a 1:1 matched propensity score matched older cohort. The cohorts were matched including: gender, ECOG performance status (PS), pT- and pN-categories, primary tumor subsite (oral tongue vs other subsites), resection margin status, and presence of extranodal extension (ENE). The primary endpoint was 5-year overall survival (OS, measured by Kaplan-Meier method), and secondary endpoints were 5-year locoregional failure (LRF, analyzed by competing risk method), and disease-free survival (DFS, evaluated by Kaplan-Meier method).

**Results:** A total of 57 patients were identified in the younger (<40) cohort which had a median follow up of 4.3 (0.1-13.6) years, and 441 in the older (40-70) cohort who had a median follow up of 2.7 (0.2-9.4) years. Among the younger (<40 yo) cohort: median age was 33 yo, 24 (42%) females, 35 (61%) non-smokers, and 25 (44%) non-drinkers; bilateral and ipsilateral neck dissection was performed in 12 (21%) and in 30 (53%), respectively. Postoperative radiation therapy was given in 23 (40%), and concurrent chemotherapy in 15 (26%). Before applying the propensity score matching, a comparison of the younger cohort (n=57) and entire older cohort (n=441) showed that younger patients, had better ECOG PS (PS 0-1 98% vs 94%, p = 0.022), less smoking history (37% vs 67% p =<0.01), had more oral tongue primary tumor site (81% vs 46%, p<0.001), fewer pT3-4 (18% vs 45%, p<0.001), less frequent pN+ (42% vs 65%, p<0.001), and less pMNE+ (17% vs 34%, p = 0.01), a similar proportion received chemotherapy (28% vs 26%, p = 0.76). The young patients had better 5 year OS (82% [95 CI 71%-93%] vs 66% [60-71%] p = 0.008), better 5 year DFS (66% [54%-81%] vs 54% [49%-60%] p = 0.031), and less LRF (26% [16%-43%]) vs 31% [27%-37%] p = 0.18). Following propensity score matching (50 patients in each matched cohort); there was no significant difference between the younger and older cohort in 5-yr OS (81% [70%-94%] vs 71% [59%-85%], p = 0.18), 5-yr DFS (63% [49%-80%] vs 64% [52%-79%], p = 0.49), and 5-yr LRF (28% [17%-47 %] vs 32% [21%-48%], p = 0.29).

**Conclusion:** OSCC patients under 40 yo have better ECOG PS and pathologic features compared to the 40-70 yo counterparts. With prognostic factors matched (50 patients in each matched cohort); there was no significant difference between the younger and older cohort in 5-yr OS (81% [70%-94%] vs 71% [59%-85%], p = 0.18), 5-yr DFS (63% [49%-80%] vs 64% [52%-79%], p = 0.49), and 5-yr LRF (28% [17%-47 %] vs 32% [21%-48%], p = 0.29).

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**2920**

**PET-CT as a Predictor of Regional Nodal Involvement in Head and Neck Squamous Cell Carcinomas by Disease Subsite**

**Purpose/Objective(s):** PET-CT as a comparison of the younger cohort (n=57) and entire older cohort (n=441) showed that younger patients, had better ECOG PS (PS 0-1 98% vs 94%, p = 0.022), less smoking history (37% vs 67% p =<0.01), had more oral tongue primary tumor site (81% vs 46%, p<0.001), fewer pT3-4 (18% vs 45%, p<0.001), less frequent pN+ (42% vs 65%, p<0.001), and less pMNE+ (17% vs 34%, p = 0.01), a similar proportion received chemotherapy (28% vs 26%, p = 0.76). The young patients had better 5 year OS (82% [95 CI 71%-93%] vs 66% [60-71%] p = 0.008), better 5 year DFS (66% [54%-81%] vs 54% [49%-60%] p = 0.031), and less LRF (26% [16%-43%]) vs 31% [27%-37%] p = 0.18). Following propensity score matching (50 patients in each matched cohort); there was no significant difference between the younger and older cohort in 5-yr OS (81% [70%-94%] vs 71% [59%-85%], p = 0.18), 5-yr DFS (63% [49%-80%] vs 64% [52%-79%], p = 0.49), and 5-yr LRF (28% [17%-47 %] vs 32% [21%-48%], p = 0.29).

