INTRODUCTION:

Dysplasia is a Greek word meaning abnormal atypical proliferation of tissues. Term dysplasia was introduced by Reagon in 1958 in relation to cells exfoliated from the uterine cervix. It is encountered principally in the epithelia. It is a forerunner of cancer. In past, epithelial dysplasia, epithelial atypia and dyskeratosis were used synonymously. Pindborg (1977) defined epithelial dysplasia as the term used for a lesion in which part of thickness of the epithelium is replaced by cells showing varying degree of atypia. Kumar (1992) it is a disturbance in maturational sequence of stratified squamous epithelium and disturbance in cell kinetics of the proliferative compartment with cytological changes. Paul Freedmen & Stanley Kerpel (1995) define it is the diagnostic term used to describe the histopathological changes seen in chronic, progressive and premalignant disorders of oral mucosa. Oral Epithelial Dysplasia (OED) is the diagnostic term used to describe the histopathologic changes seen in a chronic, progressive and premalignant disorder of the oral mucosa. OED is not associated with any specific clinical appearance, however, leukoplakia and erythroplakia are the lesions classically associated with dysplastic changes. It is also consistently seen in the mucosa adjacent to the tumor in patients with invasive squamous cell carcinoma. Dysplastic epithelium is found in 5-25% of biopsy samples of the leukoplakia. It should be emphasized that leukoplakia is a clinical term, and its use carries no implications with regard to the histological findings. It is recommended that a histological report should always include a statement on the presence or absence of epithelial dysplasia and, if present, the assessment of its severity. Erythroplakia, a much rarer lesion than leukoplakia, almost invariably reveals epithelial dysplasia. Shafer and Waldron analyzed 65 cases of erythroplakia. All erythroplakia cases showed some degree of epithelial dysplasia. 51% - invasive SCC, 40%- carcinoma in situ or severe epithelial dysplasia, 9%- mild-to-moderate dysplasia. A true clinical erythroplakia is a much more worrisome lesion than leukoplakia.

GRADING OF EPITHELIAL DYSPLASIA AND ITS APPLICATIONS

The severity of dysplastic features is designated as Grade of epithelial dysplasia. Many dysplastic features in varying combinations have been used for grading. However difficulties have been encountered in assessing and standardizing the different degrees of epithelial dysplasia. Many systems of grading epithelial dysplasia have been proposed in order to standardize the severity of dysplastic features. The diagnosis and grading of oral epithelial dysplasia is based on a combination of architectural and cytological changes. Although it is established that oral potentially malignant lesions and epithelial dysplasia are statistically more likely to progress to cancer, the actual mechanisms are poorly understood and it is not inevitable that a dysplastic lesion will progress to cancer. Therefore it is necessary to detect the oral epithelial dysplasia as early as possible.

DIAGNOSIS OF ORAL EPITHELIAL DYSPLASIA:

Techniques that supplement the clinical diagnosis and improve diagnosis of early oral premalignancy are:

- Conventional oral examination (COE)
- Detection by toluidine blue staining
- Detection by acetic acid
- Chemiluminescent illumination
- Optical Coherence Tomography (OCT)

1. ORAL EXAMINATION using normal light has long been the standard method for screening of oral premalignancy. It remains the gold standard for identification of oral mucosal lesions but one major limitation for conventional oral examination is that only small percentages of leukoplakias are progressive and become malignant and a COE cannot discriminate between these lesions and their non progressive counterparts. Some precancerous lesions may be lurking with in
mucosa that appears clinically normal by conventional oral examination alone. This concept is supported by the work of Thomson who in his study found that 36% of patients had histological evidence of dysplasia in a biopsy from clinically normal mucosa.

2. **TOLUIDINE BLUE** is also called as tolonium chloride. It has been used for more than 40 years to aid in detection of mucosal abnormalities of the cervix (Richart 1963) and the oral cavity. Toluidine blue is a metachromatic vital dye that may bind preferentially to tissues undergoing rapid cell division. This response permits detection of small and early lesions and also permit their surface delineation. Toluidine blue is regarded as a nuclear stain and in vivo test is based on fact that the dysplastic cells contain quantitatively more nucleic acid than normal tissue. The fact that the intercellular canals are wider than in normal epithelium might facilitate the penetration of dye in tumor tissue. Toluidine blue is useful for the detection of areas of carcinoma in situ. The recognition of small, early invasive carcinoma. Delineation of the margins of larger epithelial neoplasm. The recognition of postsurgical marginal recurrence.

