

Clinico-Pathological Correlation: A Tool for Diagnosis of Oral Lesions

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ABSTRACT

Introduction: Oral lesions are common occurrences in day-to-day clinical scenarios. The accurate diagnosis and appropriate therapeutic intervention are crucial aspects of delivering effective oral health care. It is well-established that the appearance of a lesion itself serves as key diagnostic data, particularly in cases of clinical dermatology. The primary objective of this study is to assess the concordance between clinical evaluations and histopathological diagnoses of pathologies in the oral cavity.

Materials and Methods: The questionnaire comprised 10 questions based on clinical photographs, ensuring patient anonymity by avoiding the sharing of identifiable information. The questions aimed to elicit a comprehensive diagnosis for various categories such as odontogenic lesions, salivary gland origins, infectious lesions, and precancerous lesions. Additionally, questions regarding appropriate investigations for each type of lesion were included. The questionnaire was distributed to a diverse group of participants, including undergraduate students (third and final year), interns, postgraduate students, and faculty members from various departments.

Results: The present cross-sectional study involved 160 participants, consisting of 71 (44%) undergraduates (UGs), 32 (20%) postgraduates (PGs), 30 (19%) interns, and 27 (17%) faculty members. A total of 10 clinical cases were evaluated.

Conclusion: Clinicians should remain focused on the varied causative features and potential diagnostic possibilities, which may necessitate the collection of additional detailed information and a thorough clinical assessment of the patient. In instances where the clinical diagnosis does not align with the etiological factors or the results of laboratory or radiological investigations, the pathology (biopsy report) serves as the ultimate diagnostic tool.

Keywords: clinicopathological correlation, diagnosis, investigations, classification, oral carcinoma, cancer

INTRODUCTION

Oral lesions are the most common entities in day-to-clinical scenarios.¹ Accurate diagnosis and correct therapeutic intervention is key feature of delivering oral health care. It's a well-known fact that the appearance of lesion in itself provides a key diagnostic data as in cases of clinical dermatology.¹

Dental surgeons are well trained for assessing, monitoring and treating oral lesions in the best possible manner.¹ For evidence-based recommendations of biopsy assessment and clinical care, an improved comprehension of correct clinical lesion is of valued significance.²

Thus, to reduce the risk of misdiagnosis and upgrade the precision of clinical diagnosis, it is necessary for clinicians to perpetuate a high grade of clinical skill and to stay up-to-date with the recent advances and best clinical practices.² Collaboration between healthcare professionals, including physicians, nurses, and laboratory technicians, can also improve the accuracy of clinical diagnosis by providing a more comprehensive and multidisciplinary approach.³

Clinical diagnosis is a complex and dynamic process that demands a thorough understanding of both medical science and patient-centered care. The patient-centered approach can

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significantly enhance the accuracy and efficacy of clinical diagnoses, resulting in improved patient outcomes.

Disparity in clinic-pathologic association of oral pathologies depends upon varied factors such as appropriate biopsy site, total patients sample and type of patients vary amongst different study groups. The disparity might also be the result of subjective variation between clinician and a pathologist.

This necessitates the need for strict synergism amongst clinician and histopathologist for accurate diagnosis. Henceforth, the present study was conducted to illustrate the concordance amongst clinical evaluation and histopathological diagnosis of pathologies in oral cavity.

MATERIAL AND METHODS

The present study employs a cross-sectional study design, employing a questionnaire crafted through Google Forms. The questionnaire consisted of 10 questions based on clinical photographs, and we ensured patient anonymity by not sharing identifiable information. The questions aimed to obtain a broad diagnosis for categories such as odontogenic lesions, salivary gland origins, infectious lesions, and precancerous lesions. Additionally, we included questions on appropriate investigations for each lesion.

We circulated the questionnaire to a group of participants consisting of undergraduate students (third and final year), interns, postgraduate students, and faculties from various departments. We organized the results in an Excel spreadsheet

and conducted statistical analysis using the chi-square test with SPSS v23.

RESULTS

The present cross sectional study comprised of 160 participants which included 71 (44%) undergraduates (UG's), 32 (20%) postgraduates (PG's), 30 (19%) interns and 27 (17%) faculties. 10 clinical cases were evaluated.

In case 1, final diagnosis was given as moderate epithelial dysplasia and 120 (75%) participants thought of it to be a pre-malignant lesion including 69 % UG's, 87% PG's, 76% Interns, 74% faculties). Thereby suggesting that clinical diagnosis was in accordance with histopathological diagnosis in majority of participants (Figure 1 C).

