Purpose or Objective: The radiation therapy of head and neck tumors is burdened by high toxicity to organs at risk (OARs) with consequent administered dose limitations to the target and compromised clinical outcome. We investigated the contribution of functional/biological imaging obtained by Positron Emission Tomography (PET/CT) in Gross Tumor Volume (GTV) and Clinical Target Volume (CTV) definition of primary tumor and regional lymph nodes in head and neck cancer, for a more accurate target delimitation resulting in lower toxicity to OARs.

Material and Methods: From March 2103 to June 2014 we examined 51 patients with head and neck cancer and defined clinical volumes with the aid of only morphological CT images and with the aid of diagnostic PET/CT images. Then we evaluated, through tests of statistical significance, the overlap of GTV and CTV obtained with each of the two methods respectively. Moreover usefulness of PET/CT in preventing geographic errors for a more accurate target definition, resulting in peritumoral tissues preservation and less toxicity to the OARs, was evaluated as well. The influence of two different imaging techniques in TNM staging, which is important for treatment planning, was investigated.

Results: In 33 of 51 patients the TNM staging obtained by PET/CT was similar to that performed by CT images, but in 39% of the cases the primary tumor GTV defined by PET/CT was significantly smaller and restricted compared to that defined by CT only (p <0.016). Due to the better GTV definition in terms of size and location, the OARs are potentially better preserved. In 12 patients the more accurate definition of tumor margin made possible by PET/CT produced a different T than that obtained with CT evaluation only; in 6 patients PET/CT identified metastases to regional lymph nodes not assessed with CT images only. It was not observed significant variation of the nodal volumes.

Conclusion: The use of PET/CT imaging allows the realization of more precise target volume and better defined clinical volumes, with a possible better preservation of the OARs and lower toxicity. Functional imaging PET/CT helps the radiation oncologist not only in the process of treatment planning, but has the potential advantage of identify treatable disease not highlighted on morphological CT images. It is therefore recommended to use a PET/CT scan in the radiotherapy planning process in order to achieve a more appropriate treatment planning in head and neck tumors.

EP-1084

Elderly patients concomitant radiotherapy + cetuximab in locally advanced head and neck cancer

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Purpose or Objective: Concomitant radiotherapy + cetuximab has shown superiority to exclusive radiotherapy for locally advanced head and neck cancers (LAHNC). Data on this association are scarce for the elderly despite its rising incidence. Initial clinical trials that led to its approval have not included patients>70 years. The objective of this study was to assess efficacy and toxicity of concomitant radiotherapy and cetuximab for patients aged>70 years with LAHNC.

Methodology: Thirty-five patients were included between 2006 and 2012. Median follow-up was 22 months. Median age was 74 years (70-86). Median performance status was 1(0-2), Female/male sex ratio was 0.34. Tumor sites were: Oropharynx(57.1%), larynx(20%), hypopharynx(14.3%), oral cavity(2.9%), rhinopharynx(2.9%), lymph node with unknown primary(2.9%). Using TNM classification, tumors were: T1(5.9%), T2(35.3%), T3(35.3%), T4(22.9%), N0(26.6%), N1(8.6%), N2(48.6%), N3(14.3%). Median radiotherapy dose was 70 Gy(60-70). 40% of patients were treated with intensity-modulated radiotherapy, the rest were treated with conventional 3D radiotherapy. 94.3% of patients paused radiotherapy due to toxicity. 29% had a cetuximab dose-reduction and 1 patient had a definitive interruption. Median survivals were respectively: 49 months for overall survival(Standard-Error (SE)=8) and 32 months for relapse free survival(SE=10). Two-year local-regional relapse and metastatic relapse free survivals were respectively 99%(SE=10) and 74%(SE=10). Median body mass index (BMI) was 24.6(17.3-38) before treatment and 23, 24 after treatment(16.3-34.7). Median weight variation was 4 kilograms(-16 to +6). Ninety-four percent of patients had nutritional support: 37.8% had oral nutritional supplements only, 56.8% had enteral nutrition and 2.7% parenteral nutrition. Skin reaction and mucositis were the major toxicities recorded. Toxicities details are reported in table 1.

Results: EGFR expression in head and neck cancer : does it have a role as prognostic factor in radiotherapy?

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Purpose or Objective: In an era of personalized treatment there is a great interest in identifying factors which might help to predict patient response to RT. EGFR role in this...
setting remains still controversial, despite the large consensus as a promising candidate to become a biomarker that could further improve application and efficacy of radiation therapy (RT) in head and neck squamous cell carcinoma (HNSCC). Moreover, most of the studies refer to series of patients who underwent RT alone or in combination with Cetuximab. We performed a retrospective analysis on the prognostic value of EGFR expression in HNSCC treated with surgery and postoperative RT.

