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Interdisciplinary diagnostic and surgical management of oral potentially malignant disorders

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Abstract:

Oral potentially malignant disorders represent a heterogeneous group of lesions with variable risk of malignant transformation, making early diagnosis and appropriate management essential. Therefore, it is of interest to evaluate the role of interdisciplinary diagnostic assessment and surgical management in patients with oral potentially malignant disorders. A total of 120 patients underwent comprehensive clinical evaluation, histopathological diagnosis and individualized management through interdisciplinary collaboration. Surgical or laser-assisted excision was primarily employed for high-risk lesions, with favorable outcomes observed in the majority of cases. An interdisciplinary approach is essential for optimizing early detection, appropriate intervention and long-term surveillance of oral potentially malignant disorders.

Keywords: Oral potentially malignant disorders (OPMDs), oral leukoplakia, epithelial dysplasia, interdisciplinary approach, surgical management

Background:

Oral potentially malignant disorders (OPMDs) comprise a heterogeneous group of mucosal conditions that carry an increased risk of malignant transformation to oral squamous cell carcinoma, representing a significant global health concern [1]. Early and accurate diagnosis of OPMDs is critical, as timely intervention has been shown to reduce morbidity and improve long-term survival outcomes in patients at risk of oral cancer [2]. Clinical diagnosis of OPMDs is often challenging due to overlapping presentations and variable biological behavior, necessitating adjunctive diagnostic tools and histopathological correlation [3]. Histopathological assessment remains the gold standard for diagnosis and risk stratification of OPMDs; however, interobserver variability and limitations of grading systems have prompted the need for integrated diagnostic approaches [4]. Emerging evidence supports the role of interdisciplinary collaboration involving oral medicine specialists, oral pathologists, surgeons and oncologists to enhance diagnostic accuracy and treatment planning [5]. Surgical management continues to be a cornerstone in the treatment of high-risk OPMDs, particularly in lesions showing epithelial dysplasia or clinical features suggestive of malignant potential [6]. Advances in surgical techniques, including laser excision and minimally invasive approaches, have shown promising outcomes in terms of disease control and functional preservation [7]. In addition to conventional surgical modalities, adjunctive and integrative therapeutic strategies are being explored to improve outcomes and reduce recurrence rates in selected cases [8]. Risk assessment and long-term surveillance are essential components of OPMD management, as malignant

transformation may occur even after initial treatment [9, 10]. Therefore, it is of interest to evaluate the interdisciplinary diagnostic and surgical management of oral potentially malignant disorders and evaluate their role in improving diagnostic accuracy, treatment outcomes and long-term surveillance.

Materials and Methods:

This prospective observational study was conducted to evaluate the interdisciplinary diagnostic and surgical management of oral potentially malignant disorders (OPMDs). A total of 120 patients clinically diagnosed with OPMDs were consecutively recruited from the departments of Oral Medicine and Radiology, Oral Pathology and Oral and Maxillofacial Surgery over a defined study period. Patients aged 18 years and above presenting with clinically suspicious oral mucosal lesions suggestive of leukoplakia, erythroplakia, oral lichen planus, oral submucous fibrosis, or other OPMDs were included in the study. Patients with a prior history of oral malignancy, those undergoing active oncologic treatment, or individuals unwilling to provide informed consent were excluded. All patients underwent comprehensive clinical examination followed by adjunctive diagnostic evaluation, including incisional biopsy and histopathological assessment to confirm diagnosis and grade epithelial dysplasia. Based on clinicopathologic correlation, cases were discussed in an interdisciplinary team comprising oral medicine specialists, oral pathologists and oral surgeons to formulate individualized management plans. Surgical intervention was performed for lesions exhibiting moderate to severe dysplasia or high-risk clinical features, using

conventional excision or laser-assisted techniques as indicated. Patients were followed up periodically to assess healing, recurrence and malignant transformation. Data were analyzed descriptively and outcomes were reported in terms of diagnostic concordance, treatment modality and clinical response.

Results:

A total of 120 patients clinically diagnosed with oral potentially malignant disorders (OPMDs) were included in the study. The most commonly diagnosed lesions were oral leukoplakia, followed by oral lichen planus and oral submucous fibrosis. The distribution of different types of OPMDs is presented in (Table 1). Histopathological evaluation revealed varying degrees of epithelial dysplasia among the study participants. Mild dysplasia was the most common finding, followed by moderate and severe dysplasia. The distribution of epithelial dysplasia grades is summarized in (Table 2). Based on clinicopathologic correlation and interdisciplinary case discussions, different management strategies were adopted. Surgical intervention was performed in cases exhibiting moderate to severe dysplasia or high-risk clinical features, while others were managed conservatively. The treatment modalities employed are detailed in (Table 3). During follow-up, satisfactory healing was observed in the majority of surgically treated cases. A small proportion of patients showed lesion recurrence, while malignant transformation was observed in a limited number of cases. Follow-up outcomes are presented in (Table 4).