In case 2, type of investigation was asked to be done in the particular case. Majority of the participants knew about how to proceed with which type of investigation for pemphigus vulgaris (Figure 1F).

In case 3 (Figure 2C), participants were asked to identify the type of the lesion. Final diagnosis of this case was Round cell

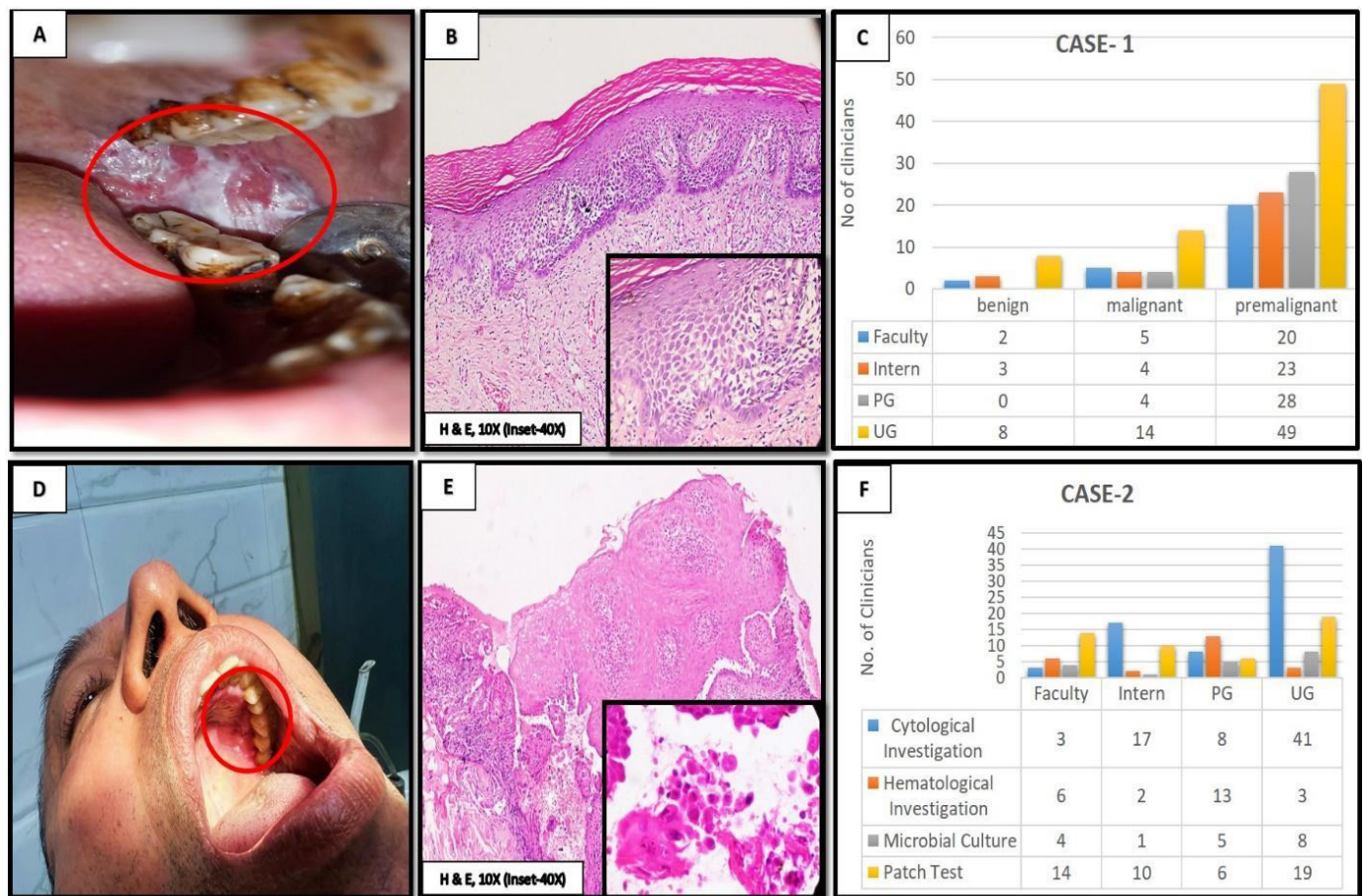


Fig. 1: A) Clinical photomicrograph depicting grayish white wrinkled lesion with involvement of erythematous components seen on the left buccal mucosa extending from 37 region to retromolar region. B) Histological examination suggestive of moderate epithelial dysplasia showing dysplastic features such as cellular and nuclear pleomorphism, altered nuclear to cytoplasmic ratios, prominent junctions and increased and prominent nucleoli. C) Graphical representation of the questionnaire result for case 1 D) Clinical photomicrograph showing erythematous lesion on the left posterior palatal region. E) Histological examination revealing suprapithelial split and presence of tzanck cells within the space. F) Graphical representation of the questionnaire result for case 2

