Correlation Between Clinical and Histopathological Diagnoses in Oral Cavity Lesions: a 12-year Retrospective Study

Azita Azad
Shiraz University of Medical Sciences
Mehdi Sasan Niya
Shiraz University of Medical Sciences
Shima Torabi
Shiraz University of Medical Sciences
Fahime Rezazadeh
Shiraz University of Medical Sciences
Alireza Ranjbaran
Shiraz University of Medical Sciences
Golnoush Farzinnia (farzinniag@gmail.com)
Shiraz University of Medical Sciences

Research Article

Keywords: Diagnosis, Oral, Histology, Biopsy

Posted Date: September 24th, 2021

DOI: https://doi.org/10.21203/rs.3.rs-886939/v1

Version of Record: A version of this preprint was published at International Journal of Dentistry on May 14th, 2022. See the published version at https://doi.org/10.1155/2022/1016495.

Abstract

Background: Proper diagnosis plays key roles in the treatment and prognosis of all diseases. Although histopathological diagnosis is still known as the gold standard, final diagnosis becomes difficult unless precise clinical descriptions are obtained. So, this study aimed to evaluate the consistency of the clinical and histopathological diagnoses of all oral and maxillofacial biopsy specimens in a 12–year duration.

Methods: After receiving the ethical approval from Shiraz University of Medical Sciences, archive files and clinical findings related to 3001 patients who had been referred to the Department of Oral Pathology during a 12-year period, were reviewed. The recorded information in files included age, sex, lesion's location, clinical and histopathological diagnoses, and specialty of dentists.

Results: Out of 3001 cases included and reviewed in this study, 2167 cases (72.2%) were consistent between clinical and histopathologic diagnoses. The highest frequency of oral lesions was found in the mandibular bone and the lowest one was in the floor of mouth. Age, sex, and clinician's specialty were indicated to have no significant effect on diagnosis ($p > 0.05$), but location and type of lesion affected that ($p < 0.05$). In regard to location, the highest consistency of clinical and histopathologic diagnoses was observed in mouth floor lesions and the lowest one was in gingival mucosa. In terms of lesion category, the highest and the lowest consistency rates belonged to white and red lesions and pigmented lesions, respectively.

Conclusions: The results of the present study show that the consistency of clinical and histopathological diagnoses was three times more than their inconsistency, and the accuracy of the clinicians was largely acceptable.

Background

The oral cavity is a complex area located in the head and neck regions and home to a diverse range of cysts, benign, and malignant salivary gland tumors, as well as odontogenic and non-odontogenic neoplasms [1, 2]. Both the diagnosis and treatment of oral cavity lesions are known as integral parts of oral health care [3]. Moreover, it is well understood that early detection and treatment of these lesions would greatly lead to the improvement of patient's survival rates and quality of life [4]. Although each oral lesion has different characteristics and clinical features aiding in diagnosis, clinical diagnosis errors occur due to the similarities in clinical presentations, lack of precise definitions for these characteristics, incompatibility of the signs and symptoms in patients, and the presence of multiple manifestations for a lesion [5, 6]. Therefore, in order to minimize misdiagnoses and to achieve more accurate ones, it is necessary to consider the patients' chief complaints, medical and dental histories' records, clinical manifestations, and various tests like paraclinical tests that include biopsies with microscopic evaluations and blood tests [6]. Histopathologic examination, which is known as the gold standard in diagnostic oral pathology, is used to confirm the clinical diagnosis [7]. However, Pathologists may encounter uncertainty during performing the histological examination on lesions under some

circumstances, because various lesions may exhibit comparable microscopic views. Thus, the clinical examination can be considered as an effective and important step for confirming pathology results and will also be quite useful in such situations [8]. Therefore, the initial clinical diagnosis made by clinicians must be accurate. Moreover, it should not miss any precancerous or malignant lesions and a close collaboration between the clinician and the pathologist is required in this regard, in order to reach a definitive and right diagnosis [2].

