Can Pathological Differentiation Predict N-Status in Head and Neck Squamous Cell Carcinoma?

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Abstract

Objectives: Discover the correlation between pathological differentiation at surgery and nodal status in head and neck squamous cell carcinoma (HNSCC) treated initially with excision and neck dissection (ND).

Methods: This is a retrospective review of a cohort of 162 patients treated with surgical resection and ND for HNSCC from Feb, 1995 to Mar, 2006, at one site in Calgary, AB, Canada. Patients were excluded from the study (see Figure 1). The correlation between pathological differentiation in the surgical specimen and pathological N-stage was determined by the Chi squared test and a simple logistic regression model.

Results: It was determined that only 1 out of 19 patients with well-differentiated HNSCC were pathologically N+. Of those patients with moderately differentiated tumors, 27 out of 51 were N+ (52.9%), and patients with poorly differentiated tumors, 8 out of 8 were pathologically N+. (71.0%). The correlation between nodal positivity and pathological N-status was determined to be statistically significant by the Chi squared test.

Conclusion: The results of this study suggest a relationship between the pathological differentiation status and pathological nodal status in HNSCC.

Methods: The pathology reports were reviewed initially by a medical student (MK) as well as one of the senior authors (JCD). The association between pathological differentiation in the surgical specimen and pathological nodal status was determined using a Chi square test as well as univariate logistic regression.

Introduction

• The degree of differentiation in head and neck squamous cell carcinoma may be a prognostic indicator; however, it is not yet included in any staging system [1]. The primary objective of this study is to determine whether the degree of differentiation, as reported by the pathologist can predict an important clinical outcome, such as lymph node status.

• Biomarkers and molecular profiling has proved very useful in some cancers but their utility has not been fully stalking in HNSCC [2]. Considerable expertise is required for the measurement and interpretation of biomarkers and in many countries the resources and expertise needed to use biomarkers clinically does not exist.

• In head and neck squamous cell carcinoma (HNSCC) the degree of differentiation (well, moderate, poor) is commonly, but not always, reported by pathologists [3]. Although often reported this information is commonly used by clinicians for treatment decision making or prognostication. We therefore hypothesized that a simple measure such as histologic differentiation might be a useful adjunct to the commonly used TNM staging system when evaluating the clinical behavior of a tumor.

• Our hypothesis was that degree of differentiation as reported by the pathologist would predict whether or not a patient developed nodal metastasis, thereby predicting ultimate clinical outcome. Patients with “low risk” pathology (i.e. well-differentiated) might require less aggressive treatment.

• We studied the relationship between differentiation of the primary tumor and nodal status on final pathology. We conducted a retrospective review of a cohort of 162 patients undergoing surgical resection for HNSCC from Feb, 1995 to Mar, 2006.

• Of the 78 eligible patients included in this study, 61 were male, and 17 were female. The mean age of the patients at the time of surgery was 59.8 years.

• Patients were excluded from the study if the differentiation was not included in the pathology report. If the patient had an unknown primary tumor, previous radiation treatment or radiation treatment on the surgical specimen including neck dissection, if the pathology report was missing or if N status was not reported (Figure 1).

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Discussion

• Using logistic regression, we calculated that patients with well-differentiated tumors are 7.9 times more likely to be N0 than those with moderate or poor differentiation status. Moreover, this correlation (between differentiation and nodal status) yields a statistically significant Chi squared test.

• The power of the study would be enhanced by increasing the number of patients, indicating the need for more research in this area. This can best be addressed with a multi-center prospective trial.

• The results suggest a statistically significant correlation between pathological differentiation and pathological nodal status. On the basis of our preliminary results, a more detailed analysis is warranted.

• Of the patients with well differentiated SCC, 1 out of 19 was pathologically N+ (5.26%). In the group of moderately differentiated SCC patients, 27 out of 51 were pathologically N+ (52.9%), and among the patients with poorly differentiated SCC, 6 out of 8 were pathologically N+ (71.0%).

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• A Chi square test to determine the association between pathological differentiation and pathological nodal positivity showed a statistically significant result (χ² = 10.374, p = 0.001). In a simple logistic regression model, we found an Odds Ratio of 7.9 (95% CI = 2.3-26.5). Patients with poorly-differentiated tumors are much more likely to be pathologically N+ compared to those with moderately- or well-differentiated tumors. Adjustment for confounders was not performed at this time, but is planned for future analysis.

• The results of this study suggest a relationship between the pathological differentiation status and pathological nodal status in HNSCC.

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