

Comparison between the clinical and pathological diagnosis of white patches in oral cavity among patient attending teaching clinics - College of Dentistry, University of Basrah, Iraq

*By Oula Fouad Hameed*

**7**  
**Comparison between the clinical and pathological diagnosis of white  
patches in oral cavity among patient attending teaching clinics -  
19  
College of Dentistry, University of Basrah, Iraq**

Oula Fouad Hameed\*, Ghaydaa Hashim Badri, Suroor Ali Jabbar

**4**  
Department of Oral Diagnosis, College of Dentistry, University of Basrah, Iraq

**\*Corresponding authors**

**Oula Fouad Hameed**

[medicalresearch77@yahoo.com](mailto:medicalresearch77@yahoo.com)

## ABSTRACT

**Background.** Oral white lesions may arise from the presence of a thicker coating of keratin or the buildup of non-keratinized substances. Thus, when a physician encounters a white spot on the oral mucosa, the initial concern is to determine if it can be removed by using a piece of gauze or not. The objective was to analysis the agreement between the clinical and pathological diagnosis of white lesions in the oral cavity. Methods: A total of 22 clinical reports of patients with oral white lesions were diagnosed both clinically and histopathological. The clinical and histological diagnoses were then compared. This study was done in the department of oral diagnosis in our College of Dentistry, University of Basrah \_ Iraq, from October 2014 to April 2022.

**Results.** Among 22 cases, 11(50%) were males and 11(50%) were female with average age of 34-69 years. Buccal mucosa was involved in major part of cases (30.6%) floor of mouth(5.6%) dorsum of tongue (8.3%) lateral part of tongue (2.8%).

**Conclusions.** The results of this study suggest that there is a low level of agreement between the clinical and histological diagnoses. Therefore, enhancing diagnostic abilities is crucial for enhancing therapy results.

**Key words:** oral white lesion, lichen planus, biopsy, leukoplakia

## Introduction

Oral white lesions are frequently observed. The majority of these lesions exhibit a white appearance as a result of atypical keratin deposition and the presence of saliva in the oral cavity [1-5]. Oral white lesions can be categorized as either benign, pre-malignant, or malignant [1,6]. These lesions can be diagnosed using a combination of patient history, clinical examination, and histological testing [1,7,8]. The global prevalence of oral cavity lesions increased from 2.45% to 4.31% over a ten-year period, namely from 1994 to 2004 [8].

Discrepancies ranging from 17% to 42% have been found in the published literature concerning clinicohistopathologic association of various oral lesion types. The clinicopathologic correlation of oral lesions might vary due to several factors, such as the selection of the most suitable area for histopathology and the variation in the percentage and type of patients across different studies. The disparity is also influenced by the subjective variance of the doctor and a histopathologist. Strict clinical and histological criteria are necessary for accurate diagnosis [9].

Oral white lesions are commonly observed during clinical examinations. These lesions manifest as white patches in the oral cavity. The oral mucosa may exhibit a white look as a result of various circumstances. Stimulation of the oral epithelium can lead to an augmented production of keratin,

resulting in hyperkeratosis. The presence of aberrant keratin allows for the uniform reflection of light, which is due to the continuous exposure of the hyperkeratotic tissue to saliva [10]. Acanthosis refers to the abnormal yet harmless thickening of the stratum spinosum. Additionally, the buildup of fluid within and outside the epithelium might lead to a clinical whitening effect. Exposure of the oral mucosa to toxic substances can lead to necrosis of the oral epithelium, which may manifest as a white lesion. Microorganisms, namely fungus, could generate pale-colored pseudomembranous composed of shed epithelial cells, fungal mycelium, and neutrophils. These pseudomembranous are only loosely connected to the oral mucosa [11].