Various studies have previously investigated the compatibility of clinical and pathologic diagnoses and as a result, they reported compatibility rates approximately between 50 and 80% [3, 5–8]. Due to the reported discrepancy in the consistency rates between clinical and histopathological diagnoses in numerous studies performed in various places, the present study aimed to determine the rate of discrepancy between clinical and histopathological diagnoses. This research was done on the patients admitted to Shiraz dentistry school with the hope that the obtained results would help identifying weaknesses in the diagnosis of oral diseases and improving both diagnostic and treatment outcomes.

Methods

This retrospective study was performed in the Faculty of Dentistry, Shiraz University of Medical Sciences in terms of all relevant principles of the Helsinki Declaration. All the included subjects signed informed consent forms and the ethical approval was obtained from the ethics committee of Shiraz University of Medical Sciences, Shiraz. (IR.SUMS.DENTAL.REC.1398.123)

Data collection

This cross-sectional study was conducted on 3001 patients' archived files. For the purpose of this study, simple census sampling method was firstly used to select the eligible subjects and all the oral lesions diagnosed between January 2006 and December 2018 were then extracted from the archives existed in the Department of oral pathology. The exclusion criteria were the followings: records with inadequate information, inconclusive biopsies, and lesions in which a clinical impression was not given. In the patients' records, the following data were available: demographic data (age and gender), location of the lesion, and the clinical and pathological diagnoses of the lesions. All the included cases were subdivided into the following five groups:

1. Ulcerative, vesicular, and bullous lesions
2. Red and white lesions
3. Pigmented lesions
4. Exophytic lesions (which were divided into either excitatory or tumoral lesions)
5. Bone lesions (which were divided into either cystic or tumoral lesions)

This classification of lesions was done based on the reference book of oral diseases [9] (Burket's ORAL MEDICINE 12th edition). Finally, the obtained samples with a similar diagnosis using both techniques were recorded as the compatibility of clinical and pathological diagnoses.

Data Analysis

All the information obtained from the patients' records was analyzed by SPSS version 22 using chi-square tests. As well, descriptive statistics indices were used to calculate the absolute and relative frequencies of different lesions. All these tests were performed with a statistical significance level accepted at $p < 0.05$.

Results

A total of 3001 clinical files were evaluated in the current study. In 2167 cases (72.2%), the clinical and pathological diagnoses were compatible.

Age and sex:

Among all the biopsied cases, 1432 (47.7%) men and 1569 (52.3%) women were included. Moreover, 1058 male (73.9%) and 1109 (70.7%) female subjects had compatible diagnosis between clinical and pathological. In addition, 2708 (93.2%) cases were in the second decade of their life, so they were the most prevalent cases. The ninth and tenth decades had the most frequent clinical and histological consistency (100%) and the fifth decade had the least (51.6 %). Of note, there was no significant relationship among patients' age and sex, and consistency of clinical and histopathologic diagnoses. (P value > 0.05) (Tables 1, 2)

Table 1
Compatibility rate of clinical and histopathologic diagnosis based on gender

Sex	Total cases N (%)	Compatibility N (%)	Incompatibility N (%)	P value
Male	1432 (47.7%)	1058 (73.9%)	374 (26.1%)	0.05 < p value
Female	1569 (52.3 %)	1109 (70.7%)	460 (29.3%)	
N = Number				

Table 2
Compatibility rate of clinical and histopathologic diagnosis based on age ranges

Decade	Total cases	Compatibility N (%)	Incompatibility N (%)	P value
1	4	2 (50%)	2 (50%)	0.05 < p value
2	2797	2038 (72.6%)	769 (27.4%)	
3	54	37 (68.5%)	17 (31.5%)	
4	47	32 (68.1%)	15 (31.9%)	
5	31	16 (51.6%)	15 (48.4%)	
6	41	32 (78%)	9 (22%)	
7	18	12 (66.7%)	6 (33.3%)	
8	6	5 (83.3%)	1 (16.7%)	
9	2	2 (100%)	0 (0%)	
10	1	1 (100%)	0 (0%)	

Clinician's specialty:

Among the total subjects, 1428 (47.6%) cases were referred from oral & maxillofacial medicine and 1573 cases (52.4%) were from oral & maxillofacial surgery department. As well, 75% of the referrals from medicine department were consistent between clinical diagnosis and pathology, the rate of which was 69.7% for surgery department. No significant relationship was found between clinician's specialty and consistency of clinical and histopathologic diagnoses. (P value > 0.05) (Table 3)

