



Concordance between clinical and histopathological diagnosis of intraosseous lesions in a reference center

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ABSTRACT

Objective: To evaluate the concordance between clinical and histopathological diagnosis of intraosseous lesions in individuals treated in a Reference Centre from 2006-2017. **Material and Methods:** A retrospective concordance study was conducted, reviewing the biopsy files and conclusive anatomopathological reports of intraosseous lesions. The collected data was analyzed in SPSS v10.0. The data were descriptively analysed obtaining the average age, gender frequency and most affected anatomical location. Cohen's Kappa statistical test separately assessed the concordance between clinical and histopathological diagnoses of all intraosseous lesions and groups of cysts, tumours, and bone-associated lesions. All tests adopted a statistical significance level of 5%. **Results:** 255 biopsied lesions met the inclusion criteria. Most of the individuals were females (67.8%) in the third decade of life (20.8%) with a predominance of posterior mandibular lesions (42.4%). It was observed that concordance between the diagnoses of intraosseous lesions occurred in 66.7% of the treated cases ($\kappa = 0.475$). The following rates were obtained: 63.3% for tumours ($\kappa = 0.171$), 69.1% for lesions associated to bones ($\kappa = 0.242$) and 66.7% for cysts ($\kappa = 0.233$). **Conclusion:** Concordance of diagnoses of all intraosseous lesions was moderate ($\kappa = 0.475$), being higher in the bone-associated lesions (reasonable $\kappa = 0.242$) and lower in tumours (poor $\kappa = 0.171$).

Keywords: Clinical diagnosis, biopsy, pathology, oral, jaws.

INTRODUCTION

Diagnosing a disease of the oral cavity requires having adequate information about the patient and their conditions from a clinical examination, which consists of anamnesis, physical exploration and, if necessary, complementary imaging and/or histopathology studies, in order to provide adequate treatment and an accurate prognosis.¹

Intraosseous lesions of the maxillomandibular complex, also called central lesions, can be divided into three groups: cysts (odontogenic and non-odontogenic), tumours (odontogenic and non-odontogenic) and bone-associated lesions. Tumours are relatively rare lesions in dental practices; incidence depends on their location. In Brazil, epidemiological studies report about 3% of all diagnosed oral lesions are tumours.^{2,3} Bone-associated lesions and cysts, in turn, are more commonly found in dental practice. However, national epidemiological data are scarce.⁴

For a correct diagnosis of oral diseases, it is essential to know the clinical characteristics of the lesions, such as shape, size, location and time of evolution, as well as their epidemiological aspects, all of which can be confirmed by imaging and/or histopathological examination.⁵

The intraosseous lesions biopsy is justified since they not always show clinical and imaging

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characteristics that allow a diagnosis only using a visual or clinical examination. Most of these lesions are symptomatic and generally discovered by routine radiographies or when the patient reports an increase in volume, followed with an X-ray of the region.⁶ Despite this, a clinical exploration sheds light on important signs and symptoms, making it possible to complement the information provided by the initial diagnosis with that found in the histopathological examination.

To determine the appropriate clinical diagnosis, it is useful to analyse concordance studies between clinical and histopathological diagnoses that include age, sex and anatomical location, in addition to comparing the results with those of the other pathology centers.⁷

The clinical diagnosis not supported by histopathologic examination can lead to negligence of significant lesions and lead to an incorrect treatment, which can result in a poor prognosis. Thus, this type of study becomes relevant to analyse whether the lesions behave clinically as expected, establish the appropriate diagnosis and determine an adequate treatment in each case.^{8,9}

Keeping this in mind, the aim of the present study was to evaluate the concordance between clinical and histopathological diagnoses of intraosseous lesions in individuals attended at the Reference Centre for Oral Lesions (RCOL) of the State University of Feira de Santana (SUFS) from 2006 to 2017.

MATERIAL AND METHODS

Design, area of study and characterization of the sample

This is a retrospective concordance study based on the collection of biopsies and conclusive anatomopathological reports of individuals diagnosed with intraosseous lesions in the Dentistry course, from 2006 to 2017, by the RCOL-SUFS.