tumor. Out of 160 participants, 35 (21%) participants were able to tell that it was an odontogenic lesion (including 18% UG's, 40% PG's, 26% interns, 3.7 % faculties).

In case 4 (Figure 2F), final diagnosis was Adenosquamous carcinoma and participants were asked to identify the type of lesion. 45 (28%) participants including 29 % UG's, 28 % PG's, 38 % interns, 18 % faculties were able to tell that it was an ulcerative lesion.

In case 5 (Figure 3C), clinicopathological correlation suggestive of neurofibroma. 42.5% participants thought of it to be an epulis, 22.5% opted for fibroma, 30 % voted for giant cell lesion, while 4.3% thought of it as a malignancy.

In case 6 (Figure 3F), final diagnosis was low grade mucoepidermoid carcinoma and the origin of the lesion was asked. 21.25% participants (including 19% UG'S, 15.6% PG'S, 33.3% interns, 18.5% faculty) thought of it to be of epithelial origin. So yes in this case clinicopathological diagnosis was in accordance with histopathological diagnosis in 21% participants.

In case 7 (Figure 4C), type of investigation was asked for TUGSE, most of the participants knew the right investigation

required for the given case.

In case 8 (Figure 4F) type of the lesion was shown for which final diagnosis was Moderately differentiated SCC, 95 participants (59.3%) including 63% UG'S, 60% PG'S, 60% interns, 59.2% faculty opted for Habit associated malignancy.

In case 9 (Figure 5C), origin of the lesion was asked and final diagnosis was traumatic ulcer. 20% participants 32 in number including 9.8% UG'S, 25% PG'S, 20% interns, 40.7% faculty) recognized the traumatic origin just by showing the clinical picture.

In case 10 (Figure 5F), Final diagnosis was pyogenic granuloma and type of lesion was asked. 69 (43.1%) participants including 42.2% UG'S, 43.7% PG'S, 36.6% interns, 51.8% faculty opted for habit associated malignancy which clearly indicates the need of histopathological diagnosis in all the cases.

DISCUSSION

The current scenario in clinical setups regarding the downfall in sensitivity of clinical diagnosis of oral pathologies warrants the necessity for sending all the biopsied specimens for