Table 3
Compatibility rate of clinical and histopathologic diagnosis based on specialty of clinician

Clinician Specialty	Total	Compatibility N (%)	Incompatibility N (%)	P value
Oral medicine	1428	1071 (75%)	357 (25%)	0.05 < p value
Oral Surgeon	1573	1096 (69.7%)	477 (30.3%)	

Location:

Of the 12 documented biopsy sites, mandible was observed to be the most common one accounting for 770 (25.6%) cases, followed by the floor of the mouth accounting for the least biopsied sites with 27 biopsies and with the highest rate of compatibility (85.2%). Notably, the minimum rate of compatibility was found to be related to gingival lesions (66.1%). A significant relationship was also found between lesion's site and concordance of clinical and histological diagnoses. (P value < 0.05) (Table 4)

Table 4
Compatibility rate of clinical and histopathologic diagnosis based on location

Site of lesion	Total cases	Compatibility N (%)	Incompatibility N (%)	P value
Mandible	770	516 (67%)	254 (33%)	0.05 > p value
Maxilla	495	346 (69.9%)	149 (30.1%)	
Palate	122	83 (68%)	39 (32%)	
Alveolar mucosa	80	56 (70%)	24 (30%)	
Buccal mucosa	479	399 (83.3%)	80 (16.7%)	
Labial mucosa	151	124 (82.1%)	27 (17.9%)	
Ventral surface of tongue	38	27 (71%)	11 (28.9%)	
Dorsal surface of tongue	100	77 (77%)	23 (23%)	
Lateral surfaces of tongue	190	130 (68.4%)	60 (31.6%)	
Floor of mouth	27	23 (85.2%)	4 (14.8%)	
Gingiva	410	271 (66.1%)	139 (33.9%)	
Lip	139	115 (82.7%)	24 (17.3%)	

Categories of lesions:

As mentioned earlier, all the cases included in this study were divided into 5 categories. (Table 5) Exophytic lesions that were observed in 44.1% (n = 1326) cases, were the most common category of lesions. Biopsy of pigmented lesions was the least type by detecting only in 1.1% (n = 34) cases. Red and white lesions accounted for the highest rate of compatibility (86.1%) and the least rate belonged to pigmented lesions (47.1%). As well, a significant relationship was found between type of lesion and concordance of clinical and histological diagnoses (P value < 0.05). In this regard, the frequency and concordance rate of lesions in each category are shown in Tables 6.

Table 5
Compatibility rate of clinical and histopathologic diagnosis based on type of lesions

Category of lesion	Total cases	Compatibility N (%)	Incompatibility N (%)	P value
Ulcerative, vesicular, and bullous lesions	75	42 (56%)	33 (44%)	0.05 > p value
Red and white lesions	519	447 (86.1%)	72 (13.9%)	
Pigmented lesions	34	16 (47.1%)	18 (52.9%)	
Exophytic lesions	1326	893 (67.3%)	433 (32.7%)	
Bone lesions	1047	769 (73.5%)	277 (26.5%)	

Table 6
frequency and compatibility rate of clinical and histopathologic diagnosis in each category of lesions

Lesion	Total cases	Compatibility N (%)	Incompatibility N (%)
ulcerative, vesicular and bullous lesions			
Pemphigus Vulgaris	46	34 (73.9%)	12 (26.1%)
Pemphigoid	15	3 (20%)	12 (80%)
Eosinophilic ulcers	9	3 (33.3%)	6 (66.7%)
Traumatic ulcers	3	0 (0%)	3 (100%)
Aphthous	1	1 (100%)	0 (0%)
Erythema multiform	1	1 (100%)	0 (0%)
white and red lesions			
Liquen planus	449	398 (88.6%)	51 (11.4%)
Leukoplakia	63	49 (77.8%)	14 (22.2%)
Erythroplakia	4	0 (0%)	4 (100%)
lupus	2	0 (0%)	2 (100%)
Hairy Leukoplakia	1	0 (0%)	1 (100%)
pigmented lesions			
Melanotic macule	14	11 (78.6%)	3 (21.4%)
Hyperpigmentation	6	0 (0%)	6 (100%)
Nevus	6	2 (33.3%)	4 (66.7%)
Melanoacanthoma	4	2 (50%)	2 (50%)
Melanoma	3	1 (33.3%)	2 (66.7%)
Melanosis	1	0 (0%)	1 (100%)
Exophytic lesions[1]			

