Purpose/Objective: Conformal radiotherapy involves irradiation of large volume of normal tissue with low and medium doses, which biological relevance is not clear yet. Here we aimed to compare effects associated with local body irradiation during treatment of two differently located solid tumors: head and neck cancer (HNC) and prostate cancer (PC). About 120 HNC and 120 PC patients were enrolled into the study. All patients were subjected to radical IMRT with maximum GTV doses in the range 50-73.8 Gy and 74-76 Gy, respectively. Acute mucosal toxicity and gastrointestinal/gentourinary toxicity was assessed. Three consecutive blood samples were collected before, during and after RT. The endogenous serum peptidome was profiled using MALDI mass spectrometry. Furthermore, serum proteins were analyzed using label-free LC-MS/MS ‘shotgun’ approach in complete sets of samples representing 20 patients from each cancer group.

Results: In case of HNC patients radiation-induced changes in serum peptidome accumulated constantly during the treatment and their highest level was detected soon after the end of RT (~60% of components changed their abundance at significance level p<0.0001 between pre- and post-exposure samples). Moreover, changes in serum peptidome correlated significantly with intensity of acute mucosal irradiation during treatment of two differently located solid tumors: head and neck cancer (HNC) and prostate cancer. Serum proteome features were used as a surrogate for general reaction of whole patient’s organism to radiation.

Materials and Methods: Here we compared effects associated with local body irradiation during RT of two solid tumors: head and neck cancer (HNC) and prostate cancer (PC). About 120 HNC and 120 PC patients were enrolled into the study. All patients were subjected to radical IMRT with maximum GTV doses in the range 50-73.8 Gy and 74-76 Gy, respectively. Acute mucosal toxicity and gastrointestinal/gentourinary toxicity was assessed. Three consecutive blood samples were collected before, during and after RT. The endogenous serum peptidome was profiled using MALDI mass spectrometry. Furthermore, serum proteins were analyzed using label-free LC-MS/MS ‘shotgun’ approach in complete sets of samples representing 20 patients from each cancer group.

Results: In case of HNC patients radiation-induced changes in serum peptidome accumulated constantly during the treatment and their highest level was detected soon after the end of RT (~60% of components changed their abundance at significance level p<0.0001 between pre- and post-exposure samples). Moreover, changes in serum peptidome correlated significantly with intensity of acute mucosal reactions and volume of normal tissue irradiated with low-to-medium doses. In contrast, in case of PC patients majority of radiation-induced changes were detected 2-3 weeks after start of RT and their extend was less significant (~30% of components changed their abundance at significance level p<0.05). Furthermore, correlations between changes in serum peptidome and escalation of radiation toxicity or volume of tissues irradiated at low/medium doses were not detected.

OC-0266
Air-liquid culture system from primary cells to study normal tissue effects of combination therapies for lung cancer
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Purpose/Objective: Treatment of lung cancer with combinations of surgery, chemotherapy, and radiotherapy (RT) is a major challenge because of dose limiting toxicities of the surrounding normal tissue, preventing tumor control. A better understanding of normal tissue damage response and repair after treatment is needed to improve local control, QoL and outcome. The NOTCH pathway is a key regulator of normal lung development and it is important in lung cancer progression and response to RT. Notch inhibitors are currently being tested in clinical trials but little is known on how normal lung tissue is affected.

Materials and Methods: In order to study the effect of novel radio-sensitizers in different combination treatments on normal lung tissue we used a multilayer ‘air-liquid interface’ culture system from primary bronchial epithelial patient derived cells (PBEC). These cultures are typically composed of proliferative basal cells and the differentiated ciliated and mucus producing cells. The expression of Notch receptors, ligands and target genes was determined using qPCR and Immunoblotting.

Results: Here, we studied cell population changes in the multilayer bronchial epithelium under normal conditions and after treatment with Notch inhibitors and/or radiation. Upon treatment with NOTCH inhibitors ciliated cells increased at the expense of the mucus lineage whereas Notch activation increased mucus cell populations. These changes were consistent with cell-type specific marker expression and NOTCH specific target gene expression. The data presented will be on the consequences of different scheduled treatments including Notch inhibitors and (fractionated) irradiation.

Conclusions: The multilayer ‘air-liquid-interface’ culture system provides an ideal model for studying cell fate changes upon therapy in normal broncho-epithelial cells. The Notch pathway plays a key role on the regulation of the cell fate decision in our model.

OC-0267
The impact of an adult radiation late effects clinic on breast cancer survivorship
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Purpose/Objective: Radiotherapy is a key modality within the multidisciplinary management of breast cancer. A late effect (LE) following radiotherapy for breast cancer may occur many months or years afterwards, present significant management issues and adversely impact quality of life. To identify the LE prevalence, management and potential needs in breast survivorship an audit was performed of the patients referred to the Adult Radiation Late Effects Clinic at a tertiary care centre.

Materials and Methods: Following institutional research ethics board approval, a retrospective review of a prospective radiation late effects research database was undertaken. Data regarding patient demographics, staging, clinical variables (surgery, systemic and radiotherapy), type and onset of late effect, LE management interventions, adverse events, and LE outcomes were abstracted. Descriptive and summary statistics, including range and percentage, were used in analyzing the patient characteristics and outcomes using SPSS 22.

Results: From 02/2003 to 12/2012, 117 women were referred for LE consultation. Mean age at the time of LE referral was 59 y (33-78) with 60 L, 46 R and 1 L and R and 20 in-situ and 97 invasive cancers. Mean BSA was 1.75 (1.37-2.22) with 12 smokers and 30 ex-smokers. T stage was: 20 Tis, 55 T1, 42...