Material and Methods: We analyzed 69 patients with an histological diagnosis of HNSCC who underwent adjuvant RT after surgery in our Institute from 1997 to 2003. A 3D conformal RT was delivered with a 6MV accelerator using a conventional fractionation (median 60 Gy, range 34.2-70 Gy) Median follow-up was 3.73 years (range 0.17-12.25 ys). None of these patients were treated with postoperative concomitant chemotherapy. Tumor samples used for the determination of EGFR were obtained from surgical specimens. Membrane features (intensity, extension, distribution) and percentage of EGFR expression were evaluated and a statistical analysis (uni-variate) was conducted to correlate these parameters with Overall Survival (OS) and Disease Free survival (DFS).

Results: EGFR was overexpressed in 45.5% of our patients (median value used as threshold). No significant correlation (p value= 0.90) has been found between patients with an overexpression of EGFR and OS or DFS. Among patients with laryngeal carcinoma, those with overexpressed EGFR have showed a lower OS (not statistically significant) and DFS (p=0.05). Considering separately the membrane features, the intensity of the EGFR staining has been found statistically correlated with both OS (p= 0.03) and DSF (p=0.001). Moreover, a stratification of patients was performed combining extension and intensity of EGFR immunolabelling in tumour cell membranes, and their distribution following a three-point score: patients with 3+ score (intense and complete labelling and patchy distribution) presented the lowest OS and DFS and the difference was highly significant for both OS and DFS (p< 0.0001). The same result was observed in the subgroup of patients with a diagnosis of larynx carcinoma.

Conclusion: Based on our results it is still reasonable that the analysis of EGFR expression, especially referring to membrane features, might be a prognostic value for OS and DFS in locally advanced HNSCC treated with adjuvant RT. A clinical validation in prospective trials of the suggested three-point score system could be useful to select patients with worse prognosis that might benefit from more aggressive treatments.

EP-1086
Finding the right threshold for determining hypoxic subvolumes in F-MISO-PET/CTs for HNSCC
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Purpose or Objective: Tumor hypoxia is a common feature of locally advanced head and neck cancer (HNSCC) that is associated with higher malignancy and increased radioresistance. Tumor-to-blood ratios ≥1.2 are generally thought to indicate hypoxia. Nevertheless, previous studies use various thresholds to define tumor hypoxia. The following analysis tries to elucidate which threshold may be the most appropriate to determine hypoxic volume in respect to treatment success.

Material and Methods: A prospective study was performed to determine changes in tumor hypoxia during primary chemoradiation (pRCTx) of HNSCC at our institution. Tumor hypoxia was non-invasively assessed by [18F]-Fluoro-Misonidazole (F-MISO) PET/CT 2.5 h p.i. at baseline (week 0) and in week 2 and 5 of treatment, respectively. Hypoxic volumes (HV) were generated using thresholding at different levels of 1.2, 1.3, 1.4, 1.5 multiplied with the background-uptake, which was defined as SUVmean within the ipsilateral trapezium muscle, as advised by a nuclear-medicine specialist. Δ-values of decrease of HV (ΔHV) during treatment were obtained in weeks 0, 2 and 5 and correlated with local failure. As four patients showed local failure (LF), two groups of four patients each were made: four showing LF, four patients showing complete remission (CR). Before t-test analysis normal sample distribution was confirmed with Shapiro-Wilk test. Significance-level was defined as p<0.005.

Results: We analysed 4 patients without local failure in comparison to 4 patients with LF to show differences of Δ-values in weeks 0 to 2, 2 to 5 and 0 to 5 of the HV. All patients primarily treated for HNSCC with dRCTx were included. Each patient received a total dose of 70 Gy in 35 fractions. Concomitant cisplatin chemotherapy was administered in weeks 1, 4 and 7. The mean follow-up time was 16.9 months (range: 10-22 months). Mean time to LF was 9.5 months (range: 6-15 months). For patients in CR allΔ -HV (mean) show proportional decrease in weeks 0 to 5. This is true for every threshold factor from 1.2 to 1.5. In those patients showing LF,Δ -HV (mean) demonstrates not only a decrease in HV but also some increase at each of the time increments. There is a general decrease (p=0.0073) between week 0 and 5, while between week 0 and 2 and 2 and 5, a rise inΔ -HV(mean) can be shown (p=0.2339, p=0.0649, respectively).

Conclusion: A decrease inΔ -HV (mean) was shown at any time point, for any factor the tumor-to-background-ratio was multiplied with, in patients with CR. In patients with LF, the hypoxic volume showed inconsistence over time, at least at one time of measurement there was an increase in hypoxic volume. The choice of the threshold for determination of hypoxic volume in FMISO-PET/CT remains a crucial question that could not be answered at this point. To elucidate this larger patient numbers are needed.

EP-1087
Screening for symptoms in HNC: Italian translation and validation of a patient-reported outcome
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Screening for symptoms in HNC: Italian translation and validation of a patient-reported outcome
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