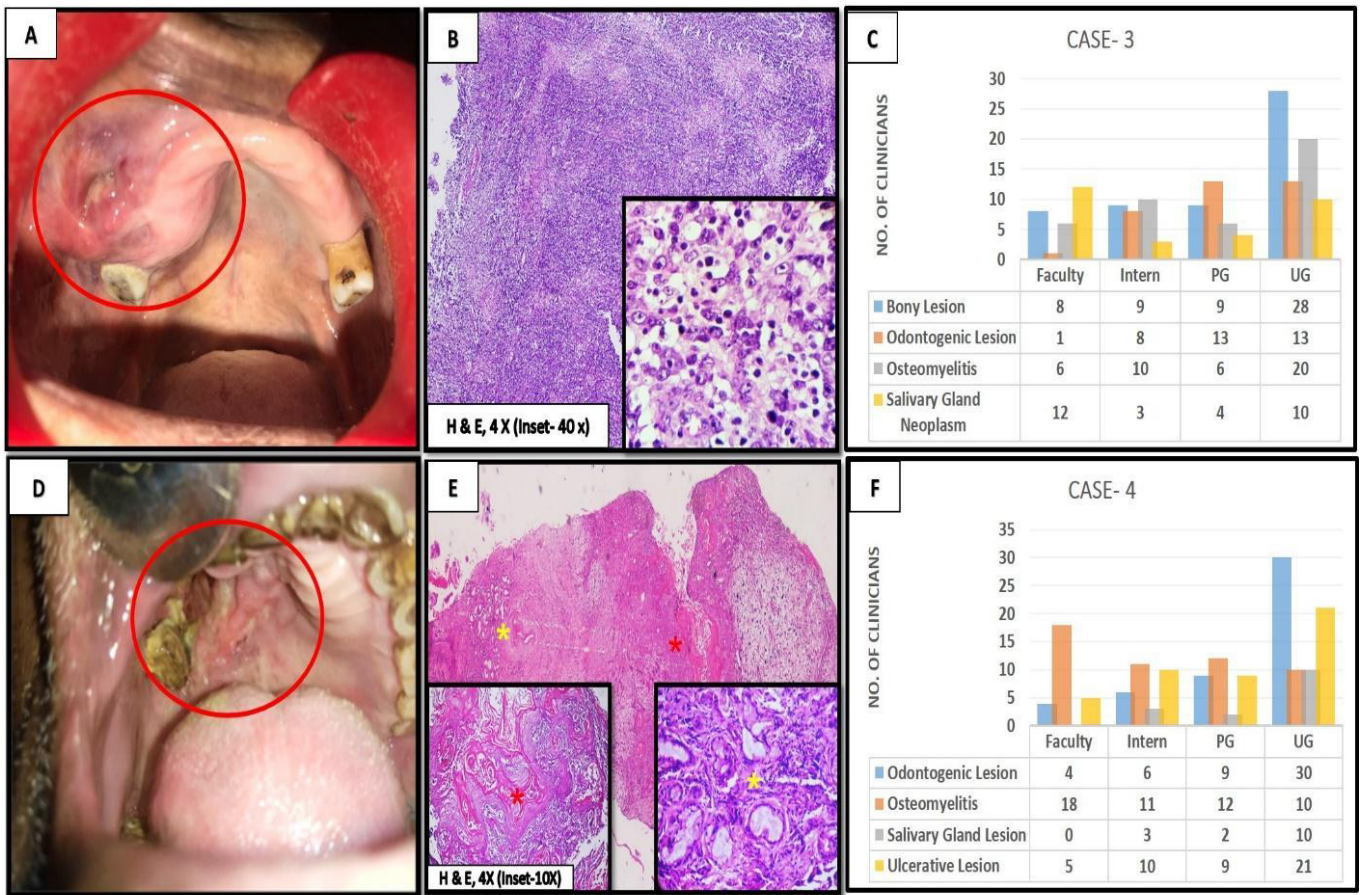


Fig. 2: A) Clinical photomicrograph depicting large round oval swelling involving the maxillary alveolus and palatal region showing focal area of ulceration. B) Histological examination suggestive of round cell tumor depicting round cells with well demarcated cell membrane and scant cytoplasm. Nucleus varies from being vesiculated to hyperchromatic and areas of atypical cells are also evident. C) Graphical representation of the questionnaire result for case 3 D) Clinical photomicrograph showing ulcerated area with focal area of necrotic slough and greyish white surrounding on the palate and alveolus E) Histological examination reveals areas of invasion in the form of tumor islands, sheets and nests of cells along with squamous and glandular differentiation in separate zones of stroma. F) Graphical representation of the questionnaire result for case 4

microscopic assessment and interpretation in order to aid in final diagnosis and provide an appropriate treatment modality to the patients. Also, the dental surgeons should always depend on detailed patients clinical histories and convey the same to the pathologist. Apart from achieving an accuracy in planning thorough treatment modality for patients, it is the necessity for every surgeon to be cautious in taking correct biopsies in order to reduce diagnostic errors.⁴

In case 1, majority of the study groups were in correct in their interpretation (Figure 1A, B, C). Early and correct diagnosis of the Oral potentially malignant disorders (OPMDs) are of extreme significance as it prevents malignant transformation of such cases.

Sometimes the challenge lies in detecting the oral mucosal abnormalities with malignant potential at the earliest stage so as to enhance the prognosis of the case. In order to enhance the detection of these potential oral mucosal changes, there are certain chair-side / minimally invasive diagnostic techniques

which acts as a diagnostic adjunct to final diagnosis.⁵ Such was the case 2 of pemphigus vulgaris (Figure 1D,E,F) in which the investigations were of extreme significance.

Case 3 was a clear case of diligent interplay of clinic-pathological correlation as clinically it was a large swelling with varied differential diagnosis including tumor of salivary gland, odontogenic origin tumor or a bony lesion. Hence, such scenarios warrants the need for thorough histological as well as clinical evaluation of the lesion. If required molecular markers can also aid in final diagnosis. Histological diagnosis was suggestive of round cell tumor (Figure 2 A, B, C).

