Research Article

Submitted: Mar 21, 2023
Accepted: Jul 10, 2023
Published: Aug 21, 2023

Clinicopathological Agreement of Oral Keratotic Lesions: A Descriptive Cross-sectional Study

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ABSTRACT

Introduction: Oral white lesions are one of the most frequently diagnosed lesions of oral cavity. These lesions, though aetiologically different, may appear clinically similar. However, they vary remarkably in histopathological findings ranging from benign hyperkeratosis to invasive malignancy.

Objective: To determine the agreement between clinical and histopathological diagnoses of oral keratotic lesions

Materials and Method: A descriptive cross-sectional study using secondary data was carried out at Kantipur Dental College from 2022 March-April after ethical approval. The study included 112 clinically diagnosed cases of oral keratotic lesions subjected to biopsy and histological examination by convenience sampling. Cases of both incisional and excisional biopsies with complete clinical and histopathological records were included. Cases diagnosed clinically with mixed red and white lesions**,** histopathologically diagnosed cases of follow-up, overlapping of multiple oral lesions, and biopsy forms with inadequate clinical details were excluded. Measure of agreement between clinical and histopathological diagnoses was assessed using Microsoft Excel 2019 and SPSS v.20.

Result: The most common histological diagnosed cases were of oral lichen planus (OLP): 41 (36.60%), oral submucous fibrosis (OSMF): 19 (16.96%), and leukoplakia which is histopathologically diagnosed as dysplasia: 15 (13.39%). Of 32 clinical cases of leukoplakia, clinicopathological agreement was only nine (28.12%), four (12.50%), was diagnosed as OSMF, and two (6.25%) was diagnosed as carcinoma whereas 17 (53.13%) cases were diagnosed as other keratotic lesions indicating the least clinicopathological agreement.

Conclusion: Measure of agreement between clinical and pathological diagnoses was variable among different oral keratotic lesions suggesting confirmation with histopathology as a must.

Keywords: Biopsy; histological examination; keratosis; leukoplakia; oral lichen planus; oral submucous fibrosis.

INTRODUCTION

The oral white lesion stands out as one of the most regularly diagnosed lesions of the oral cavity. Some of these can be removed by scraping and are referred to as "non-keratotic" while the white lesions resisting removal by scraping are referred to as "keratotic".[1]

Citation

Badhu A, Bajracharya D, Ojha B, Bhandari P, Manandhar DK, Maharjan N. Clinicopathological agreement of oral keratotic lesions: a descriptive cross-sectional study. J Nepal Dent Assoc. 2023 Jan-Jun;23(36):9-15.

Some white lesions may also occur due to an increased keratinisation due to friction or repeated trauma or chronic irritation and may histologically show hyperkeratosis. White non-scrapable lesions include linea alba, leukoedema, frictional keratosis, leukoplakia which is histologically diagnosed as dysplasia, oral submucous fibrosis (OSMF), oral lichen planus (OLP), and carcinomas.

Some of these keratotic lesions may have similar clinical appearance but can have a considerable degree of microscopic heterogeneity ranging from benign hyperkeratosis to epithelial dysplasia and frank invasive malignancy.[2] Although these lesions often grow slowly and steadily, they can also exhibit an invasive nature, therefore, biopsy and histopathological examination are essential to prevent misdiagnosis of these lesions.[3]

There might also be a difference between the clinicopathological consistency rates which can be explained by differences in proficiency of the clinician and the pathologist, accuracy of the biopsy, manner of transfer to the laboratory, fit cut of sample and attention and quality of clinician–pathologist co-operation.[2]

MATERIALS AND METHOD

This was a descriptive cross-sectional study conducted from 2022 March to 2022 April by the Department of Oral and Maxillofacial Pathology of Kantipur Dental College and Hospital, Basundhara, Kathmandu, Nepal after obtaining the ethical clearance from institutional review committee (Ref. 9/022). The study sample was calculated using the formula:

$$n = Z^2pq/e^2$$

$$= 100.04 \approx 101;$$

where, Z = 1.96, the standard normal deviate corresponding to 95% confidence level; p = prevalence = 0.07 (7.2% malignant lesion commonly seen in vestibular region);[4] q = 1-p = 0.93; e = 0.05 (5% margin of error). After taking into account, about 10% possible errors during the study, the final sample size calculated was = 101 + 10.1 = 111.1 ≈ 112. Both clinically and histologically diagnosed cases of oral keratotic lesions obtained from the archives of the department were included following the convenience sampling technique. Both the biopsy form with clinical diagnosis (CD) and their histopathological reports were reviewed and recorded in Microsoft Excel Spreadsheet 2019.