White lesions in the oral cavity are frequently observed and can have several causes, some of which may be linked to dermatological conditions [12]. Some cases of oral white patches may be attributed to local factors such as material alba and furred tongue (accumulated waste due to inadequate oral hygiene), burns, keratoses, skin transplants, and scars. Additional factors that can contribute to this condition include congenital conditions like Fordyce spots and leukoedema, as well as inflammatory reasons such as infections like fungal (e.g., pseudomembranous, and hyperplastic candidiasis), viral (hairy leukoplakia), and bacterial (syphilitic mucous patches). Non-infectious causes include conditions like Lichen planus and lupus erythematosus [13]. Commonly encountered oral white lesions include hyperkeratosis (frictional keratosis), oral lichen planus, leukoplakia, pseudomembranous candidiasis, and squamous cell carcinoma [14].

The aim are to assess the clinicopathological correlation and patterns, agreement diagnosis, and impart a positive influence on the need to realize that biopsy followed by histopathological analysis is required for almost all of the white oral lesions.

## Methods

This retrospective study carried out from October 2014 to April 2022 with record of 22 biopsies from patients with oral white lesion diagnosed in histopathology laboratory in College of Dentistry, University of Basrah. The data analyzed regarding the age, sex of the patient, the type of lesion, site and the distribution of the lesions. Information was broken down by clear insight, utilizing SPSS form 20.

## Results

In this study there was 22 patients included, 11(50%) of them were females and the other 11 (50%) were males, their age ranged from (27 - 80) with mean age of  $52.5 \pm 12.3$  years. The majority of patients were those between 40-59 years old (50.0%) followed by those above 60 years (36.4%). Most of patients had a negative past medical history (81.8%) while only two patients had hypertension (9.2 %) and the other two (one had anemia and one had diabetes mellitus). Regarding

the smoking habit, majority of them were non- smoker (81.8%) and only 4 patients were smokers. (Table 1).

Table 1 : Variables of the study

Variables		No.	%
Sex	Male	11	50.0
	Female	11	50.0
Age	<40	3	13.6
	40-59	11	50.0
	≥60	8	36.4
Past medical history	Anemia	1	4.5
	Diabetes mellitus	1	4.5
	Hypertension	2	9.2
	No history	18	81.8
Smoking habit	Smoker	4	18.2
	Non-smoker	18	81.8

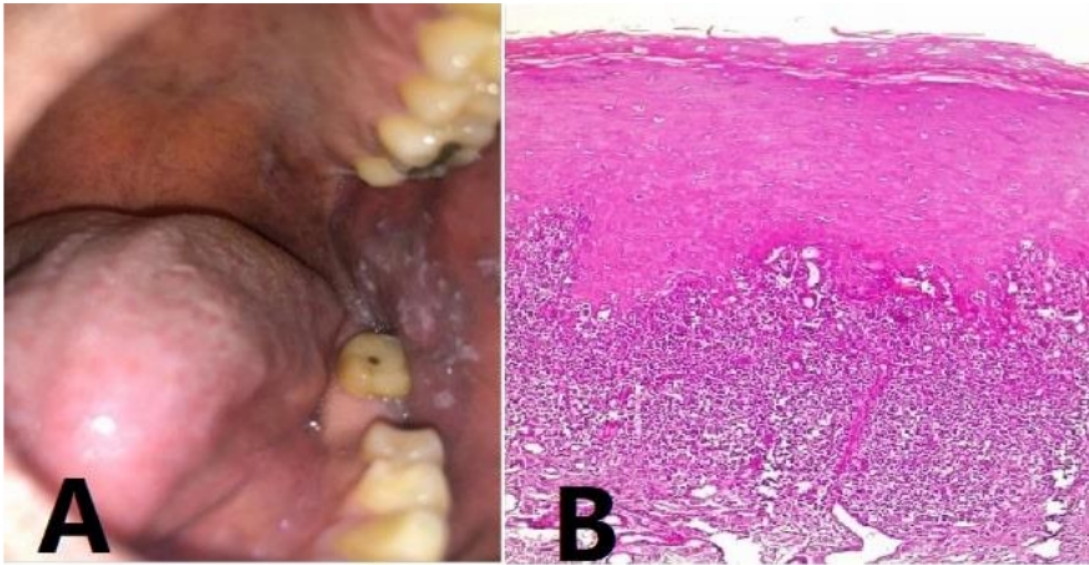
The duration of these lesions range between one month to more than five years, the mean of the duration was  $1.5 \pm 1$  year. About 36.4 % of patients mentioned the duration of less than six months and another 8 patients mentioned duration between six months and one year. In addition to the white lesion in the oral cavity around 8 (29.6%) patients mention the presence of burning sensation or pain, while five patients have an ulcer in the oral cavity (FIGURE 1), on the other hand most of them had no other symptom (40.7%). Regarding the site of these white lesions, most of lesions located in the right buccal mucosa (33.3%) (FIGURE 2) and the left buccal mucosa (30.6%), the next most common location was the gingival (11.1%). About 11 (39.3%) patients had a uniformly white lesion followed by 10 (35.7%) patients had white lesion with red spots, only two patients had erosions. (Table 2)