Inclusion criteria

- Patients who underwent a biopsy procedure and had conclusive histopathological reports for intraosseous lesions, issued from 2006 to 2017.

Exclusion criteria

- All patients with oral disorders who did not have a histopathological report.
- Descriptive histopathological reports with the same registry number.

- When there were two reports from the same patient, the first about an incisional biopsy and the second one from the total removal of the lesion, considered only the first one.

Data collection and selected variables

Data collection procedure was performed based on the information contained in the biopsy records and histopathological reports of patients diagnosed with intraosseous lesions of the maxillomandibular region and who met the inclusion criteria. The following variables were selected for analysis: sex (male and female), age (full years), anatomical location (anterior mandible-lower incisors and canines, posterior mandible-lower molars and premolars, anterior maxilla-upper canines and incisors, posterior maxilla-upper molars and premolars), clinical and histopathological diagnoses. The present study grouped the intraosseous lesions according to the 2017 World Health Organization (WHO) criteria.¹⁰

Statistical analysis

The data were recorded in an Excel Program database (Office 2007, Microsoft®) and imported into the statistical programming software (Statistical Package Social Sciences-SPSS version 10.0), for treatment and generation of results.

Initially, a descriptive analysis of the data was performed, in which mean age and frequency of gender, age group and anatomical location were most affected. Concordance between clinical and histopathological diagnoses of all intraosseous lesions and the cysts, tumours and bone-associated lesions exclusively was determined, and the kappa statistical test was applied. All tests adopted a statistical significance level of 5%.

Kappa coefficient interpretation was performed according to the criteria proposed by Landis and Koch¹¹ (1977), following next scale: without concordance (< 0); poor concordance (0 to 0.19); reasonable concordance (0.20 to 0.39); moderate concordance (0.40 to 0.59); substantial concordance (0.60 to 0.79), and excellent concordance (0.80 to 1.00).

Ethical aspects

The study complied with the resolution 196/96 (chapter IX.2) about research involving human subjects registered in the Ethics Committee of the State University of Feira de Santana (CEP-UEFS) under protocol no. 015/2008, CAAE0015.0.059. 000-08.

RESULTS

2,051 oral lesions biopsied during the period from 2006 to 2017 in the CRLB-UEFS, of which 255 (12.4%) met the inclusion criteria (*Figure 1*).

Most of the subjects were female (67.8%) and were in their third decade of life (20.8%); the age ranged from 4 to 88 years with a mean of 38.8 years and a standard deviation of 19.8. Regarding the anatomical location of the lesions, there was a predominance of the posterior mandible region (42.3%) (*Table 1*).

With a 0.475 kappa coefficient, there was a 66.7% concordance between clinical and histopathological diagnoses of intraosseous lesions. In all groups, a 63.3% concordance rate was found in tumours, 66.7% in cysts and 69.1% in bone-associated lesions. Kappa coefficient was 0.171 for tumours ($p > 0.05$), 0.233 for cysts, and 0.242 for bone-associated lesions (*Table 2*).

DISCUSSION

Concordance rate of clinical and histopathological diagnoses of all intraosseous lesions of the CRLB-UEFS was 66.7%, similar to the study carried out by Seifi et al.¹² (2010), which obtained 66.6%, but relatively lower than the frequencies found by Araujo⁶ (2015) and Chen et al.¹³ (2015), equal to 76.8 and 89.8%, respectively. This variation may be related to different sample sizes, study time, and data collection.