The cases of both incisional and excisional biopsies with complete clinical and histopathological records were taken. Patients diagnosed clinically with mixed red and white lesions, histopathologically diagnosed cases of follow-up, overlapping of multiple oral lesions and biopsy forms with inadequate clinical details were excluded. Assessment of variables was performed based on the distribution of samples using IBM SPSS Statistics for Windows, version 20 (IBM Corp., Armonk, N.Y., USA). Frequency tables were generated for assessing the clinicopathological diagnostic agreement.

RESULT

A total of 112 cases were reviewed and 12 different oral lesions have been categorised. Demographic data indicated keratotic lesions affected patients from age group 14-72 years among which 72 (64.28%) were males and 40 (35.72%) were females.

Oral lichen planus had the highest prevalence of 34 (30.35%) and 41 (36.60%) followed by oral submucous fibrosis both clinically (12, 10.71%) and histopathologically (19, 16.96%) among all the other lesions examined (Table 1).

On comparison, the clinical and histopathological diagnosis (HPD) of OSMF had the highest agreement (11, 91.66%) followed by OLP (31, 91.17%) (Table 2).

An interesting finding from the data of the histopathologically diagnosed cases with lack of agreement with the clinical diagnosis showed that one clinically diagnosed case of OSMF was histopathologically confirmed as oral squamous cell carcinoma (OSCC). Similarly, three clinically diagnosed cases of verrucous hyperplasia were confirmed histopathologically as verrucous carcinoma (Table 3).

The most variable clinicopathological agreement was seen in leukoplakia. Out of the total 32 clinically diagnosed cases only nine (28.13%) of the case were confirmed histopathologically as dysplasia, four (12.50%) as OSMF, and two (6.25%) as OSCC (Figure 1). Further, histopathological categorisation revealed 6% as mild, 5.4% as moderate, and 0.9% as severe dysplasia.

The keratotic lesions were present most commonly on the buccal mucosa 61 (54.46%), followed by the gingiva 20 (17.85%), and tongue 14 (12.50%) (Figure 2).

Table 1: Clinical diagnosis and histopathological diagnosis of the cases, n (%).

S. N.	Lesion type	Clinical diagnosis	Histopathological diagnosis
1	Oral lichen planus	34 (30.35)	41 (36.60)
2	Leukoplakia/dysplasia	32 (28.57)	15 (13.39)
3	Oral submucous fibrosis	12 (10.71)	19 (16.96)
4	Keratosis	11 (9.82)	12 (10.71)
5	Verrucous hyperplasia	7 (6.25)	7 (6.25)
6	Leukoplakia with oral submucous fibrosis	6 (5.35)	6 (5.35)
7	Tobacco pouch keratosis	4 (3.57)	-
8	Lichenoid reaction	3 (2.67)	2 (1.78)
9	Verrucous carcinoma	2 (1.78)	5 (4.46)
10	White sponge naevus	1 (0.89)	-
11	Oral squamous cell carcinoma	-	4 (3.57)
12	Verrucous xanthoma	-	1 (0.89)
	Total	112	112

Table 2: Agreement between clinical diagnosis and histopathological diagnosis, n (%).

S. N.	Lesion Type	Cases based on clinical diagnosis	Clinically diagnosed cases matching with histopathological diagnosis	Clinically diagnosed cases not matching with histopathological diagnosis
1	Oral lichen planus	34 (30.35)	31 (91.17)	3 (8.82)
2	Leukoplakia/dysplasia	32 (28.57)	9 (28.12)	23 (71.87)
3	Oral submucous fibrosis	12 (10.72)	11 (91.66)	1 (8.33)
4	Keratosis	11 (9.83)	5 (45.45)	6 (54.54)
5	Verrucous hyperplasia	7 (6.25)	4 (57.14)	3 (57.14)
6	Leukoplakia with oral submucous fibrosis	6 (5.35)	2 (33.33)	4 (66.66)
7	Tobacco pouch keratosis	4 (3.57)	1 (25)	3 (75)
8	Lichenoid reaction	3 (2.67)	2 (66.66)	1 (33.33)
9	Verrucous carcinoma	2 (1.78)	1 (50)	1 (50)
10	White sponge naevus	1 (0.89)	-	1 (100)
	Total	112	66	46

Table 3: Histopathological diagnosis of non-correlating cases.