1. Exophytic lesions were subdivided into two subgroups: Excitatory and Tumoral lesions (malignant and benign tumors)

2. Bone lesions were subdivided into two subgroups: cystic and Tumoral lesions (malignant and benign tumors)

*Bone Samples which were not include in either cystic or tumoral lesion were named “other”.

Lesion	Total cases	Compatibility N (%)	Incompatibility N (%)
Excitatory lesions	**1100**	**742 (67.4%)**	**358 (32.6%)**
Fibroma	361	247 (68.4%)	114 (31.6%)
Pyogenic Granuloma	252	137 (54.4%)	115 (45.6%)
Mucocele	174	160 (91.9%)	14 (0.1%)
Epulis Fissuratum	125	109 (87.2%)	16 (12.8%)
Giant cell granuloma	124	57 (46%)	67 (54%)
Peripheral odontogenic fibroma	38	18 (47.4%)	20 (52.6%)
Epulis Granuloma	14	9 (64.3%)	5 (35.7%)
Neurofibroma	12	5 (41.7%)	7 (58.3%)
Benign Tumoral lesions	**83**	**43 (52%)**	**40 (48%)**
Papilloma	50	33 (66%)	17 (34%)
Pleomorphic adenoma	15	5 (33.3%)	10 (66.7%)
Lipoma	5	0 (0%)	5 (100%)
Schwannoma	5	1 (20%)	4 (80%)
Hemangioma	4	0 (0%)	4 (100%)
Traumatic neuroma	2	2 (100%)	0 (0%)
Lymphangioma	1	1 (100%)	0 (0%)
Basal cell adenoma	1	1 (100%)	0 (0%)
Malignant Tumoral lesions	**143**	**108 (75.5%)**	**35 (24.5%)**
Squamous cell carcinoma	132	104 (78.8%)	28 (21.2%)
Basal cell carcinoma	3	1 (33.3%)	2 (66.7%)
Lymphoma	3	0 (0%)	3(100%)
Mucoepidermoid carcinoma	3	1 (33.3%)	2 (66.7%)

1. Exophytic lesions were subdivided into two subgroups: Excitatory and Tumoral lesions (malignant and benign tumors)

2. Bone lesions were subdivided into two subgroups: cystic and Tumoral lesions (malignant and benign tumors)

*Bone Samples which were not include in either cystic or tumoral lesion were named “other”.

Lesion	Total cases	Compatibility N (%)	Incompatibility N (%)
Adenoid cystic carcinoma	2	2 (100%)	0 (0%)
Bone lesions[2]			
Cystic lesions	**861**	**669 (77.7%)**	**192 (22.3%)**
Radicular Cyst	420	358 (85.2%)	62 (14.8%)
Odontokeratocyst	184	115 (62.5%)	69 (37.5%)
Dentigerous cyst	173	134 (77.4%)	39 (22.6%)
Residual cyst	54	36 (66.7%)	18 (33.3%)
Nasopalatine cyst	18	18 (100%)	0 (0%)
Traumatic bone cyst	11	7 (63.6%)	4 (36.4%)
Aneurismal bone cyst	1	1 (100%)	0 (0%)
Benign Tumoral lesions	**133**	**71 (53.4%)**	**62 (46.6%)**
Giant cell granuloma	50	26 (52%)	24 (48%)
Ameloblastoma	33	16 (48.5%)	17 (51.5%)
Odontoma	15	13 (86.7%)	2 (13.3%)
Osteoma	11	7 (63.6%)	4 (36.4%)
Cementoblastoma	7	4 (57.1%)	3 (42.9%)
Adenomatoid odontogenic tumor	7	1 (14.3%)	6 (85.7%)
Central odontogenic tumor	1	1 (100%)	0 (0%)
Myxoma	7	3 (42.9%)	4 (57.1%)
Ameloblastic fibroma	1	0 (0%)	1 (100%)
Malignant Tumoral lesions	**14**	**9 (64.3%)**	**5 (35.7%)**
Osteosarcoma	11	6 (54.5%)	5 (45.5%)
Fibrosarcoma	2	2 (100%)	0 (0%)