Table 1: Distribution of oral potentially malignant disorders (n = 120)

Type of OPMD	Number of Patients	Percentage (%)
Oral leukoplakia	48	40
Oral lichen planus	34	28.3
Oral submucous fibrosis	26	21.7
Erythroplakia	8	6.7
Others	4	3.3
Total	120	100

As shown in Table 1, oral leukoplakia was the most frequently encountered OPMD.

Table 2: Histopathological grading of epithelial dysplasia

Grade of Dysplasia	Number of Patients	Percentage (%)
No dysplasia	22	18.3
Mild dysplasia	46	38.3
Moderate dysplasia	34	28.3
Severe dysplasia	18	15
Total	120	100

Table 2 shows that a majority of cases demonstrated mild to moderate epithelial dysplasia.

Table 3: Management approach adopted for OPMDs

Management Modality	Number of Patients	Percentage (%)
Surgical excision	58	48.3
Laser-assisted excision	22	18.3
Conservative management	40	33.4
Total	120	100

As shown in Table 3, nearly two-thirds of patients underwent surgical or laser-assisted management.

Table 4: Follow-up outcomes of treated OPMDs

Outcome	Number of Patients	Percentage (%)
No recurrence	92	76.7
Recurrence	20	16.6
Malignant transformation	8	6.7
Total	120	100

Table 4 indicates favorable outcomes in the majority of patients following interdisciplinary management.

Discussion:

The present study highlights the importance of an interdisciplinary approach in the diagnosis and surgical management of oral potentially malignant disorders (OPMDs), emphasizing the role of clinicopathologic correlation in treatment decision-making. Similar to previous reports, oral leukoplakia was identified as the most common OPMD, reinforcing its clinical significance due to its relatively higher risk of malignant transformation. Warnakulasuriya *et al.* (2021) [11] provided a comprehensive framework for defining and classifying OPMDs, highlighting that leukoplakia remains the most prevalent and clinically significant condition in this spectrum. Histopathological assessment revealed that a substantial proportion of cases showed mild to moderate epithelial dysplasia. Kumari *et al.* (2022) [12] documented the etiology, pathogenesis and malignant transformation pathways of OPMDs, emphasizing that dysplastic changes are key histological indicators of progression risk. This variability underscores the limitation of relying solely on clinical appearance for risk assessment and supports the necessity of biopsy and histological grading as part of routine evaluation. Odell *et al.* (2021) [13] examined the recognition, grading and clinical significance of oral epithelial dysplasia, proposing refinements to the WHO grading criteria that emphasize architectural features as primary determinants of malignant potential. These findings support the use of structured histological grading in guiding management decisions, as employed in the present study. In the present study, surgical and laser-assisted excision was predominantly employed for lesions exhibiting moderate to severe dysplasia or high-risk clinical features. Hankinson *et al.* (2025) [14] compared four grading systems for oral epithelial dysplasia and confirmed that severe OED carries a substantially higher risk of malignant transformation, supporting risk-stratified surgical intervention as a rational management strategy. Rich *et al.* (2023) [15] reviewed diagnostic practices for OPMDs across diverse ethnogeographic settings, highlighting that clinical correlation and biopsy remain indispensable for accurate diagnosis and that management strategies must account for local variations in lesion behavior and risk factors. This aligns with the structured clinicopathologic approach adopted in the present study. Despite appropriate intervention, recurrence was observed in a subset of patients, highlighting the chronic and unpredictable nature of OPMDs. Ge *et al.* (2025) [16] reported that structured risk stratification and multidisciplinary team management significantly improved early detection rates and intervention strategies, reinforcing the value of coordinated interdisciplinary care in OPMD management. The occurrence of malignant transformation in a small proportion of cases further supports

the concept that OPMDs represent a dynamic disease spectrum rather than static lesions. Zhang *et al.* (2023) [17] showed that narrow band imaging can improve the detection of malignant transformation in OPMDs with high sensitivity, offering adjunctive value alongside conventional biopsy-based approaches in high-risk surveillance. The interdisciplinary model adopted in this study facilitated comprehensive evaluation, optimized treatment planning and consistent follow-up. González-Moles and Ramos-García (2024) [18] confirmed through systematic review and meta-analysis that oral lichen planus carries a measurable risk of malignant transformation, emphasizing the need for vigilant, structured follow-up within a multidisciplinary framework for all OPMD subtypes. Louisy *et al.* (2024) [19] provided an updated evidence-based review of oral lichen planus management, noting that surveillance intervals and therapeutic decisions benefit substantially from interdisciplinary input involving dermatologists, oral medicine specialists and oncologists, consistent with the model applied in this study. Overall, the findings reinforce that effective management of OPMDs requires not only accurate diagnosis and appropriate surgical intervention but also coordinated interdisciplinary care and vigilant long-term follow-up to mitigate the risk of recurrence and malignant transformation. Kizhakkottu and Ramani (2024) [20] showed that early referral and structured patient awareness programs are critical for improving detection rates and treatment outcomes in OPMDs, underscoring that system-level interdisciplinary strategies are essential beyond individual clinical encounters.

