The incidence of premalignant lesions and oral cancers is steadily increasing globally. In spite of advancement in early detection, there is increased mortality and morbidity related to oral cancers.\(^1\) Obviously early diagnosis of cancer; preferably at pre-invasive stage goes a long way to cure the disease. Colposcopy is a medical diagnostic procedure to examine an illuminated, magnified view of the cervix and the tissues of the vagina and vulva.\(^1\) Various authors have tried to adapt gynaecologic methods of examination to the oral mucosa because of the similarities, the oral mucosa shows with the female genital mucosa.\(^2\)

The word colposcopy is derived from the Ancient Greek word kolpos meaning "hollow, womb, and vagina" and skopos meaning "look at". The procedure was developed in 1925 by the German physician Hans Hinselmann, with help from Dr. Eduard Wirths.\(^2\) However, there is a relative dearth of research in this area of diagnosis and are only a few studies describe the value of colposcopy in the diagnosis of oral mucosal lesions.\(^2,3\)

In 1925 German physician Hans Hinselmann reported the construction of the first coloscope. For this purpose, he attached a light source to the Leitz binocular dissecting microscope. He connected the optical system to a stand which allowed movement in all directions and also supplied a small screw for fine adjustment. Until this time, a cervical tumour of the size of a pigeon’s egg was regarded as early. After the invention of the coloscope, Hinselmann was able to state that ‘with regard to the so called early concerns, colposcopy enables detection of considerably earlier cases. Even a tiny dot sized tumour did not escape detection. The magnification initially was however only around 7.5 times. Hinselmann thus opened up a completely new field of diagnosis and based his ideas on appearances never seen before.\(^4\)

Colposcopy is today the gold standard of examining the cervix, vagina and vulva under magnification using a Colposcope, a lighted binocular microscope connected to a video monitor that magnifies the area of interest 6-40 times its normal size, under an external white light for illumination. The higher powers are often necessary to identify certain characteristic vascular patterns that may indicate the presence of more advanced pre-cancerous or, cancerous lesions suggesting of the changes that are typical of epithelial dysplasia. Various light filters are also available to highlight different aspects of the surface epithelium. Acetic acid and iodine solutions (Lugol's or Schiller's) can also be applied to the surface epithelium to improve visualization of abnormal areas.

The main purpose of colposcopy is to detect intraepithelial and early neoplasia of the cervix, vagina and vulva.\(^5\) Most of the times, however, a colposcopic examination is indicated as an integral part of every gynaecologic examination in concert with cytological examination to further investigate a cytological abnormality on pap smears.\(^6,8\)

For intra oral lesions at present, though there are simple chair side methods including staining with toluidine blue and exfoliative cytology, there is a high risk of false positives, which can be as high as 30%.\(^2\) Questions have also been raised regarding the risks associated with the use of toluidine blue because it shows an affinity for DNA.\(^9\)

The image obtained is often considered the result of the reciprocal relationship between the epithelium and the underlying connective tissue stroma wherein the epithelium acts as a filter through which both the incident and the reflected light pass.\(^10\) The stroma appears red because of its rich vascularity. The intensity of colour represents the ratio of reflected and absorbed light and is related to the thickness of the epithelium, the optical density of the epithelium (i.e., the morphology and the organization of the epithelial cells), the vascularity and the nature of the underlying stroma.
The sensitivity of colposcopy though is dependent on a number of factors including the skills of the colposcopist, number of biopsies taken, and skills of the reading pathologist. Other limitations include cost, which if the cost of histopathology is included, may be prohibitive in low resource countries. An important area of application of colposcopy in oral mucosal lesions may well be in the diagnostic evaluation of the various oral pre-malignant lesions and frank oral cancers based on the vascular patterns. In a recent study, Pazouki et al concluded a close relationship between stromal vascularity and tumor progression in the oral mucosa. Also, because the equipment allows simultaneous viewing of surface cells as well as sub mucosal vessels, it is hoped that techniques will be developed for documentation without the need for vital staining. The comparative effects of different treatment modalities, such as radiation and chemotherapy, on the junction between the tumour and normal tissue could also be studied.

Also, most of the patients with oral squamous carcinomas have a marked inflammatory infiltrate interfering with the evaluation of dysplastic lesions. In comparison, biopsy specimens selected by direct intra-oral microscopy overcome this most common cause for the decreased sensitivity of biopsy outcomes in these sets of patients. Colposcopy thus aids in the distinction between chronic inflammatory lesions which can then be easily distinguished from dysplastic lesions by the assessment of the features noted in the examination. Colposcopy in oral cavity requires further clinical studies as oral malignancies are on the rise and early detection will help in prevention of frank malignancies.

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References: