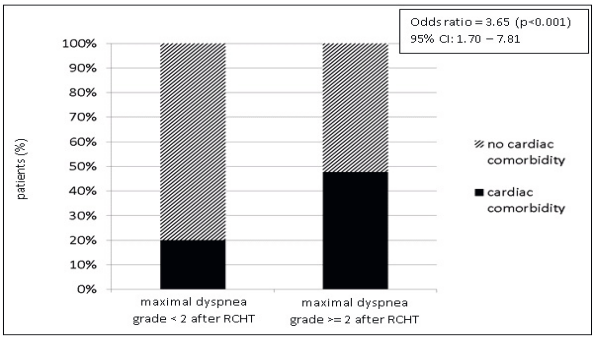
found (odds ratios of 1.02, 1.019, 1.70, 1.04, 0.99 with p-values 0.79, 0.3, 0.21, 0.88, 0.25 respectively in univariate analysis). We tested also whether our hypothesis is confirmed for the subset of patients with pre-treatment dyspnea grade 0 or 1, 124 (83.2%) patients, as high levels of dyspnea may well be due to congestive heart failure irrespective of RCHT. The results show an even higher odds ratio, 4.33 (p-value < 0.001, 95% CI: 1.76-10.67), of maximal dyspnea ≥ 2 for patients with cardiac comorbidity.

Figure 1. Frequency of RILT (measured by a CTCv3.0 dyspnea score within 6 months from the beginning of RCHT), for patients with/without cardiac comorbidity. The hypothesis that the odds ratio for post-RCHT dyspnea grade >=2 for the cardiac vs. no-cardiac comorbidity patients is equal to 1 is rejected (odds ratio = 3.65, p-value <0.001, 95% CI = 1.70-7.81), total number patients = 149.



Conclusions: Our results suggest that cardiac comorbidity is an important candidate factor for developing RILT after definite (chemo)radiotherapy of lung cancer patients. Therefore this observation should be further researched and externally validated.

PD-0455

Investigating a correlation between chemoradiotherapy schedule and survival in limited disease SCLC

F. Manapov[1], M. Niyazi[1], F. Oskan[1], G. Hildebrandt[2], G. Klautke[3], R. Fietkau[4], C. Belka[1]

[1]L.-Maximilians-Univ. Kl. Grosshadern, Radiation Oncology, München, Germany
[2]University Hospital Rostock, Radiation Oncology, Rostock, Germany
[3]Klinikum Sozial-Stiftung Bamberg, Radiation Oncology, Bamberg, Germany
[4]University Hospital Erlangen, Radiation Oncology, Erlangen, Germany

Purpose/Objective: Chemoradiotherapy (CRT) represents an actual treatment standard in limited disease small cell lung cancer (LD SCLC) and timing of thoracic irradiation (TRT) has been already the subject of randomised trials and meta-analyses. Several of them reported significantly improved overall survival (OS) when platinum-based early concurrent CRT is used. To investigate a correlation between CRT schedule and OS a temporal analysis of the multimodality treatment was performed in patients with LD SCLC.

Materials and Methods: 182 patients with PS WHO 0-3 who successfully completed CRT were retrospectively reviewed. Thoracic radiation therapy (TRT) was applied in the concurrent or sequential mode. Influence of the treatment mode and interval of simultaneous treatment (IST) (IST – an interval in days when chemotherapy and TRT were applied simultaneously, including also time between chemotherapy cycles) on OS was analysed.

Results: 70 (38%) patients were treated with concurrent and 112 (61%) with sequential CRT. Median survival (MS) for the entire cohort was 536 days (95% CI: 462 – 609) without difference between the groups (concurrent 599 vs. sequential 532 days, p = 0.9, log-rank test). IST was 0 in 112 (61%) patients treated with sequential CRT whereas in the concurrent CRT group 29 (16%) and 42 (23%) patients showed an IST < 35 and >35, respectively. Patients with IST < 35 demonstrated a trend to better OS (MS: IST 0 vs. >35 vs. <35 was 533 vs. 448 vs. 1169 days, p = 0.109, log-rank test). When patients treated with sequential CRT were excluded from the analysis, statistical difference in OS achieved significance (p = 0.021, log-rank test). In the multivariate analysis of patients treated with concurrent CRT, IST < 35 remained be significant variable correlating with better OS (p = 0.039, Cox regression).

Conclusions: Temporal analysis of CRT schedule revealed that IST < 35 can represent an important treatment-related parameter correlating with OS in patients with LD SCLC. By exceeding this interval we have seen no further improvement of OS due to concurrent application of the multimodality treatment.

