% of malignant neoplasms[5]. This emphaticizes the need for improvement of clinical examination for the early detection of oral cancer. Important data can be overlooked by health care professionals during anamnesis or clinical examination, complicating the formulation of hypothesis based on signs and symptoms[11]. Poorly described clinical information and inadequate characterization of lesions do not contribute to effective histopathological diagnosis.

Moreover, issues that can directly affect histological diagnosis include the lack of representativeness of biopsied material, handling or inadequate fixation of especims[9,16]. Therefore, a more direct and objective communication between clinicians and oral pathologists is necessary in cases of disagreement in order to achieve a correct diagnosis[7,9,19,20]. In this study, biopsies were repeated after preliminary inconclusive reports, culminating in the same result after second examination. Those were included in the group of 'not specified' lesions.

The satisfactory agreement rate in the present study may be explained by the fact that clinical examination was fully performed by trained dentists. High degree of agreement is more expected among specialized professionals than among general practitioners[7]. Further studies are recommended to evaluate the degree of agreement between clinical and histological diagnosis between different professionals. Importantly, several studies addressed aspects of oral lesions prevalence through retrospective analysis of medical records[3,8,14,15].

However, the correlation between clinical hypothesis and histopathologic findings remains underreported[4]. This study differs from others by its prospective approach, which excluded possible failures regarding incomplete data collection, providing a more reliable evaluation of patients and lesions. Nevertheless, we suggest the development of prospective studies involving different populations, evaluating socioeconomic factors that could influence the results, and standardizing research methods and protocols for specimen collection for histological analysis.

Overall, there was a high concordance rate between clinical hypothesis issued by oral and maxillofacial surgeons and the histopathological diagnosis of oral lesions, corroborating with prior studies. Nevertheless, we stress the importance of evaluating the quality of clinical examination by health care professionals towards improving the accuracy of clinical diagnosis.

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