fractionated radiation treatment is assumed to be decisive for treatment success. [18F]-Fluoro-Misonidazole PET (F-MISO-PET) allows noninvasive assessment of hypoxia during treatment. The purpose of the present study was to noninvasively assess the time course of tumor hypoxia.

Material and Methods: A prospective serial imaging study was conducted in patients undergoing definitive chemoradiation (dRCTx, total dose 70 Gy) for locally advanced HNSCC, accompanied by cisplatin in weeks 1, 4 and 7. Tumor hypoxia was assessed by F-MISO-PET by static scans acquired 2.5 h p.i. Tumor volumes were determined for FDG PET/CT scans and the coregistered F-MISO/CT scans. At baseline MRI, FDG-PET/CT and F-MISO-PET were acquired (week 0). Additional F-MISO-PET/CT scans were acquired in treatment weeks 2 and 5. Normal sample distribution was confirmed with Shapiro-Wilk test. Unpaired t-test analysis of the mean SUVmax(tumor)/SUVmean(muscle) ratios of F-MISO-PET in weeks 0, 2 and 5 were performed. Significance level was defined as p<0.005.

Results: Between 2012 and 2014 18 patients (16 men, two women, mean age 60 years), treated for HNSCC with dRCTx were included. All received a total dose of 70 Gy in 35 fractions. Concomitant cisplatin chemotherapy was administered in weeks 1, 4 and 7. 14 patients had all F-MISO-PET scans, while 4 had two F-MISO-PET scans (week 0, 5). The mean follow-up time was 14.6 months (range: 4 - 28 months). Mean SUVmax(tumor)/SUVmean(muscle) in weeks 0, 2 and 5 were 1.9 (n=18, SD ± 0.1), 1.5 (n=14, SD ± 0.1) and 1.2 (n=18, SD ± 0.1), respectively. Unpaired t-test for SUVmax(tumor)/SUVmean(muscle) between week 0 and 5 was performed, showing a significant decrease (p<0.0001). Between weeks 0 and 2 (p=0.0346) and between weeks 2 and 5 the decrease again was highly significant (p=0.0113). In two patients no residual hypoxia was measured in week two, resulting in SUVmax(tumor)/SUVmean(muscle) <1.0. In week 5 this was found in seven patients. In two patients hypoxia had increased in week 2 but decreased in week 5 compared to pre-treatment measurements. In one patient hypoxia had increased by the end of treatment.

Conclusion: Differences in hypoxia between weeks 0-2, 2-5 and 0-5, respectively, show statistical significance. This is crucial in the process of re-oxygenation. As concluded in previous works, change of treatment strategy, e.g. by means of dose escalation might be most efficient early during treatment. However further analysis, with more patients and correlation to disease-free and overall-survival are needed.

EP-2060 Correlation of imaging data with known predictive/prognostic factors in Oropharyngeal cancer
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Purpose or Objective: There is increasing interest in maximising data extraction from the multimodality imaging performed in cancer patients in order to predict treatment outcomes. This is particularly relevant in Oropharyngeal cancer where concomitant chemoradiotherapy is the standard treatment for stage III and IV disease but there is significant variation in patient outcomes and both treatment intensification and de-intensification strategies are being investigated.

The aim of this prospective pilot study was to look at how data obtained from pre- and per-treatment 18F-FDG-PET/CT scans and textural features from pre- and per-treatment contrast enhanced planning CT scans correlated with known prognostic indicators including smoking history and HPV status.

Material and Methods: Eligible patients included those undergoing primary concomitant chemoradiotherapy for Stage III/IV SCC of the Oropharynx. Each patient underwent a contrast enhanced planning CT and an 18F-FDG-PET/CT scan immobilised in the treatment position prior to the start of treatment and then again after 8-10 fractions of radiotherapy. The SUVmax and SUVmean were recorded on both the pre- and per-treatment planning CT scans. The smoking history for each patient was established on enrolment to the study and HPV status was determined using p16 IHC on biopsy of the primary tumour. Ethical approval was gained from the relevant bodies.

Results: Eighteen patients were recruited. HPV status was positive in 13 patients and negative in 5 patients. The SUVmax/mean in HPV negative patients was 21.6/13.3 on the pre-treatment 18F-FDG-PET/CT versus 15.2/10.5 for HPV positive patients (p=0.09/0.25). Pre-treatment CT texture analysis showed a difference in the normalised entropy between the two groups with a significant difference detected using the smallest filter (p=0.04). The SUVmax/mean on the pre-treatment 18F-FDG-PET/CT for patients with no or minimal smoking history (<10 years) was 13.7/9.5 versus 19.1/12.9 for those with a smoking history of >10 years (p=0.1/0.13). No significant difference in the entropy/entropy ratio between the two groups was detected. No significant differences were shown in the change in SUV or entropy ratio between the pre- and per-treatment scans in any of the groups.