Table 2: The variables of the white lesion in the study

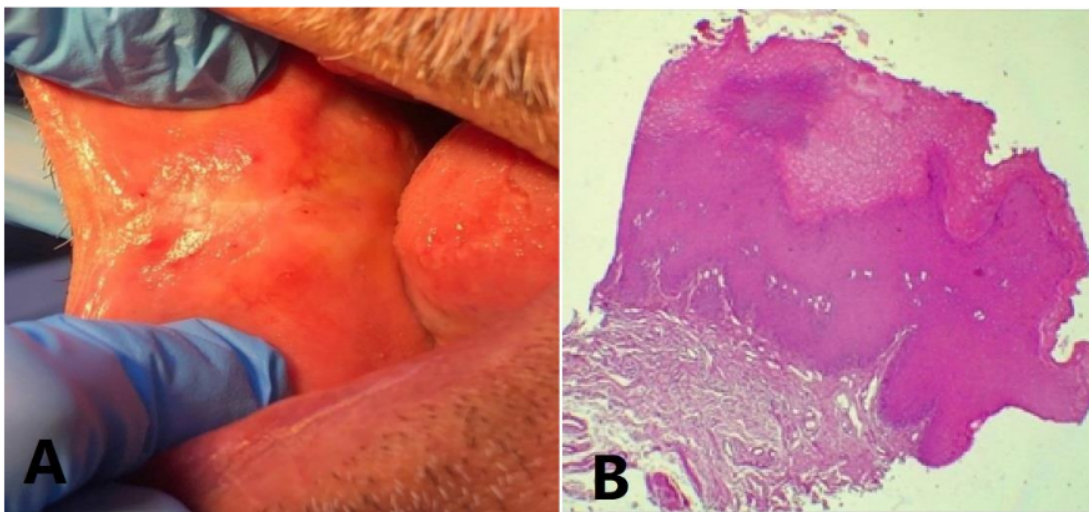
	No.	%

<b>Duration</b>	<6 months	8	<b>36.4</b>
	6months – 1year	8	<b>36.4</b>
	>1year	6	<b>27.3</b>
<b>Symptoms</b>	Pain/burning sensation	8	<b>29.6</b>
	Ulcer	5	<b>18.5</b>
	Lymphadenopathy	3	<b>11.1</b>
	No symptoms	11	<b>40.7</b>
<b>Site</b>	Labial mucosa	2	<b>5.6</b>
	Gingival	4	<b>11.1</b>
	Right buccal mucosa	12	<b>33.3</b>
	Left buccal mucosa	11	<b>30.6</b>
	Dorsum of tongue	3	<b>8.3</b>
	Ventral surface of tongue	1	<b>2.8</b>
	Lateral part of tongue	1	<b>2.8</b>
	Floor of mouth	2	<b>5.6</b>
<b>Characteristics of lesion</b>	Uniformly white	11	<b>39.3</b>
	White with red spots	10	<b>35.7</b>
	Erosions	2	<b>7.1</b>
	Ulcers	5	<b>17.9</b>





**Figure 1: (A) Clinical appearance of lichen planus (B) Histopathologic features of lichen planus**



**Figure 2: (A) Clinical appearance of leukoplakia (B) Histopathologic features of leukoplakia**

Clinically the diagnosis of the white lesions were Lichen planus in 15(68.2%) patients, followed by Leukoplakea in 4 (18.2%) patients, only one case was suspected to be squamous cell carcinoma (4.5%) (Table 3).

