

versus (vs) 66 of 103 patients HUM ($P = 0.17$). Of these insertions, 32 were acute in CTL vs 22 HUM arm ($P = 0.16$). FT types in CTL were 18 NG, 52 PEG, 3 both vs 15 NG, 48 PEG, 1 both, and 1 TPN in HUM arm. The number of patients with FT in situ at 2 years was 5 CTL vs 2 HUM arm. Duration of FT insertion was partly influenced by individual site policy. Median total duration of FT insertion was 141 days CTL vs 148 days HUM arm. For the ITT population (duration = 0 when no insertion), median duration was 104.5 days CTL vs 70 days HUM arm. Kaplan-Meier analysis of this total FT duration data showed a nonsignificant trend favoring reduction in HUM population ($P = 0.09$). HNRQ per protocol analyses estimates were in the direction favoring HUM with less symptom severity, although most time points did not reach significance.

Conclusion: These non-significant trends are consistent with the hypothesis that HUM may influence long term symptom burden and FT use, providing an interesting context to current discussions hypothesizing what influence the severity of acute mucositis may have on subsequent pathophysiological processes that correlate or associate with late adverse outcomes after HNC RT.

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The Value of Prognostic Nutritional Index in Predicting Outcomes and Guiding Treatments for Nasopharyngeal Carcinoma Patients Treated by Intensity Modulated Radiation Therapy

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Purpose/Objective(s): The purpose of this study was to investigate the significance of the prognostic nutritional index (PNI) in predicting the prognosis and guiding the treatment choices for nasopharyngeal carcinoma (NPC) patients treated by intensity-modulated radiotherapy (IMRT).

Materials/Methods: Five hundred thirty-nine patients with newly diagnosis stage I-IV NPC who received radical IMRT with or without chemotherapy were retrospectively analyzed. The PNI was calculated as $10 \times \text{serum albumin (g/dl)} + 0.005 \times \text{total lymphocyte count (per mm}^3\text{)}$. All patients were split randomly into a training set ($n = 239$) and a testing set ($n = 300$) for analysis. The receiver operating characteristic (ROC) curves were calculated to identify the cut-off value of PNI and tested its prognostic validity. Survival curves were calculated by the Kaplan-Meier method and differences were compared with a log-rank test. Univariate and multivariate analysis were applied to identify the prognostic factors.

Results: Of the 539 patients, 63.8% patients received concurrent chemoradiotherapy (CCRT) with or without neoadjuvant/adjuvant chemotherapy. The median follow-up time was 101.3 months. The five-year loco-regional recurrence-free survival (LRRFS), distant metastasis-free survival (DMFS), disease-specific survival (DSS), and overall survival (OS) of the whole cohort was 90.7%, 85.8%, 85.3%, and 83.1%, respectively. The cut-off value of PNI was 52.0 in the training set, which was significant in predicting DMFS, DSS, and OS in testing set and all patients (all $P < 0.05$). Multivariate analysis showed PNI was an independent prognostic factor on DMFS ($P = 0.004$), DSS ($P < 0.001$), and OS ($P < 0.001$) in the whole cohort. In order to explore the role of CCRT in the different PNI subclassifications of patients with stage II-IV, 220 patients who received CCRT alone were analyzed. In these 220 patients, 62 patients were in PNI ≤ 52.0 , and 158 patients were in PNI > 52.0 . The 5-year DMFS, DSS, OS in patients with PNI ≤ 52.0 were significant worse

than those with PNI > 52.0 (76.0% vs. 86.4%, $P = 0.039$; 71.8% vs. 87.8%, $P = 0.008$; 67.7% vs. 84.8%, $P = 0.008$).

Conclusion: Our results suggest that PNI is a reliable independent prognostic factor in NPC patients treated with IMRT. For locoregionally intermediate and advanced NPC patients with PNI ≤ 52.0 , CCRT alone could not achieve satisfactory treatment outcome, and further studies on treatment optimization are needed.

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Improvement of Target Definition for Laryngeal and Hypopharyngeal Cancer on Computed Tomography, Magnetic Resonance Imaging, and 18-FDG Positron Emission Tomography Validated by Histopathology

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Purpose/Objective(s): Validation and improvement of target definition on CT, MRI and 18-FDG-PET with histopathology of laryngeal and hypopharyngeal tumors.

Materials/Methods: Twenty-seven patients with T3/T4 laryngeal/hypopharyngeal cancer underwent a CT, MRI, and 18-FDG-PET scan before total laryngectomy. H&E-sections were obtained from the surgical specimen on which tumor was delineated by one pathologist. The GTVs on CT and MRI were delineated in consensus between three observers. PET GTVs were automatically segmented by a Gaussian mixture model. The three-dimensionally reconstructed specimen was registered with the imaging. Modality dependent target margins were developed to cover at least 95% of the tumor outer contour in 95% of the patients. These margins make tumor coverage by the target volumes similar for the different modalities. The target volumes were reduced for anatomical boundaries and air. Target volumes were compared based on volume overestimation with the tumor volume and the target volume on CT with a 10 mm margin (TV10 mm), which is used in current clinical practice.

Results: Target margins of 4.4 mm (CT), 6.7 mm (MRI), and 5.5 mm (PET) were derived from comparison of GTVs delineated on imaging with tumor delineated on histopathology. Addition of these margins to the GTVs resulted in target volumes of 47 mL (CT), 50 mL (MRI), and 41 mL (PET), while the target volume according to clinical practice was 80 mL.

Conclusion: For laryngeal and hypopharyngeal tumors, 25%-45% target volume reduction is possible when modality dependent target margins are used compared with the target volume used in current clinical practice. PET-based target volumes were smallest, closely followed by CT-based target volumes.

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The Effects of Induction Taxotere, Platinum, and Fluorouracil (TPF) Chemotherapy in Patients With Stage III and IVA/B Nasopharyngeal Cancer Treated With Concurrent Chemoradiation Therapy: Long-Term Results of 2 Parallel Phase 2 Clinical Trials

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Purpose/Objective(s): Concurrent chemoradiotherapy (CCRT) is the standard strategy for locally advanced nasopharyngeal cancer (NPC). The effect of induction chemotherapy plus CCRT in locoregionally advanced NPC is unclear. We examined the long-term outcomes of the addition of