3. **ACETIC ACID** can be used in detection of dysplastic areas and Squamous cell carcinoma. Acetic acid is easy to use and in expensive. Acetic acid cause dehydration of cells and coagulation of cellular protein result in reducing the transparency of epithelium.

4. **Chemiluminescent illumination** first coined by Eilhardt Weidemann in 1888. Term Chemiluminescence refers to the emission of light from a chemical reaction. Vizilite is a recently introduced diagnostic tool devised for the early detection of lesions based upon principle of Chemiluminescence. Specific wavelength is absorbed by normal cells and reflected back by abnormal cells due to high nucleus / cytoplasm ratio As a result atypical mucosal abnormalities appear white.

5. **Optical Coherence Tomography (OCT)** In vivo, non-invasive OCT permits high-resolution imaging of tissue surfaces and sub-surfaces, with the potential capability for detection and mapping of epithelial pathologies. With an imaging depth range of 2–3 mm, OCT diagnostics are particularly suitable for the oral mucosa. This technique is rapid, inexpensive well received by the patient and used in screening high risk population.

Malignant potential in oral epithelial dysplasia increases with increasing severity of dysplasia. 50% in severe dysplasias, 30% in moderate dysplasias and less than 5% in mild dysplasias. Increased risk of malignant transformation in lesions showing epithelial dysplasia has been documented, it seems that not all of those lesions showing dysplasia will eventually become malignant, some may even regress. Since epithelial dysplasia does not seem to be invariably associated with or even a necessary prerequisite for malignant development, it may be necessary to develop other methods for predicting the malignant potential of pre-malignant lesions.

**CONCLUSION**

Oral potentially malignant lesions are characterized most frequently by the appearance of white patches (leukoplakia) on

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**Table 1: Criteria for grading of oral epithelial dysplasia**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Levels involved</th>
<th>Cytological changes</th>
<th>Architectural changes</th>
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<tbody>
<tr>
<td>Hyperplasia</td>
<td>N/A</td>
<td>None</td>
<td>Thickened epithelium Hyperkeratosis Normal maturation</td>
</tr>
<tr>
<td>Mild</td>
<td>Lower third</td>
<td>Cell and nuclear pleomorphism Nuclear hyperchromatism</td>
<td>Basal cell hyperplasia</td>
</tr>
<tr>
<td>Moderate</td>
<td>Up to middle third</td>
<td>Cell and nuclear pleomorphism Anisocytosis and anisomucleosis Nuclear hyperchromatism Increased and abnormal mitotic figures</td>
<td>Loss of polarity Disordered maturation from basal to squamous cells Bulbous drop shaped rete pegs Basal cell hyperplasia Increased cellular density</td>
</tr>
<tr>
<td>Severe</td>
<td>Up to the upper third</td>
<td>Cell and nuclear pleomorphism Anisocytosis and anisomucleosis Nuclear hyperchromatism Increased and abnormal mitotic figures Enlarged nuclei and cells Hyperchromatic nuclei Increased number and size of nucleoli</td>
<td>Disordered maturation from basal to squamous cells Increased cellular density Basal cell hyperplasia Dyskeratosis (premature keratinization and keratin pearls deep in epithelium) Bulbous drop shaped rete pegs Acantholysis Secondary extensions (nodules) on rete tips</td>
</tr>
<tr>
<td>Carcinoma in situ</td>
<td>Full thickness</td>
<td>All changes may be present</td>
<td>Top-to-bottom change Loss of stratification</td>
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the oral mucosa. Diagnosis of dysplasia is subjective and considerable experience needs to be accrued before the significance of the variable features become fully apparent. Despite many alternative approaches conventional histopathological evaluation based on light microscopic examination of haematoxylin and eosin stained slides is still, the gold standard for assessing the malignant potential of preneoplastic head and neck lesions.

REFERENCES