SHORT COMMUNICATION

Muscle Invasion in Oral Squamous Cell Carcinoma: Should it be Taken More Seriously?

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Abstract

Introduction: Clinical and histopathological prognostic parameters of oral squamous cell carcinoma are the topics gaining much attention. One such parameter is muscle invasion in oral squamous cell carcinoma. Muscle invasion is extremely important to know the prognosis and disease outcome. It was found in many studies that muscle invasion is one of the most important predictors of a lymph node metastasis and a poor prognosis. This article focuses on the clinical utility of muscle invasion.

Discussion: Muscle invasion although known as a distinct feature in oral squamous cell carcinoma; it's clinical utility is not yet established. Studies have shown muscle invasion to be as reliable as depth of invasion for cervical lymph node metastasis. It's convenience to diagnose and predict makes it more reliable.

Conclusion: Muscle invasion is a convenient prognosticator in oral squamous cell carcinoma and should be routinely reported.

Keywords: Cervical lymph node metastasis, Histopathological parameter, Muscle invasion, Oral cancer, Prognosis, Tumor depth of invasion.

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Introduction

Oral squamous cell carcinoma (OSCC) is one of the leading cancers, causing deaths worldwide. However, a lot of dilemma regarding the prognostic and disease outcome factors of the tumor still exists.[1] These factors have been discussed many times in the literature; however, the muscle invasion (MI) in OSCC has not been discussed thoroughly and needs further elaboration.

Discussion

MI is defined as the infiltration of extrinsic skeletal muscle bundles by malignant cells, recognized on the microscope[2] (Fig. 1). A very few studies were done exclusively on MI, its clinical relevance, and its prognosis; therefore, its exact prognostic value or outcome has not been assessed.

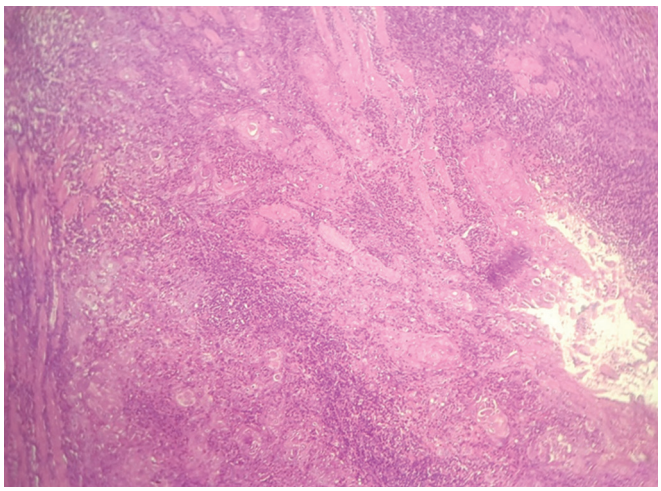

Fig. 1: Histopathological section reveals malignant cells invading the muscle fibers (H and E, 10×)

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One such study done by Min et al. has reported that MI by a squamous cell carcinoma of posterior mandibular alveolar ridge was associated with a cervical lymph node metastasis.[3]

Cervical lymph node metastasis, as a known fact, is one of the most important prognostic factors in OSCC. Their study kept the hypothesis that muscle contractures by these invaded malignant cells may facilitate the drainage of cells into cervical lymph nodes. The study also demonstrated better survival outcomes in patients without MI.[3]

Chandler et al. in their study have also demonstrated the utility of MI over a depth of invasion (DOI).[4] DOI is measured from the basement membrane of the closest adjacent normal mucosa to the deepest point of tumor invasion.[1] DOI is currently regarded as one of the most authentic indicator for the cervical lymph node

involvement. However, DOI is difficult to measure and does not have an accurate formula and there are different cutoff values quoted in different studies to complicate the matter. As also in frozen sections, DOI is regarded as a substandard predictor. On the other hand, MI is simple to diagnose and has more interobserver reliability and reproducibility.

MI is all the more convenient in frozen section settings over DOI to determine whether a lymph node dissection is needed for a particular case.[4] This makes MI a worthy predictor of prognosis according to this study.

Skeletal muscle invasion in an early tongue carcinoma has also been recently studied by Mani et al.,[5] which found 44% recurrence rate of tumors with MI.[2]

Tumors showing MI are regarded as more aggressive for another reason, which is their occasional presence, which is similar to the urothelial carcinomas. Doo et al. has stated that the reason for the occasional involvement of the malignant squamous cells into skeletal muscle could be due to the muscle motion, mechanical tumor destruction, inhospitable muscle pH, and also because of tumor cells which are known to remove lactic acid produced by the muscle cells, which induces neovascularity in the tissues.[5] Hence, this makes the point clear that those cells that overcome this sort of resistance may have more aggressive phenotypes.

Conclusion

From the above discussion it becomes clear that there is scope for bringing MI into serious consideration, as it can prove to be an impactful parameter in predicting the overall behavior and outcome of OSCC patients. There is a need of a proper clinicopathologic protocol to be designed to validate the histological prognosticators.

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