Case 4 clinically was highly suggestive of some salivary gland malignancy as there was an ulcerated lesion on the palate with areas of necrosis. But on histological evaluation it came out to be adenosquamous carcinoma (Figure 2 D,E,F) which as suggested in literature depicts higher proliferative potential including local invasiveness along with distant metastasis as compared to other histopathological variants of OSCC such

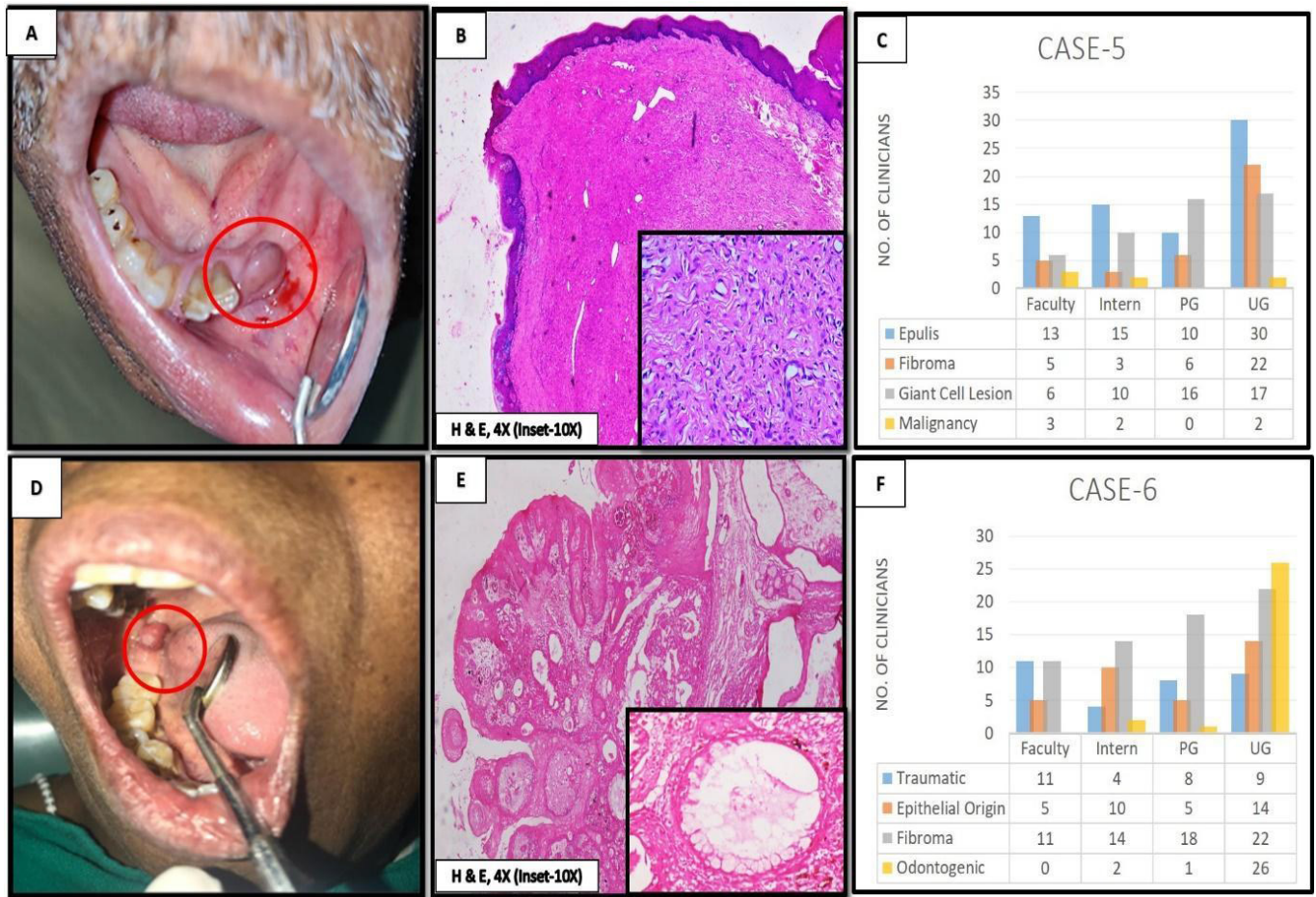


Fig. 3: **A)** Clinical photomicrograph showing an elevated nodule of normal color with a smooth surface in the mandibular anterior tooth region wrt 32 and 33. **B)** Histological examination suggestive of neurofibroma having areas of spindle shaped cells with wavy nuclei and shredded carrot like appearance of the collagen fibers. **C)** Graphical representation of the questionnaire result for case 5 **D)** Clinical photomicrograph showing small round to oval nodular growth on the retraomalar area. **E)** Histological examination was suggestive of low grade MEC showing multiple areas of cystic structures along with presence of mucous, epidermoid and intermediate cells. **F)** Graphical representation of the questionnaire result for case 6

as adenoid squamous cell carcinoma (Liu Y 2021). Therefore, this entire scenario suggests that clinicians should never give a diagnosis merely on the basis intuition or guesswork. The diagnosis should always be on the fundamentals of clinic-pathological correlation.^{6,7}