1. Exophytic lesions were subdivided into two subgroups: Excitatory and Tumoral lesions (malignant and benign tumors)

2. Bone lesions were subdivided into two subgroups: cystic and Tumoral lesions (malignant and benign tumors)

*****Bone Samples which were not include in either cystic or tumoral lesion were named “other”.

Lesion	Total cases	Compatibility N (%)	Incompatibility N (%)
Chondrosarcoma	1	1 (100%)	0 (0%)
Other*	**39**	**20 (51.2%)**	**19 (48.8%)**
1. Exophytic lesions were subdivided into two subgroups: Excitatory and Tumoral lesions (malignant and benign tumors)			
2. Bone lesions were subdivided into two subgroups: cystic and Tumoral lesions (malignant and benign tumors)			
*Bone Samples which were not include in either cystic or tumoral lesion were named “other”.			

Discussion

In this study, the rate of agreement between the two clinical and histopathological diagnoses was examined, along with the prevalence of each biopsied lesion submitted to department of Oral Pathology, Shiraz dentistry school. Accordingly, these considerations are valuable for improving the existing knowledge about the perception and behavior of dentists and dental students regarding the necessity of performing the histopathological examination.

In the present study, the rate of clinicopathological agreement was obtained as 72.2%, which is similar to those obtained in studies by Saravani et al. [10] and Emamverdizadeh et al. [8] who calculated the overall compatibility rate as 70.1% and 72.3%, respectively. However, compared to the above-mentioned rates, the rates in the studies conducted by Tatli et al. [2] and Forman et al. [11] were higher (93.3% and 94.4%, respectively). In a study by Soyele et al. [12], clinicopathological reports of 592 biopsied cases during the period of 2008–2017 were retrieved and then analyzed. Accordingly, they recorded the concordance rate as 54.6%, which was similar to results of Poudel et al.’s study [7] (54.6%). These discrepancies could be due to remarkable differences in these studies’ methodologies such as the clinicians and the pathologists’ skills, the accuracy of biopsy, sample size, and conditions under which the specimens were transferred to the laboratory.

Based on the fact that some lesions occur more frequently in one sex or at certain ages, so it can be said that age or sex can be considered as one of the influential factors on making a better differential diagnosis. However, in the present study, no significant relationship was observed between compatibility rate and sex or age. These findings are in line with those of the Saravani et al.’s study [10]. However, in Forman et al.’s research [11], age was found to be significantly associated with accuracy between clinical and histologic diagnoses. Furthermore, in the current study, the highest compatibility rate was observed in the 9th and 10th decades of life, which is almost consistent with other similar reports, demonstrating that the highest percentage of agreement rate was in the 7th decade and older age [12–16]. The reason for the greater compatibility rate between clinical and pathological diagnoses in this age group may possibly be the loss of teeth, thereby the reduced number of odontogenic lesions and irritation associated with

them. Another reason might be the exclusion of lesions developing in children or young adults. Moreover, a slight increase might be found in some specific lesions such as denture-related lesions and other prevalent lesions, which consequently makes correct diagnosis of lesions easier. Despite the results of the present study, two previous studies [11, 12] have also observed a higher concordance index in women, while another study [2] has reported slightly higher discordance rates for the female patients' lesions compared to the male patients' ones.

Similar to the current study, Saravani et al. [10] have also found no relationship between compatibility of clinical and histopathological diagnoses and clinician's specialty in their study. However, in the study by Foroughi et al. [17], the highest and lowest compatibility rates between clinical and pathological diagnoses were achieved by oral medicine specialists (98%) and general dentists (71%), respectively.

