Can Radiographic Tumor Volume of Oral Squamous Cell Carcinoma Help Predict Clinical and Pathological Tumor Features?

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Purpose

- Radiographic tumor volume (RTV) of oral squamous cell carcinoma (SCC) is seldom measured in practice.
- Aims of the study are to estimate RTV of SCC and to investigate its relationship with clinical and pathological stage, tumor margin status, recurrence, and need for chemo/radiation.

Methods

- The design is a retrospective cohort study
- The predictor variable is SCC RTV
- The primary outcome variables are clinical and pathological tumor size
- The secondary outcomes are margin status and postoperative chemo/radiation
- Tumor dimensions were measured on preoperative maxillofacial or neck computer tomography images with contrast.
- Information on patient and tumor characteristics was obtained. Pearson correlation, t test, ANOVA and log rank test were used for statistical analysis. The significance level was set at .05

Results

Thirty-six subjects aged 36 to 86 were included in the study. Positive association was found between clinical T stage and RTV (P = .0003) and between pathologic T stage and RTV (P = .002). Mean value of RTV was significantly higher in the group with positive margins (P = .0004). RTV was significantly higher in cancers requiring adjuvant chemo/radiation (P = .033). Mean RTV for patients with recurrence was 1.86 cm3 as compared to 1.29 cm3 for patients with no recurrence. Higher tumor volumes were more likely to be associated with recurrence.

CT of the neck with contrast in the coronal plane, showing representative craniocaudal tumor measurement (red line)

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Discussion & Conclusion

- We aimed to estimate tumor RTV and compare it with clinical and pathological stage, as well as to explore trends of RTV in relation with tumor margin status, chemo-radiation use, and tumor recurrence
- The hypothesis was proven true and showed an association:
  - Between SCC preoperative RTV with both clinical and final pathological tumor stage
  - As well as an association between RTV and final pathological margin status, postoperative chemoradiation use, primary tumor recurrence status.
- This allows clinicians to anticipate surgical and adjuvant therapy contingencies, such as chemo/radiation.
- Ultimately, we suggest that RTV measurement may allow to improve the characterization and recurrence prediction of the SCC in addition to the current TNM staging. This may be used as a building block to design a prospective tumor size specific volumetric study.