

UFHCC Research Day 2017 | Abstract Template

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TITLE:

Intensity modulated radiation therapy (IMRT) dose to Glottis as risk factor for dysphagia

HYPOTHESIS:

We predict that increased dose of radiotherapy (beyond 35 Gy) to the glottis results in development of dysphagia.

BACKGROUND/AIMS:

While it is known that the glottis is a dysphagia/aspiration related structure with predictive capacity for development of dysphagia following IMRT, less is known about the epiglottis or subglottal trachea, which also receive radiation during therapy. The goal of this study was to determine the relationship between radiation dose to the glottis, epiglottis, and subglottal trachea, and swallowing.

METHODS:

This is a retrospective study of patients who received evaluation of swallow function and have undergone definitive treatment for head and neck cancer with IMRT. Exclusion criteria includes those who have undergone extensive surgical reconstruction (including major oral cavity resections, total laryngectomy), unilateral neck irradiation, oral cavity cancer diagnosis without lymph node involvement (as determined either by positive nodes during dissection, positive margins or extra-capsular extension) and pre-morbid dysphagia with silent aspiration identified during routine clinical baseline evaluation. Thirty-three patients referred to UF Health Davis Cancer Center's Radiation Oncology clinic met inclusion/exclusion criteria. Chart review of all patients referred for swallow evaluation by either Head and Neck Surgeon or Radiation-Oncologist were identified as candidates. The dose-contouring plan specific to the trachea, glottis and epiglottis was determined via chart review by the study Radiation-Oncologist. We used computerized tomography axial contouring plans which are created for every patient anticipating IMRT and are taken every 3mm, thus we used the dose assigned 3 slices, or roughly 1 cm below the glottis for *tracheal dose* and the slice corresponding with posterior glottis for *glottal dose* as well as superior dose approximate to constrictors assigned *epiglottic dose*. We reviewed videofluoroscopic evaluations of swallow function for documented penetration/aspiration with the Dynamic Imaging Grade of Swallowing Toxicity (DIGEST) scores for both safety and efficiency of swallow. Safe swallow was defined as PA score 1 or 2.

RESULTS & CONCLUSIONS:

ROC analysis for swallow safety determined cut-points for dose to glottis as 29 Gy with 90% sensitivity (45% specificity), and for the epiglottis 63 Gy with 90% sensitivity (52% specificity); subglottal trachea dose was not significant in this model. Using these cut-points we recoded dose groups into binary variables and used multivariate analysis to evaluate differences between dose groups on DIGEST scores. Results showed significant differences for DIGEST scores between glottal dose groups ($F(3,1)=13.471, p=.001$) but not epiglottal or tracheal dose groups ($p>.05$).