Kappa statistical analysis of the intraosseous lesions indicated a moderate concordance. Emeka et al.¹⁴ (2016) in evaluating a group composed of central and peripheral lesions, also found moderate concordance, using a kappa coefficient of 0.450. In a study by Seifi et al.¹² (2010), the kappa coefficient was 0.609, corresponding to a substantial concordance. The kappa coefficient below excellent may be a consequence of the difference in clinical approach

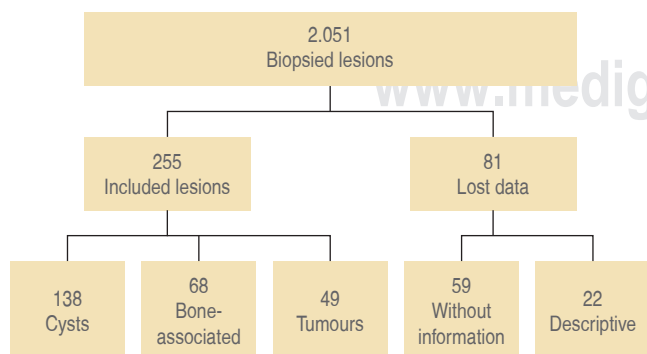


Figure 1: Distribution of intraosseous lesions algorithm.

Table 1: Number and percentage of patients treated by RCLB-UEFS affected by intraosseous lesions according to gender, age and anatomical location, Feira de Santana, Bahia, 2006-2017 (N = 255).

Variables	Intra-osseous lesions n (%)
Gender	
Male	82 (32.2)
Female	173 (67.8)
Age range	
0-10	13 (5.1)
11-20	47 (18.4)
21-30	35 (13.7)
31-40	53 (20.8)
41-50	30 (11.8)
51 a 60	35 (13.7)
60+	42 (16.5)
Anatomical location	
Anterior mandible	42 (16.5)
Posterior mandible	108 (42.3)
Anterior maxilla	65 (25.5)
Posterior maxilla	40 (15.7)
Total	255 (100.0)

of each surgeon, years of experience in the area and difficulty in the clinical diagnosis of intraosseous lesions, since they are generally asymptomatic and have similar clinical characteristics.

The highest concordance between diagnoses was found in the group of bone-associated lesions (69.1%), followed by cysts group (66.7%) and tumours group (63.3%). It was observed that this was a balanced rate in all of the groups, which contrasts with the Mendez et al.¹⁵ study (2016), in which the cysts group presented a 44.2% concordance in the diagnoses, while in the odontogenic tumours group the rate was 78.7 and 76.2% in the bone-associated lesions group. The cysts group presented the lowest concordance and there was a discrepancy when compared to others. This result may be because in some situations dentigerous cysts detected by radiographic evaluations resemble apparently normal dental follicles, thus raising the discordance index of the cysts group.¹⁶

The present research found a poor concordance kappa coefficient in tumours group and reasonable concordance in bone-associated lesions and cysts groups. Emeka et al.¹⁴ (2016) obtained moderate concordance for both the cysts category and the tumours. In the study by Tatli et al.¹⁷ (2013), carried out at a Dentistry University in Turkey, the result of the kappa coefficient showed excellent concordance in the three groups. High concordance can be explained by the higher incidence of lesions with

well-defined clinical characteristics and differences in teaching methods of school clinics in developed countries. It is worth mentioning that the present study categorized intraosseous lesions based on the 2017 WHO classification, while the comparison studies considered the 2005 WHO classification, which presents differences in grouping of some important lesions, such as keratocyst and calcifying odontogenic cyst, which may have influenced the different results.¹⁰

In the tumours group the p value was not statistically significant due to the low level of concordance evidenced by the kappa coefficient. This association is suggested due to the sample being the smallest of the three groups analysed. One reason for reducing the number of tumours in this study is that in the new WHO classification of 2017, keratocyst, one of the most prevalent lesions, is no longer considered a tumour but a cyst. In addition, because it is an outpatient service, it is known to perform procedures of low complexity under local anaesthesia, which reinforces a search or referral of tumours of non-aggressive behaviour, which usually present a radiographic unilocular aspect, similar to most cysts.

Studies that evaluate the concordance of different means of diagnosis were also conducted in other health fields, which highlights the importance of applying this study design. Barros et al.¹⁸ (2010) used Doppler of the lower limbs versus transvaginal to identify pelvic varices, evidencing a total concordance of 62.2%. The kappa coefficient resulted in a reasonable concordance -0.31. Gomes et al.¹⁹ (2018) analysed the concordance of dermatoscopical and histological diagnoses of benign or malignant melanocytic lesions obtaining a kappa coefficient of 0.303, considered reasonable.