Diagnosis of small nodular growths in oral cavity can sometimes be quite challenging as few small growths can turn out to be malignancies if examined diligently via histological examination. Such was the case scenarios of both cases 5 and 6 where both of them showed small nodular growths clinically and both were behaving as a benign swelling. Case 5 turned out to be a case of neurofibroma (Figure 3 A, B, C) which was confirmed after thorough histological and histochemical investigations whereas case 6 was a case of low grade mucoepidermoid carcinoma (Figure 3 D,E,F) which is a salivary gland malignancy. These cases are suggestive of the importance of clinicians being aware about the fact that salivary gland tumors are likely to occur in areas of minor salivary glands as seen in case 6 where the nodular growth was on the retromolar area. Likewise, clinicians should also keep other mesenchymal origin tumors as differentials for the growth on gingiva apart from fibroma as seen in case 5.

If we look at case 7, 8 and case 9, all the cases were clinically suggestive of an ulcer (Figure 4) whereas histologically they were entirely varied in characterization as case 7 was Traumatic ulcerative granuloma with stromal eosinophilia (TUGSE), case 8 was Oral Squamous Cell Carcinoma and case 9 was traumatic ulcer (Figure 5 A, B, C). TUGSE most often mimics either malignancy or an infectious condition. Henceforth, biopsy combined with complete clinical monitoring is of utmost importance in such scenarios. Screening tests are recommended for infectious conditions and hence they must be advised routinely. Such lesions tend to resolve spontaneously, precluding any requirement for further actions other than clinical follow up. Clinical follow up is of extreme significance even in cases of complete remission.⁸

Most common location for chronic or persistent ulcerations is oral mucosa and, despite their varied etiology ranging from minor irritation (e.g. trauma) to malignant appearance and systemic diseases, they may often appear clinically indistinguishable from other conditions. While the diagnosis of some types of oral ulcers is facilitated by their association with lesions on the skin and/or mucous membranes in other areas, ulcers which are localized to the oral cavity may be more difficult to