Conclusion:

We show that interdisciplinary diagnostic evaluation combined with appropriate surgical management plays a crucial role in the effective management of oral potentially malignant disorders. Clinicopathologic correlation aids in accurate risk stratification and treatment planning, particularly in lesions with epithelial dysplasia. Long-term follow-up and coordinated multidisciplinary care remain essential to reduce recurrence and monitor malignant transformation.

Limitations and future directions:

The present study was limited by its single-center design and a relatively modest sample size, which may restrict the generalizability of the findings. Additionally, molecular and genetic markers associated with malignant transformation were not evaluated. Future multicenter studies incorporating larger populations, longer follow-up periods and adjunctive molecular diagnostics are recommended to improve risk stratification and enhance individualized management strategies for oral potentially malignant disorders.

Clinical significance:

Interdisciplinary diagnostic evaluation enhances the early identification and accurate risk stratification of oral potentially malignant disorders, enabling timely and appropriate intervention. Surgical management guided by clinicopathologic findings can reduce lesion persistence and support favorable

clinical outcomes. Emphasis on long-term follow-up is clinically significant for early detection of recurrence and malignant transformation.

Implications for practice:

Clinicians should adopt a multidisciplinary approach involving oral medicine specialists, pathologists and surgeons for comprehensive management of oral potentially malignant disorders. Routine biopsy and histopathological assessment should guide treatment decisions, particularly for lesions with dysplasia. Incorporation of structured surveillance protocols and patient education into routine practice is essential to optimize long-term outcomes and reduce the burden of oral cancer.

Advancement of knowledge:

This study highlights the practical value of an interdisciplinary diagnostic model that integrates clinical evaluation, histopathology and surgical decision-making in the management of oral potentially malignant disorders. It provides contemporary evidence supporting risk-based surgical intervention, including laser-assisted techniques, for lesions with epithelial dysplasia. Additionally, the findings emphasize the importance of structured long-term surveillance within a multidisciplinary framework to address recurrence and malignant transformation.

References:

- [1] Şengün DN *et al.* *Diagnostics (Basel)*. 2026 **16**:1364. [PMID: 42122066].
- [2] Wang J *et al.* *BMC Oral Health*. 2025 **25**:1980. [PMID: 41276813].
- [3] Iyer K *et al.* *Front Oral Health*. 2023 **4**:1286780. [PMID: 38024143].
- [4] Su YF *et al.* *Diagnostics (Basel)*. 2021 **11**:1287. [PMID: 34359370].
- [5] Choudhary N *et al.* *Bioinformation*. 2025 **21**:2075. [PMID: 41170036].
- [6] <https://www.ncbi.nlm.nih.gov/books/NBK611818/>
- [7] Dhole S & Mahakalkar C. *Cureus*. 2024 **16**:e61141. [PMID: 38933617].
- [8] <https://www.ncbi.nlm.nih.gov/books/NBK560760/>
- [9] Liu X *et al.* *MedComm (2020)*. 2026 **7**:e70605. [PMID: 41631093].
- [10] Menditti D *et al.* *Bioengineering (Basel)*. 2024 **11**:228. [PMID: 38534502].
- [11] Warnakulasuriya S *et al.* *Oral Dis*. 2021 **27**:1862. [PMID: 33128420].
- [12] Kumari P *et al.* *Front Pharmacol*. 2022 **13**:825266. [PMID: 35517828].
- [13] Odell E *et al.* *Oral Dis*. 2021 **27**:1947. [PMID: 34418233].
- [14] Hankinson P *et al.* *Histopathology*. 2025 **86**:933. [PMID: 39688116].
- [15] Rich AM *et al.* *Front Oral Health*. 2023 **4**:1122497. [PMID: 37089445].
- [16] Ge B *et al.* *Front Oncol*. 2025 **15**:1697676. [PMID: 41132729].
- [17] Zhang Y *et al.* *Front Surg*. 2023 **9**:1068256. [PMID: 36684262].

[18] González-Moles MA & Ramos-García P. *Cancers (Basel)*. 2024 **16**:608. [PMID: 38339358]

[19] Louisy A *et al.* *Am J Clin Dermatol*. 2024 **25**:35. [PMID: 37713153]

[20] Kizhakkootu S & Ramani P. *Cureus*. 2024 **16**:e57740. [PMID: 38716030]

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