S. N.	Clinical diagnosis		Histopathological diagnosis									
		Total cases	OLP	Dysplasia	OSMF	Hyperkeratosis	Verrucous hyperplasia	Lichenoid reaction	OSCC	Verrucous xanthoma	Dysplasia With OSMF	Verrucous carcinoma
1	OLP	3	-	2	-	1	-	-	-	-	-	-
2	Dysplasia	23	5	-	4	5	2	-	2	1	3	1
3	OSMF	1	-	-	-	-	-	-	1	-	-	-
4	Keratosis	6	4	1	-	-	-	-	-	-	1	-
5	Verrucous hyperplasia	-	-	-	-	-	-	-	-	-	-	3
6	Leukoplakia with OSMF	-	-	1	3	-	-	-	-	-	-	-
7	Tobacco pouch keratosis	-	-	2	1	1	-	-	-	-	-	-
8	Lichenoid reaction	1	-	-	-	-	-	-	-	-	-	-
9	Verrucous carcinoma	2	-	-	-	-	-	-	1	-	-	1
10	White sponge naevus	-	-	-	-	1	-	-	-	-	-	-
Total		36	9	6	8	8	2	0	3	1	1	5

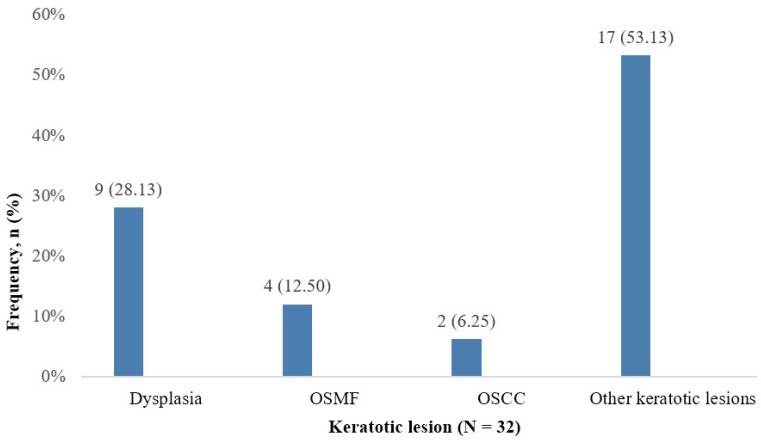

Figure 1: Variation in the histopathological diagnosis of leukoplakia, n (%).

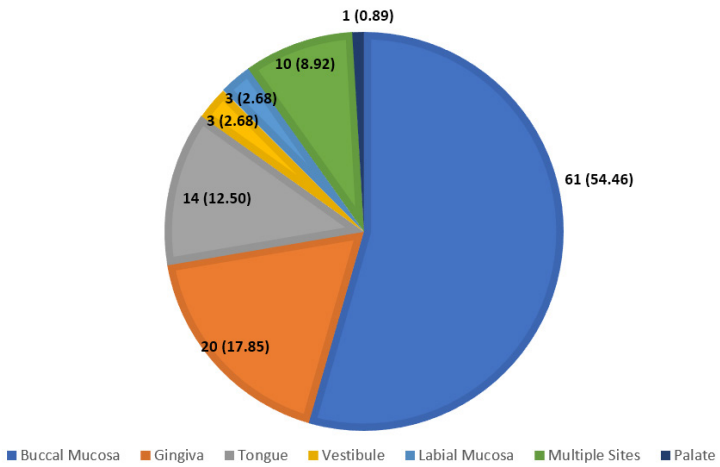

Figure 2: Distribution based on location, n (%).