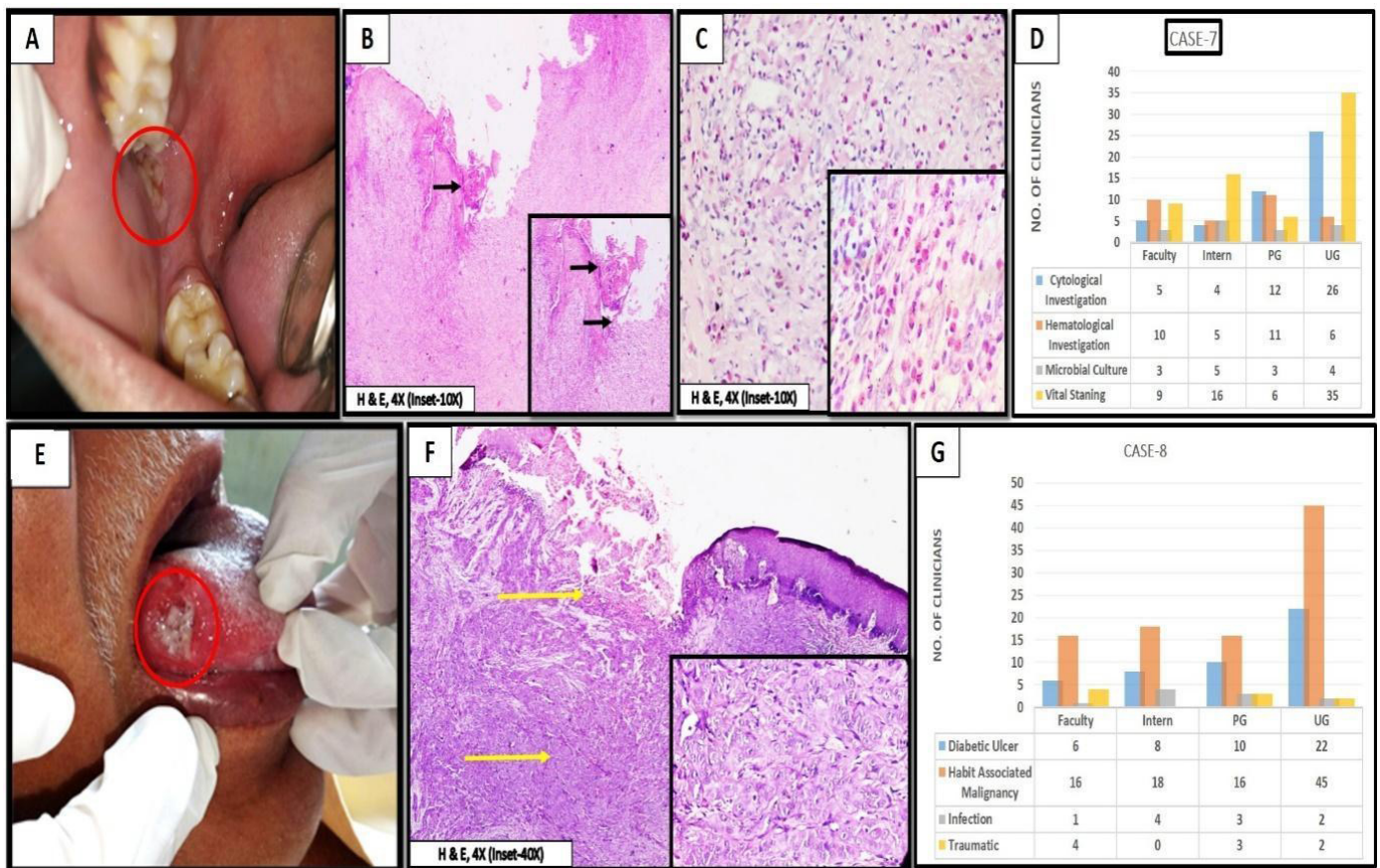


Fig. 4: A) Clinical photomicrograph showing ulcerated lesion on the retromolar area. B) Histological examination demonstrated ulcerated epithelium with presence of numerous amount of eosinophils in the connective tissue stroma. C) Graphical representation of the questionnaire result for case 7 D) Clinical photomicrograph showing an ulceration on the lateral border of tongue E) Histological examination was suggestive Squamous cell carcinoma having areas of invasion and atypical features in the tumor cells. F) Graphical representation of the questionnaire result for case 8



identify.⁹ Although some cases may mimic the malignant situation when even not present, but certain cases may be malignant beforehand and the failure of the clinician to predict the exact situation might end up in worsening of the existing case. Most of the oral ulcers are, therefore, biopsied because they are less readily recognizable on the basis of their clinical features. Skillful case history taking and correct investigations aid in arriving at the etiopathology and early diagnosis of ulcers on which the effective treatment planning is based. An understanding of the pathogenesis may provide clues as to the cause of this enigmatic group of diseases.¹⁰

Case 10 was a case of pyogenic granuloma (Figure 5 D,E,F) and the diagnosis was given after clinic-pathological evaluation only.

Despite of the literature suggesting huge amount of disparity amongst clinical and histopathological features, it is the necessity to guide patients regularly for histopathologic investigations for following reasons:¹¹

1. Varied group of dermatological disorders may present themselves as subtle signs in oral cavity and might be misleading as they report to other specialities for treatment.

2. Few of potentially malignant disorders such as oral lichen planus and leukoplakia tend to malignant transformation and henceforth, early diagnosis with proper histopathological examination is of utmost importance in clinical scenarios.

CONCLUSION

The dental practice is an art, standing on the canvas of science. The initial diagnostic precision should always be dependent on the detailed history and clinical factors. The clinician should always be focussed at the varied causative features and the likely diagnostic possibilities- that might warrants the need for re-collection of detailed information and in-depth clinical assessment of the patient. Scenarios where the clinical diagnosis does not corresponds with the etiological factors or the results of laboratory or radiological investigations, the pathology (biopsy report) provides the final diagnosis.¹²