Intraosseous lesions were more frequent in females, corroborating most of the findings in literature.^{6,20,21} This fact may be related to the demand for dental services that females express more than males, since they undergo dental examinations more frequently

and / or because some lesions are more prevalent in them. However, other studies show similar frequencies in males and females, with a slight prevalence in males.^{3,22} This result may be justified by variations in the epidemiological profile of lesions by different demographic regions and by those studies that involve specific groups of lesions, while the present study covers all intraosseous lesions.

When analysing the age group, the most affected was the thirddecade of life. Similar results were found in Borges et al.²³ (2012) and Tatli et al.¹⁷ (2013) studies. However, data relating age range varies throughout literature, possibly due to the diversified method and time of data collection in most of the diverse studies.^{20,24}

Regarding the anatomical location of the lesions, there was a predominance in the mandible, especially in the posterior region, with several studies coinciding.^{2,3,21,22} On the other hand, the studies by Pereira et al.²⁴ (2010) and Niranjan and Shaikh²⁵ (2014) report apredominance of maxillary lesions. One of the explanations why the posterior region of the mandible is more affected is the increasing frequency in the general population of impacted third molars that can produce mechanical, inflammatory, cystic and neoplastic complications, leading to the appearance of cysts and tumours of odontogenic origin.²⁶

Several studies have addressed the prevalence of localized lesions in the buccomaxillofacial complex^{1,5,9,21,22,24} However, The issue of precision in the evaluation of a clinical diagnosis based on its concordance with the histopathological diagnosis has been little explored.^{8,27} Thus, this research has social and scientific-pedagogical relevance, since it evaluated the concordance between clinical and histopathological diagnosis of intraosseous lesions of a reference center in oral lesions, during a considerable period of twelve years, in order to assess the capacity and knowledge of dental surgeons and dental academics in determining accurate diagnoses.

Table 2: Evaluation of the concordance between clinical and histopathological diagnosis of intraosseous lesions, RCLB-UEFS, Feira de Santana-BA, Brazil, 2006-2017 (N = 255).

Groups	Concordance		Discordance		Total	
	n (%)	n (%)	n (%)	n (%)	Kappa	p*
Cysts	92 (66.7)	46 (33.3)	138 (100)		0.233	0.006
Bone-associated lesions	47 (69.1)	21 (30.9)	68 (100)		0.242	0.032
Tumours	31 (63.3)	18 (36.7)	49 (100)		0.171	0.213
All intra-osseous lesions	170 (66.7)	85 (33.3)	255 (100)		0.475	0.000

*p < 0.05 (statistically significant).

Among the limitations of the research, it is important to mention that 81 pieces of data were lost due to the presence of poorly completed descriptive reports and biopsy data sheets that committed the quality of information provided to the pathologist and may have influenced the size and characterization of the sample. Descriptive reports can be the result of a lack of representativeness of the material collected at the time of biopsy, inadequate fixation or improper manipulation of the specimen. A biopsy sample that is not properly filled causes a lack of information necessary to complete the pathological diagnosis.

The results obtained from this research confirm the importance of performing a biopsy and subsequent histopathological analysis to conclude the diagnosis of intraosseous lesions, since many of them present similar clinical characteristics, with different treatments and prognoses. However, it is still interesting to evaluate the precision of a clinical diagnosis based on its concordance with the histopathological diagnosis, since the increase in concordance rates indicates a better performance of both students and teachers.

The present study found common ground in over half of the cases, which can be improved with frequent learning and building of knowledge, for the academics and professionals that work in the CRLB-UEFS, on the clinical, imaging, as well as the epidemiological aspects of intraosseous lesions.

CONCLUSION

As a whole, most of the subjects were women in their third decade of life and there was a predominance of lesions in the posterior region of the mandible. Concordance between the diagnoses of all intraosseous lesions was moderate ($\kappa = 0.475$), being higher in bone-associated lesions (reasonable $\kappa = 0.242$) and lower in tumours (poor $\kappa = 0.171$).

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