The current study indicated that a significant relationship exists between lesion's site and concordance of clinical and histological diagnoses. But, no statistically significant relationship was observed between the compatibility of clinical and histopathological diagnoses of oral lesions in the Saravani et al.'s research [10]. Additionally, in the present study, mandibular bone lesions had the highest frequency of lesions and in soft tissue lesions, the highest frequency was found to be related to buccal mucosa and the lowest one was associated with ventral surface lesions of the tongue. These results are almost similar to those of the Saravani et al.'s study, indicating Mandibular bone lesions as the most frequent lesions and tongue as the least frequent one in oral cavity. In regard to agreement rate, gingival lesions and floor of mouth both had the minimum and maximum rates of compatibility in current study, respectively. Correspondingly, this finding may be due to the fact that several oral diseases have the same clinical manifestations in gingiva; for example, desquamative gingivitis can be seen in either ulcerative and vesiculobullous or white and red lesions, so it is not clinically distinguishable among these types of diseases. However, Foroughi et al. [17] and Hashemipour et al. [15] in their studies reported the most compatibility rate of clinical and histopathological diagnoses in gingiva. Furthermore, the lowest compatibility rate was observed in floor of the mouth, reported in the Hashemipour et al. and Saravani et al.'s studies. These contradictory findings in these studies may be due to variations in the sample size and the clinicians' knowledge and experiences.

The present study is unique as it, for the first time, examined a large number of studied biopsy samples and then classified all lesions into 5 categories of ulcerative, white and red, pigmented, exophytic, and bone lesions, which include almost all types of oral lesions. While other studies have mainly focused only on few specific lesions and a specific group [18–21]. According to the results of the current study, a statistically significant relationship exists between compatibility rate of the histopathological and clinical diagnoses and the type of lesions. Accordingly, this finding is in line with the results of the study by Saravani et al. [10] who found a significant relationship between type of lesion (either neoplastic or non-neoplastic) and clinicopathological agreement.

In this study, out of 5 general categories of lesions, the highest prevalence belonged to exophytic lesions, and white and red lesions had the highest consistency rate and pigmented lesions had the lowest rate. In

white and red lesions, oral liquen planus was the most commonly observed lesion and it also had the highest percentage of consistency (88.6%). Similarly, Fattahi et al. [13] in their study found the highest percentage of consistency for Lichen planus (100%), and in another study, Goyal et al. [20] found the Lichen planus as the most common lesion in oral mucosal lesions with the clinicopathological concordance rate of 91.4%.

After white and red lesions, the highest concordance rate belonged to in bone lesions, which were more frequent in cystic lesions compared to tumor lesions. In cystic bone lesions, radicular cyst was found as the most common lesion. Similarly, Fierro-Garibay et al. [22] in their research found periapical cysts as the most common lesion. Of note, the reason for the higher incidence of radicular cysts could be their origin secondary to dental caries and trauma. In the current study, in terms of compatibility rate, Nasopalatine and Aneurismal bone cysts had the highest rates of compatibility in cystic bone lesions, which may possibly be due to the less prevalence of these lesions, their specific radiological appearance, and the site of occurrence that make their diagnosis easier.

In this study, exophytic lesions were ranked in the third place in terms of consistency, in which the group of excitatory lesions with the highest frequency had the highest concordance rate. In these reactive lesions, Mucocele mostly have the highest clinical diagnosis. The reason for this high adaptation can be explained with the specific location and history presented by the patient with the filling and emptying of the mucosal lesion and the clinical picture. However, in terms of frequency, the most irritating lesions were found to be related to fibroma lesions, which is justifiable, because the oral cavity is normally subjected to numerous stimuli that can lead to the development of fibroma-irritated lesions in the oral mucosa. According to the findings of our study, squamous cell carcinoma was observed as the most malignant tumoral lesion with a concordance rate of 79%. In line with this finding, several studies have also reported this lesion as the most common form of oral malignancies in South Asia [23, 24].

In both ulcerative and vesiculobullous lesions, we found Pemphigus vulgaris as the most frequent oral condition with a concordance rate of approximately 74%. However, compared to the results of the study by Goyal et al. [20], a higher percentage of agreement exists between clinical and histopathological diagnoses of pemphigus vulgaris (as 94.%). These inconsistent findings may possibly be due to differences in subjects and the clinicians' knowledge and experiences.