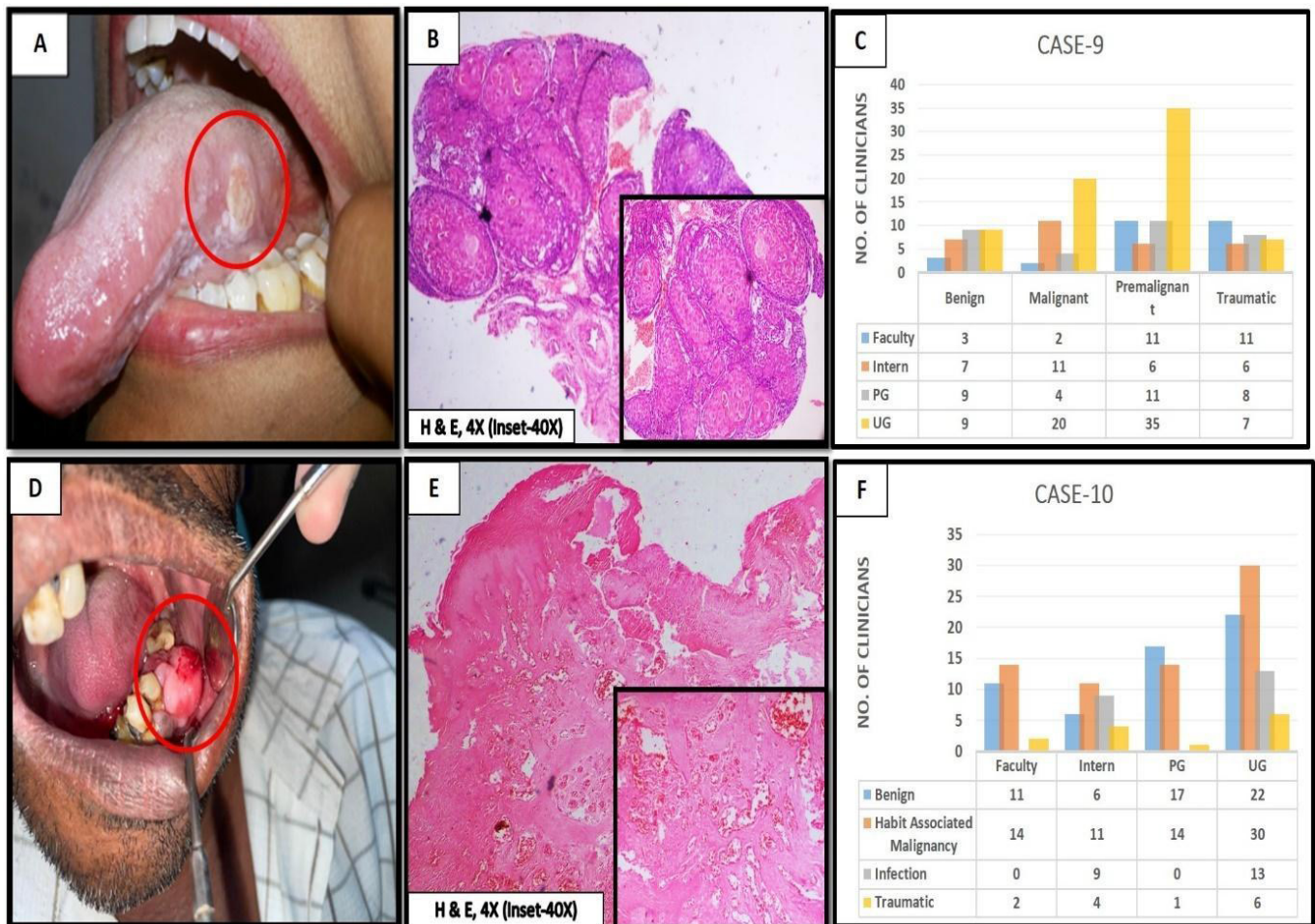


Fig. 5: A) Clinical photomicrograph showing ulcerated lesion on the lateral border of the tongue. B) Histological examination demonstrated hyperplastic ulcerated epithelium with areas of proliferation into the underlying stroma along with presence of inflammatory infiltrate. C) Graphical representation of the questionnaire result for case 9. D) Clinical photomicrograph showing large sessile growth on the gingiva with areas of erythematous component. E) Histological examination was suggestive pyogenic granuloma depicting endothelial cell proliferation and numerous small capillaries in the stroma along with extravasated RBCs. F) Graphical representation of the questionnaire result for case 10.

Thereby it can be postulated that in cases with complicated clinical views, it is difficult to give diagnosis based on clinical data and henceforth, this necessitates the simultaneous consideration of the clinical and microscopic views for correct diagnosis of pathologies.

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