Table 3: The clinical diagnosis of the white lesion

Clinical diagnosis	No.	%
--------------------	-----	---

Lichun planus	15	68.2
Hyperkeratosis	2	9.1
Leukoplakea	4	18.2
Squamous cell carcinoma	1	4.5

As all the 22 cases were subjected to a biopsies, 20 (90.9%) of them undergo incisional biopsy and only two had an excisional biopsy. (Table 4)

Table 4: The type of biopsy

Type of biopsy	No.	%
Incisional	20	<b>90.9</b>
Excisional	2	<b>9.1</b>

Histopathologically, most of cases were diagnosed as Lichen planus (72.7%) , And 4 cases diagnosed as Leukoplakea. No case diagnosed as a cancer. ( Table 5)

Table 5: The histopathological diagnosis of white lesion

Histopathological diagnosis	No.	%
Lichen planus	16	72.7
Hyperkeratosis	2	9.1
Leukoplakea	4	18.2

Table 6 presents the link between the clinical diagnostic and pathological diagnosis. Among the 15 patients diagnosed with Lichen planus clinically, only 13 were confirmed by histological investigation. One instance showed hyperkeratosis and the other exhibited Leukoplakia. The clinical diagnosis initially suggested squamous cell carcinoma, however the histological examination revealed hyperkeratosis. The agreement metric, represented by a kappa value of 0.332, indicates a correlation of only 33% between the clinical and histological diagnoses

Table 6: The clinicopathological correlation

	Histopathological	Total



Clinical	Lichun planus	Hyperkeratosis	Leukoplakea	
Lichun planus	13	1	1	15
Hyperkeratosis	1	0	1	2
Leukoplakea	2	0	2	4
17 Squamous cell carcinoma	0	1	0	1
Total	16	2	4	22
P-value = 0.032		kappa value =0.313		

### Discussion

The present study involved 22 oral white lesion biopsy record attending the Dental Clinics at College of Dentistry, University of Basra that were diagnosed clinically and histopathological as white lesion. In this study there is equal ratio in both male and female, 11 cases (50%) were males while 11 cases (50%) were females, this is incompatible with a study of Guang et al. [15], that study Possible causes include a small sample size, a lack of dental facilities, and the rarity of private and general dentistry offices in the locations we studied (40 male cases and 21 female cases, or 66% and 34%, respectively). This could potentially be linked to the overall diminished dental consciousness within our population, as well as the influence of faith-based healing and a widespread apprehension or unease towards any form of surgical procedures".

In this study age distribution ranged from (27 to 80) years. Most lesions observed between 40 and 59 years old (50%), followed by those above 60 years (36.4%) as presented in Table1, that is compatible with study of Gurung et al. [15] who reported that the age distribution ranged from (29 to 86) years.

In this study as presented in Table 5, most of lesions located in right and left of the buccal mucosa 12 (33.3%), 11(30.6 %) respectively and the next most common location was the gingiva (11.1%), there is compatible between this study and other studies [15-17] that reported in study of Neville et al. [16] The buccal mucosa was the most often observed site, as reported by Silverman et al. [17]. They discovered that 46% of patients had lesions in the buccal mucosa, followed by the gingiva in 40% of cases. Also, in a study conducted by Gurung et al. [15], it was found that the buccal mucosa was the

most often affected area for lesions. The distribution of personal habits in this study is presented in Table 2. Out of the total cases, only 4 individuals (18.2%) reported having the personal habit of smoking, while the majority (81.8%) were nonsmokers. This finding contradicts the results of a study conducted by Silverman et al. The study conducted by [17] revealed that 73% of the overall study group were tobacco users, however only 47% of those who developed cancer were smokers. The duration of the lesions in this study varied from one month to over five years, with an average duration of  $1.5 \pm 1$  year. This contradicts the findings of Soyele et al., who found that the average duration of lesions is  $2.5 \pm 3.6$  years, ranging from 2 days to 25 years [18].