As stated earlier, several investigations conducted on the compatibility of clinical and pathological diagnoses have reported varying compatibility rates as their results. Patients may suffer from irreversible harms as results of incorrect diagnosis. For example, poor treatment of malignant tumors with clinical features that resemble benign lesions might consequently result in serious implications for the patient, including death. Since the correct clinical or pathological diagnosis of lesions is closely linked to both knowledge and educational level of clinicians, it is critical to redesign students' educational programs totally and then improve them. In order to avoid diagnostic errors, physicians and dentists should also take thorough histories of patients and then transmit them to pathologists, besides following proper and standard procedures when taking biopsies.

Limitations

One of the limitations of this study was sampling process performed in a single pathology center. Another limitation of the study was incomplete patients' records.

Conclusion

The results of the present study indicate that there is an agreement between the clinical and pathological diagnoses of the lesions in more than 70% of cases, but unfortunately, incompatibility still exists regarding some lesions, which is not negligible. So, it should be noted that the clinicopathological consistency rate will never reach 100%, because there are lesions that have the same clinical appearance and different histopathology, and in many of them, the definitive diagnosis is still based on the histopathological results. Therefore, to avoid misdiagnosis and improper treatment, all dental specialists should be informed and aware of the importance of sending all excised specimens for performing histological investigations. Multidisciplinary, clinico-pathological training programs and lectures should also be held at dental centers and schools, in order to minimize diagnostic discordance rates among different dental specialties.

Declarations

Ethics approval and consent to participate

Informed consent was obtained from all patients. If the subject was under 18, the informed consent was obtained from the parent and/or legal guardian to access to their document. This research project was approved by the Ethics Committee of Shiraz University of Medical Sciences, Shiraz, Iran. (IR.SUMS.DENTAL.REC.1398.123)

Consent for publication

Not applicable

Availability of data and materials

The datasets analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Funding

The Vice-Chancellor of Shiraz University of Medical Science supported this research (Grant≠18217).The funders had no role in the design of the study and collection, and analysis, interpretation of data or

preparation of the manuscript. The report of the study's findings is sent by the authors to funder at the end of the study.

Authors' contributions

AR developed the initial concept of study. ST contributed to the study design and MSN gathered the data and AA and FR supervised the data collection. GF wrote the manuscript and helped with data analysis and interpretation. All authors revised and approved the final manuscript.

Acknowledgements

This article is based on the thesis by Mehdi Sasan Nia from dental school of Shiraz university of medical Science and was financially supported by Shiraz University of Medical Sciences grants No. 18217.

References

1. Saghravanian N, HosseinpourJajarm H, Salehinejad J, AfzalAghaie M, Ghazi N. A 30-Year Comparison of Clinical and Histopathological Diagnoses in Salivary Gland Lesions, Odontogenic Cysts and Tumors in Mashhad Dental School-Iran. Journal of Mashhad Dental School. 2010;34(4):299-308.
2. Tatli U, Erdoğan Ö, Uğuz A, Üstün Y, Sertdemır Y, Damlar İ. Diagnostic concordance characteristics of oral cavity lesions. The Scientific World Journal. 2013;2013.
3. Patel KJ, De Silva HL, Tong DC, Love RM. Concordance between clinical and histopathologic diagnoses of oral mucosal lesions. Journal of Oral and Maxillofacial Surgery. 2011;69(1):125-33.
4. Sciubba JJ. Oral cancer. American journal of clinical dermatology. 2001;2(4):239-51.
5. Kondori I, Mottin RW, Laskin DM. Accuracy of dentists in the clinical diagnosis of oral lesions. Quintessence International. 2011;42(7).
6. Sarabadani J, Ghanbariha M, Khajehahmadi S, Nehighalehno M. Consistency rates of clinical and histopathologic diagnoses of oral soft tissue exophytic lesions. Journal of dental research, dental clinics, dental prospects. 2009;3(3):86.
7. Poudel P, Upadhyaya C, Humagain M, Srii R, Chaurasia N, Dulal S. Clinicopathological Analysis of Oral Lesions-A hospital based retrospective study. Kathmandu Univ Med J. 2019;68(4):311-5.
8. Emamverdizadeh P, Arta SA, Ghanizadeh M, Negahdari R, Ghavimi MA, Ghoreishizadeh A, et al. Compatibility of clinical and histopathological diagnosis of oral lesions in Iranian patients. Pesquisa Brasileira em Odontopediatria e Clínica Integrada. 2019;19.
9. Glick M. Burket's oral medicine: PMPH USA; 2015.
10. Saravani S, Tavakoli Amin M, Kadeh H. Compatibility Rate of Clinical and Histopathologic Diagnosis of Oral Lesions in Zahedan Dental School during 1999-2015. Journal of Dental Materials and Techniques. 2016;5(3):138-44.