DISCUSSION

A wide spectrum of lesions affects the oral cavity ranging from a simple benign fibroma to malignant carcinoma. Out of the various oral lesions, keratotic lesions account for one of the most frequently diagnosed cases. The majority of white lesions includes benign frictional keratoses or keratoses from inflammatory conditions like lichen planus and lichenoid reactions while leukoplakia and OSMF are marked as potentially malignant. Correct recognition of these lesions both clinically and histologically is crucial because of their premalignant potential and requires appropriate management accordingly.[5]

Among all the lesions included in this study, oral lichen planus was the most common diagnosis clinically (34 out of 112, 30.35%) as well as histopathologically (41 out of 112, 36.60%) and also had the second highest clinicopathological agreement (31 out of 34, 91.17%) (Tables 1, 2). This finding was similar to the results of a similar study by Simi et al.[6] (72%), and Bukhari et al.[7] where 37.5% were OLP out of the total 80 cases. The reason for the higher agreement in OLP may be due to specific clinical presentation of OLP as five subtypes namely reticular, plaque-like, atrophic, erosive-ulcerative, and bullous type along with bilateral occurrence commonly unlike other lesions.[8]

Another frequently diagnosed oral keratotic lesion is the oral leukoplakia which presents as a white patch or plaque that cannot be described as any other definite lesion both clinically and histopathologically. The prevalence of this lesion has been reported to be around only 2.6% in the general population and is considered as one of the most frequent potentially malignant lesions of the oral mucosa in our country.[9] In context to findings of this study, 32 (28.57%) and 15 (13.39%) of leukoplakia cases were reported clinically and histopathologically respectively (Table 1). This discrepancy might be due to the fact that leukoplakia is used only as a clinically diagnostic term which does not have a certain histopathological presentation leading to lower agreement clinicopathologically.[10] Further, histopathological categorisation revealed 6% as mild, 5.4% as moderate, and 0.9% as severe dysplasia. In contrast, in a study by Gurung et al.,[1] out of 61 cases 17 (27%) showed dysplasia of which 19% was mild, 5% was moderate and 3% was severe dysplasia.

Recognising the lesion's location is crucial since tobacco placement sites are more likely to have keratotic lesions, which enhance the mucosa's susceptibility to cancerous alterations. In addition to adverse habits, chronic trauma from a persistent local irritant like sharp tooth or prosthesis, or use of caustic chemicals may also lead to hyperkeratosis.[10] The tongue followed by buccal mucosa among other intraoral sites showed the highest involvement in the Nepali patients with OSCC.[9] In this study buccal mucosa was the most common site (61, 54.46%), followed by the gingiva (20, 17.85%), tongue (14, 12.50%), and the palate was the least involved site one (0.89%) whereas in contrast the dorsum of tongue with (14, 28%) cases was the second common after buccal mucosa with 38 (76%) cases in the study of Simi et al.[6]

The current study demographic data showed male predilection with 71 (63.4%) males and 39 (34.8%) females. The youngest case was a 14-year-old male clinically diagnosed with white sponge naevus and histopathologically diagnosed as hyperkeratosis with dysplasia, while the oldest patient was a 72 years female clinically diagnosed as verrucous leukoplakia and histopathologically diagnosed as verrucous carcinoma. The patients in their fourth and fifth decades of life were most affected with these lesions, which was similar to the findings of a relatable study conducted by Rad et al.[11] with mean age of 46.19±13.91 years and Fatahi et al. with mean age of 42 years.[12]

Oral squamous cell carcinoma which is the most alarming among all other previously mentioned lesions usually shows some typical clinical presentations as an indurated ulcer, exophytic growth, indurated non-ulcerative patch (endophytic), or a combination of the above appearances and despite this fact it may be often misdiagnosed.[13] A benign or innocent appearing lesion clinically may present an aggressive picture under the microscope, so was the scenario in current study, where three (2.67%)

histopathologically diagnosed OSCC cases which were clinically diagnosed as leukoplakia and OSMF.

Another significant finding was three (2.67%) histopathological cases of verrucous carcinoma which were diagnosed clinically as leukoplakia and verrucous hyperplasia since supporting the fact that clinicopathological correlation is must verrucous carcinoma also presents as an asymptomatic, diffuse, well-demarcated, thick white plaque with papillary or verruciform projections on the surface of the lesions with the tendency to affect any part of the oral mucosa and is considered as a forerunner of squamous cell carcinoma.[14]

The limitation of the study could be small sample size, single centre study, and short data collection period.