Conclusion: These results suggest differences in the imaging characteristics between patients in different prognostic categories may be detected at the pre-treatment stage and are worthy of further investigation in a larger patient cohort and may in the future add further information to that provided by the molecular profiling of tumours. This study did not show any significant differences in the data obtained between patients in terms of their early response to treatment however this data can be revisited once follow up data for this patient cohort matures.

EP-2061 Over-expression of EGFR and/or cox-2 in locally advanced squamous cervical cancer (LASC)
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Purpose or Objective: This study looking for the prognosis value of over-expression of EGFR and/or COX-2 in patients with locally advanced squamous cervical carcinoma (LASC).
Material and Methods: 118 patients with FIGO IB2-IVA stage were treated with RT-CT radical (Tab A). Anti-EGFR monoclonal Ac. (clone H11 Ref. M-3363 -Dako). The Immunoreactivity was based on semiquantitative analysis scored as the % of stained cells. Moderate/high EGFR staining (>31 to ≥70%, respectively) were considered (+). Anti-COX-2 monoclonal Ac. (clone CX-2999 Ref. M361 - Dako). Moderate/high COX-2 staining (>31 to ≥70%, respectively) were considered (+). Pelvic radiotherapy in 21 patients with RT-3D, dose 46 Gy. In 97 cases (82%) was extended to the para-aortics, dose 45 Gy. A single application of LDR BCT was delivered on 51 pts (43.5%). Isotope: Cs-137. Dose to point A: 30 Gy. HDR BCT to 64 pts (54%) in 3 or 4 applications. Isotope: Ir-192; Microselectron®. Dose 30 Gy to point A (33 pts) and a dose of 7 Gy to CTV/application (31 pts). CT: CDDP: 40 mg/m²/ iv weekly.

Results: Mean time follow-up for 118 pts: 56.5 months ±DS 10.5 (median 56). Mean time follow-up of lost pts (8): 48 months ± DS 10.5 (median 46). Clinical characteristics and treatments in Tab nº1 and nº2.

EGFR: 33 pts without overexpression vs. 85 pts (72%) with overexpression. COX-2: 77 pts without overexpression vs 41 (35%) with over-expression. 24% were EGFR/COX-2 (+), 58% were EGFR (+)/ COX-2 (-) or vice versa and 18% were EGFR/ COX-2 (-). 94 pts (80%) with CR, 22 pts with PR and 2 pts stabilisation. Actuarial DFS at 3/5 yrs:79% (CI 95%: 70-85) and 77% (CI 95%:68-84). Actuarial PFS at 3/ 5 yrs:71% (CI 95%: 62-78) for both. Actuarial PFS at 3/5 yrs:81% (IC 95%: 72-87) for both. We observed 13 local failures, 4 regional failures, 6 joint failures; 1 pure para-aortic failure, 9 exclusive metastasis to distance. We found that EGFR overexpression is age related >50 yrs old (p=0.01). The most advanced stages (III-IVA) are related to joint overexpression of both markers (p=0.02). Tab nº3 and nº4 summarize our results.

The EGFR overexpression or COX-2 or both together, did not reach significance in the univariate analysis for DFS and PPFs.

Conclusion: We did not find an association between overexpression of EGFR and/or COX-2 regarding the DFS and PPFs, despite being described in literature that these markers play a role in tumoral biology and in its evolution. There is a need for homogeneous, prospective studies with a standardized determination for these markers.

Electronic Poster: Radiobiology track: Cellular radiation response

EP-2062

c-Myc silencing impairs oncophenotype and radioresistance of Embrional Rhabdomyosarcoma Cell Lines. F. Marampon1, G. Gravina1, C. Festuccia1, C. Alessandro1, E. Di Cesare1, V. Tombolini2

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Purpose or Objective: We previously reported that the disruption of MEK/ERK/c-Myc axis affects in vitro and in vivo growth, angiogenic signaling and radiosensitivity of the embryonal rhabdomyosarcoma (ERMS) cell lines. Herein, we investigated the role of c-Myc in vitro invasion, migration, neo-angiogenesis and radioresistance of ERMS cells.

Material and Methods: RD and TE671 cells expressing the c-Myc dominant negative MadMyc chimera protein or shRNA-c-Myc were used.

Results: c-Myc depletion affected ERMS cells in vitro migration and invasion abilities by reducing the sialylation levels of NCAM and decreasing the MMP-9, MMP-2 and u-PA gelatinolytic activity. Although c-Myc down-regulation affected HIF1-α, VEGF and TSP1 proteins expression, no effects were seen in vitro neo-angiogenesis. Rapid, but not prolonged, c-Myc down-regulation radiosensitized ERMS cells by impairing the expression of DSB repair proteins such as RAD51 and DNA-PKcs but not Ku80.