11. Forman MS, Chuang S-K, August M. The accuracy of clinical diagnosis of oral lesions and patient-specific risk factors that affect diagnosis. Journal of Oral and Maxillofacial Surgery. 2015;73(10):1932-7.
12. Soyele OO, Aborisade A, Adesina OM, Olatunji A, Adedigba M, Ladeji AM, et al. Concordance between clinical and histopathologic diagnosis and an audit of oral histopathology service at a Nigerian tertiary hospital. The Pan African Medical Journal. 2019;34.
13. Fattahi S, Vosoughhosseini S, Khiavi MM, Mostafazadeh S, Gheisar A. Consistency rates of clinical diagnosis and histopathological reports of oral lesions: a retrospective study. Journal of dental research, dental clinics, dental prospects. 2014;8(2):111.
14. Deyhimi P, Ferdowsi M. CORRESPONDENCE OF CLINICAL DIAGNOSIS WITH HISTOPATHOLOGIC DIAGNOSIS OF ORAL LESIONS IN PATIENTS REFERRING TO ORAL PATHOLOGY DEPARTMENT OF ISFAHAN DENTISTRY SCHOOLFROM 1370 TO 79. 2004.
15. Hashemipour M, Rad M, Mojtahedi A. A comparative study of clinical diagnosis and histological reports of oral and jaw lesions. Journal of Dentistry. 2009;10(1):31-7.
16. Jaafari Ashkavandi Z, Rezvani G, Mardanifard H. Evaluation of the agreement rate of clinical and histopathologic diagnosis in patients referring to oral pathology department of Shiraz Dental School, 2001-2006. Journal of Dentistry. 2010;11(2):161-8.
17. Foroughi R, Seyedmajidi M, Bijani A, Omid Dezyani M. Comparison of clinical diagnosis and histopathological report of referred biopsies to oral and maxillofacial pathology department of dental school of Babol, Iran (2003-2010). Journal of Babol University of Medical Sciences. 2013;15(6):71-7.
18. Alotaibi O, Alswayyed S, Alshagroud R, AlSheddi M. Evaluation of concordance between clinical and histopathological diagnoses in periapical lesions of endodontic origin. Journal of Dental Sciences. 2020;15(2):132-5.
19. Dutra KL, Longo L, Grando LJ, Rivero ERC. Incidence of reactive hyperplastic lesions in the oral cavity: a 10 year retrospective study in Santa Catarina, Brazil. Brazilian journal of otorhinolaryngology. 2019;85:399-407.
20. Goyal V, Singla R. A clinical and histopathological study on the oral mucosal lesions in common dermatological disorders. Journal of Clinical and Diagnostic Research. 2011;5(8):1578-81.
21. Rad M, Hashemipoor MA, Mojtahedi A, Zarei MR, Chamani G, Kakoei S, et al. Correlation between clinical and histopathologic diagnoses of oral lichen planus based on modified WHO diagnostic criteria. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology. 2009;107(6):796-800.
22. Fierro C, Almendros Marqués N, Berini Aytés L, Gay Escoda C. Prevalence of biopsied oral lesions in a Department of Oral Surgery (2007-2009). 2011.
23. Gupta N, Gupta R, Acharya AK, Patthi B, Goud V, Reddy S, et al. Changing Trends in oral cancer-a global scenario. Nepal journal of epidemiology. 2016;6(4):613.

24. Warnakulasuriya S. Global epidemiology of oral and oropharyngeal cancer. Oral oncology. 2009;45(4-5):309-16.