CONCLUSION

The findings of this study show that a variable agreement existed between the clinical and histopathological diagnosis as any keratotic lesion may that may appear benign clinically may be a dysplastic or malignant lesion histopathologically. Therefore, both clinical and pathological diagnoses hold significant value in treatment planning and diagnostic correlation is a must.

ACKNOWLEDGEMENT

The authors would like to thank Dr. Sujita Shrestha and Dr. Sunita Shrestha, Department of Community Dentistry, Kantipur Dental College and Hospital, for their guidance in the statistical analysis of this study and Dr. Sushmit Koju for his constant support throughout the study period.

Conflict of interest

This study has been presented as paper at the first Nepalese Association of Oral Maxilofacial Pathologists Conference on 2022 April 22, Kathmandu, Nepal.

REFERENCES

1. Gurung P, Sherchan JB, Pai K. Histopathological based retrospective study of oral keratotic white lesions in manipal health systems-hospital. Scientific World. 2012;10(10):70-6. [Full Text | DOI]
2. Patel KJ, De Silva HL, Tong DC, Love RM. Concordance between clinical and histopathologic diagnoses of oral mucosal lesions. J Oral Maxillofac Surg. 2011;69(1):125-33. [PubMed | Full Text] | DOI]
3. Abidullah M, Raghunath V, Karpe T, Akifuddin S, Imran S, Dhurjati VNN, et al. Clinicopathologic correlation of white, non scrapable oral mucosal surface lesions: A study of 100 cases. J Clin Diagn Res. 2016;10(2):ZC38-41. [PubMed | Full Text | DOI]
4. Bajracharya D, Gupta S, Ojha B, Baral R. Prevalence of oral mucosal lesions in a tertiary care dental hospital of kathmandu. J Nepal Med Assoc. 2017;56(207):362-6. [PubMed | Full Text]
5. Villa A, Woo SB. Leukoplakia - A diagnostic and management algorithm. J Oral Maxillofac Surg. 2017;75:723-34. [PubMed | Full Text | DOI]
6. Simi S, Nandakumar G, Anish TS. White lesions in the oral cavity: A clinicopathological study from a tertiary care dermatology centre in kerala, india. Indian J Dermatol.2013;58(4):269-74. [PubMed | Full Text | DOI]
7. Bukhari SS, Gupta V, Dogra DR, Goswami KC, Ahmed A, Rather MI. Clinicohistopathological correlation of oral lesions. Int J Contemp Med Res. 2017;4(6):1398-1401. [Full Text]
8. Boñar-Alvarez P, Sayáns MP, Garcia-Garcia A, Chamorro-Petronacci C, Gándara-Vila P, Luces-González R, et al. Correlation between clinical and pathological features of oral lichen planus: A retrospective observational study. Medicine (Baltimore). 2019;98(8):e14614. [PubMed | Full Text | DOI]
9. Gajurel R, Gautam DK, Pun CB, Dhakal HP, Petrovski BE, Costea DE, et al. Trends and clinicopathological characteristics of oral squamous cell carcinomas reported at a tertiary cancer hospital in nepal during 1999 to 2009. Clin Exp Dent Res. 2020;6:356-62. [PubMed | Full Text | DOI]

10. Torabi M, Afshar MK, Afshar HM, Mohammahzadeh I. Correlation between clinical and histopathologic diagnosis of oral potentially malignant disorder and oral squamous cell carcinoma. Pesqui Bras Odontopediatria Clín Integr. 2021 Apr 30;21. [Full Text | DOI]
11. 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 Surg Oral Med Oral Pathol Oral Radiol Endod. 2009;107(6):796-800. [PubMed | Full Text | DOI]
12. Fattahi S, Vosoughhosseini S, Khiavi MM, Mostafazadeh S, Gheisar A. Consistency rates of clinical diagnosis and histopathological reports of oral lesions: A retrospective study. J Dent Res Dent Clin Dent Prospects. 2014;8(2):111-3. [PubMed | Full Text | DOI]
13. Deshmukh V, Shekar K. Oral squamous cell carcinoma: Diagnosis and treatment planning. Oral and maxillofacial surgery for the clinician. 2021:1853-67. [Full Text]
14. Mortazavi H, Safi Y, Baharvand M, Jafari S, Anbari F, Rahmani S. Oral white lesions: An updated clinical diagnostic decision tree. Dent J (Basel). 2019;7(1):15. [PubMed | Full Text] | DOI]