**Conclusion:** OSCC patients under 40 yo have better ECOG PS and pathologic features compared to the 40-70 yo counterparts. With propensity score matching, younger and older cohorts have comparable survival and tumor control. The clinical impression of poor outcomes for patients aged less than 40yrs may represent recall bias.


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**2921**

**3D-printing non-co-planar template-assisted computed tomography-guided I-125 seed interstitial brachytherapy for recurrent head and neck squamous cell carcinomas after external beam radiotherapy: Preliminary one-arm study**

**Purpose/Objective(s):** We report and review herein the preliminary results of recurrent head and neck squamous cell carcinoma (HNSCC) treated with 3D-printing non-co-planar template (3D-PNCT)-assisted CT-guided radioactive I-125 seed (RIS) interstitial brachytherapy after external beam radiotherapy (EBRT), as a salvage modality to analyze the feasibility, efficacy, and safety of this treatment.

**Materials/Methods:** Forty-two patients with recurrent HNSCC after EBRT were enrolled from April 2016 to June 2018 in Peking University 3rd Hospital. The KPS scores ranged from 60 to 90 (median, 80). The prescribed doses were 100–180 Gy. The activity of a single I-125 seed was include the tumor bed and bilateral necks. Recent efforts to decrease volumes in patients with a pathologically node negative (PN0) neck have resulted in excellent rates of regional control. However, surgical management of the contralateral neck can result in added toxicity. Therefore, in this study we sought to identify the reliability of PET-CT imaging in detecting regional nodal involvement. Based on prior studies we hypothesized a negative predictive value (NPV) of 75-99%, but sought to evaluate differences in NPV based on anatomical sub-site and tumor characteristics at diagnosis, which have not previously been reported.

**Materials/Methods:** Patients with newly diagnosed HNSCC tumors of the oral cavity (OC), oropharynx (OPX), larynx (LX), and hypopharynx (HPX), who underwent surgical resection and bilateral neck dissection (ND) with pre-operative imaging were included. Clinically negative necks included those without palpable adenopathy or involvement on imaging. We excluded patients with prior malignancies, synchronous malignancies at diagnosis, and prior head and neck surgery. Descriptive statistics were used to evaluate tumor characteristics at baseline. Using [18F]fluorodeoxyglucose positron emission tomography with computed tomography (PET-CT) as a reference, ipsilateral (IL), and contralateral (CL) neck involvement were both analyzed with positive predictive values and negative predictive values. These were further evaluated in subgroup analysis by disease subsite and tumor characteristics.

**Results:** Between 2006 and 2018, a total of 308 patients met inclusion criteria and 234 (76.0%) patients were male. Disease sites included 90 (29.2%) OC, 87 (28.2%) OPX, and 131 (42.5%) LX and HPX. Using AJCC 8th edition staging 114 (37.0%) had T4 disease and 101 (32.8%) had N0 disease. A total of 213 (68.9%) patients had a PN0 CL neck. The anatomical midline (MLI) was involved in 201 (65.3%) patients. In patients with a pre-operative PET-CT (n = 271, 88.0%) the NPV was 80.3%, this included an NPV of 69.0% for the IL neck and 85.7% for the CL neck. NPV did not significantly differ by disease subsite or neck laterality except for the OPX. Within this subsite, the NPV for the IL neck was 42.9% versus 86.2% for the CL neck (p<0.05). Furthermore, the NPV in the CL neck for patients with T4 disease was lower than in patients with T1-T3 disease (70.2% v. 83.3%, p<0.04). Notably, the NPV in the IL neck for patients with MLI was lower compared to patients who did not have MLI (63.4% v. 82.4%, p<0.02).

**Conclusion:** In the management of HNSCC PET-CT has an excellent NPV particularly in evaluation of the contralateral neck; however, this may differ by tumor specific characteristics. Confirmation of these findings with further PET-adapted studies may aid in the selection of appropriate candidates for volume reduction for the low risk/elective clinical target volume.