The study found that lichen planus lesions accounted for 72.7% of all biopsied lesions, with leukoplakia lesions making up 18.2% and hyperkeratosis 9.1%. This finding agrees with Simi et al study [19], which also found that lichen planus lesions accounted for 72.7% of all biopsied lesions.

A total of fifteen lesions, or 68.2% of the total, were clinically identified as oral lichen planus (OLP). Of those, thirteen were confirmed histopathological as OLP, one as hyperkeratosis, and the other as leukoplakia, demonstrating a correlation between the two methods of diagnosis.

The second most prevalent lesion was leukoplakia, which was identified in 4 cases. Out of those cases, 2 were confirmed to be leukoplakia by histopathology, whereas 2 were diagnosed as lichen planus. A third lesion was hyperkeratosis; two cases were clinically diagnosed; one case was confirmed to be leukoplakia on histological investigation, and the other case was confirmed to be Lichen planus on histopathological testing. Histopathological examination confirmed the clinical suspicion of SCC as hyperkeratosis in one patient.

Based on the kappa rating scale, the clinico-pathological agreement was 0.313, which is considered fair. Histopathological diagnosis correlates as little as 33% with clinical diagnosis. When compared to research in established scientific literature, such as those by Patel et al. [20] and Williams et al. [21], our concordance index of 33 was low.

Improving the concordance rates among various disciplines, particularly between pathologists and surgeons, can be achieved through fostering proficiency and solid interdisciplinary relationships. A decent and suitable biopsy specimen, along with the right methods of transporting the specimen to the laboratory, would also be beneficial to the improvement of concordance. Accuracy in the interpretation of plain radiographs and imaging techniques would also be beneficial [22]. In order to improve the early detection and diagnosis of diseases and biopsied lesions, discordances should be rigorously evaluated by all disciplines, with oral pathology being the primary focus of this examination [23].

## Conclusions

In this study most white lesions have no symptoms, some have burning sensation/pain. White lesion most commonly appeared in buccal mucosa. The characteristic of most white lesion were uniformly white and /or white with red spots. The majority of these lesions clinically and histopathologically were Lichen planus. The measurement of agreement, known as the Kappa value, is equal to 0.332, which indicates that the correlation between clinical and histological diagnosis is as low as 33 percent. That's why the biopsy for histopathological examination is mandatory for definitive diagnosis.

## Acknowledgement

All authors thanks to Sura Amer Ali, Nooralhuda Habib Flayyih, Nooralhuda Habib Flayyih, Maryam Walid Khalid, and Aalaa Riyad Gatia for their helping.

## Disclosure

None

## REFERENCES

1. Bui T, Young JW, Frausto RF, Markello TC, Glasgow BJ, Aldave AJ. Hereditary benign intraepithelial dyskeratosis: report of a case and reexamination of the evidence for locus heterogeneity. *Ophthalmic genetics*. 2016 Jan 2;37(1):76-80.
2. Obradović RR, Kesić GL, Pejčić SA, Marija DB, Petrović SM, Stanković VI, Jovanović GM, Popović ZZ. MANAGEMENT OF RECURRENT APHTHOUS STOMATITIS IN HIV. *Acta Stomatologica Naissi*. 2021;37(83): 2203 – 2212.
3. Marijaa BV, Ana SP, Milena MK, Ivan ZM, Radmila RO, Ivana VS. LICHEN PLANUS: ORALNE MANIFESTACIJE, DIFERENCIJALNA DIJAGNOZA I TERAPIJA LICHEN PLANUS: ORAL MANIFESTATIONS, DIFFERENTIAL DIAGNOSIS AND TREATMENT. *Acta Stomatologica Naissi*. 2020;36(81):1980 – 1994.
4. Stanković JP, Milena K, Marko I, Vukica D. Biofilm formation on dental materials. *Acta Stomatologica Naissi*. 2018; 34(77):1821 – 1831.
5. Šurdilović D, Manjunath SR. Complete rehabilitation of mouth cavity after early childhood caries treatment: A Case Report. *Acta Stomatologica Naissi*. 2017;33(76):1780 – 1785.
6. Mortazavi H, Safi Y, Baharvand M, Jafari S, Anbari F, Rahmani S. Oral white lesions: an updated clinical diagnostic decision tree. *Dentistry journal*. 2019 Mar;7(1):15.

