ABSTRACT

Objectives: To retrospectively review patients with human papilloma virus (HPV) associated oropharyngeal squamous cell carcinoma (OPSCC) for the presence of retropharyngeal lymph nodes (RPLN) before and after treatment and to determine the utility of RPLN in predicting outcomes.

Study Design: Retrospective cohort study

Methods: Two hundred and thirty patients with a diagnosis of HPV associated OPSCC were identified from 2002 to 2013. The presence of RPLN was determined from findings on Positron Emission Tomography and contrast enhanced Computed Tomography (PET/CT) both pre- and post-treatment.

Results: Of the 230 patients, 148 had both pre- and post-treatment imaging available for review. Five patients (3.4%) had RPLN pre-treatment, and two (1.4%) were found to have RPLN post-treatment. None were positive for RPLN both before and after treatment. Among patients positive for RPLN pre-treatment with an average follow-up of 2 years, four patients (80%) were found to have no evidence of disease, and one patient (20%) was alive with recurrence in the neck. Both patients positive for RPLN post-treatment were found to have no evidence of disease on serial imaging. No significant association between RPLN status and patient outcome was identified in this study.

Conclusions: This is a unique investigation utilizing PET/CT to classify RPLN status in HPV associated OPSCC. RPLN were a relatively uncommon finding in our HPV associated OPSCC cohort compared to the quoted positivity of 10-27% in all OPSCC. A combination of PET/CT is useful in identifying RPLN. Prospective investigation will be needed to determine the precise impact of RPLN on HPV associated OPSCC treatment and outcomes.

METHODS

Patient Eligibility:
- Diagnosis was based on p16 positivity on immunohistochemistry and/or HPV positivity on in situ hybridization.
- Patients were mostly treated with concurrent chemoradiation.
- Those with PET/CT scans before and after treatment were investigated for RPLN positivity in the official radiology report of their imaging.

PET/CT imaging:
- RPLN positivity was defined as a lesion measuring 10 mm or larger in the shortest diameter on PET/CT and interpreted as a retropharyngeal node by the radiologist on the imaging report.

RESULTS

Baseline characteristics of the 148 patients meeting criteria with pre- and post-treatment imaging who were included in the study are shown in Table 1. Five patients (3.4%) had RPLN pre-treatment and two (1.4%) were positive for RPLN post-treatment. Table 2 shows RPLN positivity rates by component of pre- and post-treatment PET/CT.

The location of the primary tumor in all RPLN positive patients was either the base of tongue (29%) or tonsils (71%); however, there was no statistically significant association between tumor site and either RPLN status or clinical outcome. Four of the seven (57%) had exposure to >14 units of alcohol per week. The association between alcohol and RPLN positivity approached significance (p=0.058). One of the seven patients with RPLN had N3 disease, two had N2c disease, and three of the seven patients had N2b disease. There was no statistically significant association between stage and RPLN status. Additionally, RPLN positivity was not associated with patient outcomes. Table 3 shows patient outcomes by RPLN status.

DISCUSSION

This study’s key finding is that the prevalence of RPLN in HPV associated OPSCC appears to be substantially lower than that reported by previous studies, which describe OPSCC without stratifying by p16/HPV status (3.4% vs. 10-27%). This may represent a difference in pathophysiology in HPV associated OPSCC when compared with non-HPV associated OPSCC. Because previous studies documented the prevalence of RPLN in OPSCC without differentiating etiology, they may have been unable to identify differences in RPLN positivity between subgroups. This study also contributes to the growing body of literature on the use of PET/CT for use in the staging and surveillance of HPV associated OPSCC.

Another important finding of this study was the lack of any association between RPLN and the outcome for the patient. Previous studies of RPLN in OPSCC suggested that node positivity conferred a worse prognosis, but again these studies included OPSCC cases of all etiologies, rather than HPV associated OPSCC only. Our findings are consistent with recent studies showing that nodal status in HPV associated oral and oropharyngeal tumors does not have an impact on outcomes (Klozar et al.) or prognosis (Straetmans et al.).

CONCLUSION

This is a unique investigation utilizing PET/CT to classify RPLN status in HPV associated OPSCC. RPLN were a relatively uncommon finding in our HPV associated OPSCC cohort with pre-treatment nodal positivity of 3.4% compared to the quoted positivity of 10-27% for all OPSCC. A combination of PET/CT was found to be useful in identifying RPLN. Furthermore, the lack of an association between RPLN status and outcome was consistent with recent studies showing a diminished prognostic influence of lymph nodes in HPV associated OPSCC. Prospective investigation will be needed to determine the precise impact of RPLN on HPV associated OPSCC treatment and outcomes.

REFERENCES


