Purpose or Objective: At our center, the need for neck dissection (ND) after radiotherapy (RT) is determined based on the nodal response on the post-RT Computed Tomography (CT) study 4 months after the end of treatment. We want to report the outcome of this approach and investigate whether characteristics on pre- and post-RT CT studies can predict the necessity of post-RT ND.

Material and Methods: Between 2002 and 2012, 183 consecutive patients with lymph node-positive head and neck cancer (HNC) were treated with RT or concurrent chemoradiotherapy (CRT) without planned ND. CT studies pre- and post-treatment were reviewed for lymph node size and presence of necrosis, extracapsular spread and calcifications. At patient level, data were correlated with 3 year regional control (RC), metastasis free survival (MFS), disease free survival (DFS) and overall survival (OS). At nodal level, data were correlated with relapse of the individual lymph nodes (LN). A stepwise selection procedure was followed to construct a multivariable prediction model for regional relapse (RR) within 3 years. The area under the ROC curve (AUC) was determined for the selected model. Additionally a bootstrap-corrected AUC value was calculated. This AUC value corrects for overoptimism resulting from the fact that model construction and model validation were performed on the same data set.

Results: The median follow-up was 60 months. 3-year outcome rates were as follows: LC of 84%, RC of 80%, MFS of 74%, DFS of 61%, OS of 63%. Pre-treatment nodal size at patient- and nodal level and presence of necrosis at patient level were associated with a poor outcome. This was also the case for post-treatment lymph node size and presence of necrosis and extracapsular spread (Table 1). Based on our results we developed a multivariate model for RR prediction. After implementing a stepwise selection procedure pre-RT T stage (p<0.02), post-RT necrosis (p=0.03) and post-RT largest nodal diameter (p=0.01) were included in the model. The AUC of this model was 0.78 (95% CI 0.63-0.84); the bootstrap-corrected AUC was 0.74 (95% CI 0.67-0.89). The risk for RR within 3 years can be calculated using the following formula:

$$P(RR) = 1 / (1 + e^{-\beta})$$

where $P(RR)$ is the probability of regional relapse and $\beta$ is the regression coefficient estimated from the model.

Conclusion: Characteristics on the post-RT CT study can predict the likelihood of residual lymph node disease and outcome. Characteristics on the pre-treatment CT study seem less useful for this purpose. A CT-based multivariable prognostic model based on our findings was developed which can aid in predicting RR.

EP-1041
Evaluation of dysphagia in head and neck cancer patients undergoing Intensity Modulated Radiotherapy
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Purpose or Objective: With the success of Intensity Modulated Radiotherapy (IMRT) techniques in reducing the severity of xerostomia in head and neck cancer (HNC) patients, efforts should be made to improve swallowing dysfunction, which is potentially even more discomforting and incapacitating side effect and adversely affects the quality of life. This is a clinical dosimetric study to investigate the correlation between radiation doses delivered to organs at risk for radiation induced swallowing dysfunction (SWOARS) and severity of dysphagia following concurrent chemoradiotherapy to HNC patients and evaluate various factors which assume importance in determining the risk of dysphagia/ aspiration.

Material and Methods: 60 Head and Neck cancer patients (Oropharynx 28, Hypopharynx 12 and Larynx 20) were enrolled between May 2013 and June 2014 for this prospective longitudinal study after prior approval from the hospital ethics and review committee. Patients were treated with curative intent by radiotherapy using IMRT and concurrent chemotherapy using cisplatin (40 mg/m2) on weekly basis. Delineation of SWOARS was done using RTOG guidelines and following structures were contoured: superior, middle and inferior pharyngeal constrictor, cricopharyngeal muscle, esophageal inlet muscle, cervical esophagus, base of tongue, supraglottic and glottic larynx. Dysphagia endpoints included both patient-reported (EORTC Head and Neck Quality of Life instrument and MD Anderson Dysphagia Inventory) and observer-rated scores (Common Terminology Criteria for Adverse Events- CTCAE v4.0 and RTOG/EORTC Late Radiation Morbidity Scoring). Patients were assessed weekly during radiation and at 1 month and 3 months after completion of treatment. Correlation between dysphagia and radiation doses to SWOARS was assessed.

Results: With an increase in the mean dose to the SWOARS, the grades of dysphagia also increased. After 3 months of completion of treatment, 27% patients had persistent dysphagia of grade 3 or grade 4. Significant correlation was observed between patient reported dysphagia scores and the mean doses to the superior and middle pharyngeal constrictor as well as glottic and supraglottic larynx (p<0.05). Observer rated dysphagia scores correlated significantly with mean superior pharyngeal constrictor dose and not with dose to other SWOARS. Two patients of carcinoma hypopharynx developed stricture which correlated significantly with dose to esophageal inlet muscle.

Conclusion: Radiation therapy plans sparing SWOARS should be generated and implemented to prevent the problem of dysphagia. The structures whose damage may cause dysphagia and aspiration are the pharyngeal constrictors and the glottic and supraglottic larynx. Further studies are required to evaluate dose constraints to these SWOARS to reduce the incidence of radiation induced dysphagia and thus further improve the quality of life in HNC patients.

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Risk-factors in pT1-2N0M0 squamous cancers of the oral cavity and the role of adjuvant radiotherapy
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