7. Babu RA, Chandrashekar P, Kumar KK, Reddy GS, Chandra KL, Rao V, Reddy BV. A study on oral mucosal lesions in 3500 patients with dermatological diseases in South India. *Annals of Medical and Health Sciences Research*. 2014;4(8):84-93.
8. Gambino A, Carbone M, Arduino PG, Carozzo M, Conrotto D, Tanteri C, Carbone L, Elia A, Maragon Z, Broccoletti R. Clinical features and histological description of tongue lesions in a large Northern Italian population. *Medicina Oral, Patología Oral y Cirugía Bucal*. 2015 Sep;20(5):e560.
9. Rather MI. Clinicohistopathological Correlation of Oral Lesions. *Journal of Contemporary Medical Research*. 2017;4(6):1398-401.
10. Tong DC, Ferguson MM. A clinical approach to white patches in the mouth. *NEW ZEALAND FAMILY PHYSICIAN*. 2002;29(5):334-9.
11. Glick M. *Burket's oral medicine*. PMPH USA; 2015.
12. Jones KB, Jordan RC. White lesions in the oral cavity: clinical presentation, diagnosis, and treatment. *J Fam Pract*. 2015 Dec 1;34(4):161-70.
13. Scully C, Felix DH. Oral Medicine—Update for the dental practitioner: Oral white patches. *British dental journal*. 2005 Nov;199(9):565-72.
14. Weinberg MA, Estefan DJ. Assessing oral malignancies. *American family physician*. 2002 Apr 1;65(7):1379.
15. Gurung P, Sherchan JB, Pai K. Histopathological based retrospective study of oral keratotic white lesions in Manipal health systems-hospital. *Scientific world*. 2012 Sep 20;10(10):70-6.
16. Neville BW, Day TA. Oral cancer and precancerous lesions. *CA: a cancer journal for clinicians*. 2002 Jul;52(4):195-215.
17. Silverman S, Jr., Gorsky, M., Lozada-Nur, F. 1984. Oral leukoplakia and malignant transformation. A follow-up study of 257 patients. *Cancer*. 53: 563-568.
18. Soyele OO, Aborisade A, Adesina OM, Olatunji A, Adedigba M, Ladeji AM, Adeola HA. Concordance between clinical and histopathologic diagnosis and an audit of oral histopathology service at a Nigerian tertiary hospital. *Pan Afr Med J*. 2019 Oct 18;34:100.
19. Simi SM, Nandakumar G, Anish TS. White lesions in the oral cavity: a clinicopathological study from a tertiary care dermatology centre in kerala, India. *Indian Journal of Dermatology*. 2013 Jul;58(4):269.

20. 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 Jan 1;69(1):125-33.
21. Williams HK, Hey AA, Browne RM. The use by general dental practitioners of an oral pathology diagnostic service over a 20-year period: the Birmingham Dental Hospital experience. *British dental journal*. 1997 Jun;182(11):424-9.
22. Fattahi S, Vosoughosseini 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.
23. Tatli U, Erdoğan Ö, Uğuz A, Üstün Y, Sertdemir Y, Damlar İ. Diagnostic concordance characteristics of oral cavity lesions. *The Scientific World Journal*. 2013 Jan 1;2013.