

Assessment of Collagen Fiber Nature, Spatial Distribution, Hue and Its Correlation with Invasion and Metastasis in Oral Squamous Cell Carcinoma and Surgical Margins using Picro Sirius Red and Polarized Microscope

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ABSTRACT

Introduction: Oral squamous cell carcinoma (OSCC) comprises a bulk of all the oral malignancies and is posing a major health problem among the population. It is an established fact that tumor stroma plays a vital role in tumor progression. Therefore, methods to detect, quantify, and analyze collagen are of immense value in this regard. Picro Sirius red, which has the capability to detect thin fibers, although frequently used, is seldom exploited to the fullest extent.

Aim: Our goal is not only to identify nature of fibers, but also to assess the fiber hue and the spatial distribution of different colors in various grades of OSCC and correlate it with the metastasis of the tumor. The study has also analyzed the nature of stromal elements along the clear, close and involved surgical margins of OSCC.

Materials and methods: Ten cases each of well, moderately and poorly differentiated OSCC as well as clear, close and involved margins were stained with hematoxylin eosin and Picro Sirius red staining for evaluation under polarized microscope.

Results: In this study we found that the birefringence of the collagen fiber changed from orange red to yellowish green from well to poorly differentiated OSCC. The collagen fibers in well-differentiated carcinoma revealed polarizing colors of reddish orange around the tumor islands in the majority of the fields. To the best of our knowledge is not being studied so far in the English literature.

Conclusion: In the present study, it has been observed that stromal changes at the invading front of the tumor islands and with increasing grade of the tumor can be evaluated more efficiently with the use of Picro Sirius red stain.

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