PD-0456

Tumour outside the CTV decreases overall survival after neo-adjuvant radiotherapy for oesophageal cancer

C.T. Muijs[1], J.K. Smit[2], J.C. Beukema[1], V.E. Mul[1], A. Karrenbeld[3], G.M. van Dam[2], G.A.P. Hospers[4], P.M. Kluin[3], J.A. Langendijk[1], J.T.H. Plukker[2]

[1]University Medical Center Groningen / University of Groningen, Radiation Oncology, Groningen, The Netherlands
[2]University Medical Center Groningen / University of Groningen, Surgery, Groningen, The Netherlands
[3]University Medical Center Groningen / University of Groningen, Pathology and Medical Biology, Groningen, The Netherlands
[4]University Medical Center Groningen / University of Groningen, Medical Oncology, Groningen, The Netherlands

Purpose/Objective: Delineation of the gross tumour volume (GTV) in esophageal cancer remains difficult. Moreover, to compensate for microscopic tumour spread, the current standard is to use relatively large margins (3-4 cm) from GTV to clinical target volume (CTV). The aim of this study was: (1) to analyse the accuracy of GTV delineation; (2) to analyse if the margins to the CTV were sufficient at pathologic examination after neo-adjuvant chemoradiotherapy (neo-CHRT), and: (3) to investigate if pathological findings after neo-CHRT influenced overall survival (OS).

Materials and Methods: The study population was composed of 63 esophageal cancer patients treated with neo-CHRT. In all patients, planning-CT scans were used combined with all diagnostic information to determine the GTV and CTV. During surgery, the GTV and CTV borders, as delineated on the planning-CT scans, were demarcated in situ at the esophagus in order to provide information regarding the exact location of macroscopic and microscopic tumour (see Figure). Demarcation points consisted of anatomical reference points that could be easily recognised both at CT and intraoperative (e.g. tracheal bifurcation, aortic arch, celiac trunk). To identify prognostic factors for OS, univariate and multivariate analysis were performed.

Results: After resection, macroscopic residual tumour was found outside the GTV in 7 patients (11%). Microscopic residual tumour was located outside the CTV in nine patients (14%), in most cases caudally from the CTV. Three of these patients had an R1-resection, including 2 with circumferential invasion and only 1 with invasion of the cranial and caudal borders. Six patients were partial responders, while three showed almost no response. The median follow up was 16.6 months (95% CI 14-19 months). In the univariate analysis, microscopic tumour extension outside the CTV, ypN+, lymphangio-invasion, perineural growth, lymph node ratio >0.10 and >5 positive lymph nodes were associated with worse OS. In the multivariate analysis, only microscopic tumour extension outside the CTV (HR 4.96, 95%CI 1.03-15.36) and perineural growth (HR 5.77, 95%CI 1.27-26.13) were identified as independent adverse prognostic for OS. Without tumour outside the CTV the 1 year OS was 86% vs. 20% for patients with tumour outside the CTV (p=<0.01).

Conclusions: Despite using advanced pre-RT imaging and neo-CHRT, (1) macroscopic tumour outside the GTV was found in 11% of the patients and (2) microscopic tumour foci outside the CTV in 14% of the cases (mainly caudally from the CTV). (3) Moreover, the presence of microscopic tumour spread beyond CTV borders had a significant and major adverse impact on OS. These findings emphasize the importance of accurate delineation of the GTV and indicate that currently used margins from GTV to CTV in particular in caudal direction are not sufficient which may adversely impact treatment outcome.

PD-0457

Three dimensional pathology validation of PET-based autocontours in rectal cancer

J. Buijsen[1], M. Janssen[1], M. Nap[2], M. Öllers[1], A. Hoffmann[1], J. Van den Boogaard[1], G. Lammering[1], P. Lambin[1]

[1]Maastricht Radiation Oncology (MAASTRO), Radiotherapy, Maastricht, The Netherlands
[2]Atrium Medical Center, Pathology, Heerlen, The Netherlands

Purpose/Objective: The main weakness of the radiotherapy workflow is undoubtly the GTV delineation. It is therefore important to validate automated segmentation methods in 2D but even better in 3D. FDG uptake within a tumor, assessed with PET-imaging, can be used to automatically create a tumor contour using standardized uptake value (SUV) thresholding. It has already been shown that the tumor length measured in the surgical specimen correlates highly with a PET-based autocontour. The goal of this study was to validate the *volume* of an automatic generated PET-based tumor contour with pathology for rectal cancer.

Materials and Methods: Eight patients diagnosed with non-locally advanced rectal cancer (NLARC), referred for pre-operative treatment