Patients and Methods: Forty-nine patients (pts) were included from 14.02.2005 to 23.07.2008: median age 56(41−73), M/F = 4/45, PS 1/2 = 32/17, stage IIIA/IIIB = 10/39, squamous cell cc 36, large cell cc 2, adenocc 7, "non-small" carcinoma 4. Treatment consisted of 2 cycles of induction ChT, followed by concurrent chemoradiotherapy and consolidation ChT. When given as induction or consolidation chemotherapy, drugs were given in full doses: Vrb (25 mg/sqm, d1, 8, q21) and Cis (100 mg/sqm, d1, q21), or Carbo (AUC 5, d1, q21), in concurrent setting, doses were reduced: Vrb 15 mg/sqm, d1, 8, q21, Cis 80 mg/sqm, d1, q21 or Carbo AUC 4, d1, q21. Pre and post-induction ChT computed tomography defined the target volumes for radiotherapy. Patients who fulfilled the dose-volume histogram constraints, underwent dose escalation of radiotherapy, in cohorts of 7 pts, if no more than two grade 3 or one grade 4 toxicities occurred, until MTD. If one grade 3 and one grade 4 toxicities occurred, further expansion continued by 5 more pts.
Results: Forty pts underwent dose escalation in five cohorts: 64 Gy, 66 Gy, 68 Gy, 70 Gy, 72 Gy, without dose-limiting toxicity. For each dose level up to 7 pts were enrolled, with further expansion by five pts at 70 Gy dose level. Acute toxicities, in the 49 evaluable pts, were preponderantly mild, of grade 1 and 2. Severe grade 3 and 4 toxicities were: esophagitis in 4(10%), pulmonary toxicity in 7(14%), neutropenia in 8(16%) pts. There were 43% CR, 41% PR, 8% SD, 8%PD. RR.was 84%. With a median follow-up of 15.9 months, the 1-year survival rate was 83% (95% CI: 70−91). The mS has not been reached yet. Locoregional progression-free survival at 1 year was 77% (95% CI: 61−88).
Conclusions: As no MTD was reached during dose escalation this strategy has to be continued. RR and Survival data were promissing.

9108 POSTER

Mature results of an individualized radiation dose prescription trial based on normal tissue constraints in stage I-III non-small cell lung cancer (NSCLC)(NCT00573040)

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Background: We previously showed in a modeling and a phase I trial that individualized radiation dose escalation based on normal tissue contraints would allow safe administration of high radiation doses (van Baardwijk, Int J Radiat Oncol Biol Phys 2008). Here, we report the mature results of a prospective trial applying this individualized maximal tolerable dose approach.
Materials and Methods: Patients with stage III or medically inoperable stage I-II NSCLC, WHO-PS 0−2, an FEV1 and DLCO $\geqslant$30% were included. Patients were irradiated using an individualized prescribed total tumor dose (TTD) using normal tissue dose constraints (mean lung dose, MLD 10 to 19 Gy dependent on FEV1/DLCO, maximal spinal cord dose 54 Gy) up to a TTD between 54 Gy and 79.2 Gy in 1.8 Gy fractions BID. No concurrent chemo-radiation was administered; stage III patients received induction chemotherapy. The primary tumor and the initially PET-positive mediastinal lymph nodes were irradiated. Primary endpoint was overall survival (OS), secondary endpoints progression free survival (PFS) and toxicity (CTCAE v3.0). Results are expressed as median $\pm$ SD.
Results: 166 patients were included (115 males, 51 females; age 69 $\pm$ 10.4 years). Stage distribution: I 29%, II 10%, IIIA 22%, IIIB 39%. The gross tumor volume (GTV) was 50.3 $\pm$ 194.8 cc. The TTD was 64.8$\pm$11.4 Gy (EQD2 corrected for proliferation 62.5$\pm$9.0 Gy) with an MLD of 14.8$\pm$4.6 Gy, given in 36$\pm$6.3 fractions in an overall treatment time of 25.5$\pm$5.8 days. With a median FU of 31.6 months, the median OS was 21.0 months with a 1-yr OS of 68.7% and a 2-yr OS of 45.6%. Median PFS was 21.6 months; 75 patients (45%) had a recurrence (33% isolated loco-regional failure (LRR), 51% M+, 16% LRR and M+ as first event). OS and PFS was higher in tumors with a GTVmedian (resp p = 0.022 and p = 0.09) and EQD2> median (resp p = 0.012 and p = 0.013) and showed a trend in favor of stage I-II vs stage III (resp p = 0.05 and 0.17) and resectable vs unresectable tumors (resp p = 0.09 and p = 0.06). Based on multivariable analysis a higher GTV significantly decreased OS and PFS (both p < 0.001), while a higher TTD and EQD2 increased PFS (resp p = 0.017 and 0.008). Both acute and late toxicity were mainly mild. Acute dysphagia grade 3 was observed in 5% and was transient (late grade 3: 0%), while acute dyspnea grade 3−4 was seen in 10% (resp 8% and 2%) and late grade 3−4 in 5% (resp 3% and 2%). No myelitis was observed.
Conclusions: Individualized prescribed radical radiotherapy based on normal tissue constraints shows survival rates similar to concurrent chemoradiation schedules with mild toxicity.

9109 POSTER

Concomitant chemo-radiation (CRT) of locally-advanced NSCLC using weekly docetaxel: toxicity profile

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Background: Concomitant chemo-radiation (CRT) has been shown to be superior to radiotherapy (RT) without chemotherapy (CT) and to neoadjuvant chemotherapy followed by RT (NeoCTRT). It is not known which chemo-regimen is the optimal regimen. We have used concomitant weekly docetaxel. In this study we report the toxicity experienced with this regimen compared with patients treated with RT without concurrent CT treated at our institution.
Methods and Material: Data from patient files of a) 113 patients treated with RT in planned doses of 60−66 Gy without CT, b) 183 patients treated with NeoCTRT 60−66 Gy, and c) 37 patients treated with neoadjuvant CT followed by concomitant weekly docetaxel 20 mg/m^2 to a radiation dose of 60 Gy. All RT was applied 1995−2008 as 3-D RT in 2 Gy/F without elective nodal irradiation.
Results: The median survival in RT alone, NeoCTRT and CRT was 16.3, 15.6, and 20.5 months. The1 year survival was 60%, 61%, and 79%. However, the differences were not statistically significant. No grade 3+ hematological toxicity was found in the CRT group. Dyspnoe grade 3+ was not significant more prevalent in the CRT group, while esophagitis grade 3+ was. In a logistic regression analyses using dyspnoe grade 3+ as endpoint, only PS 2+ was a statistically significant factor, while analyzing esophagitis grade 3+ CRT and stage were of significance.
Conclusion: Use of concurrent docetaxel with RT resulted in an increased frequency of esophagitis grade 3−4 while the risk of pneumonitis did not change significantly. Although a trend for better survival with CRT was demonstrated, this was not statistically significant.

	N	Dyspnoe g3+	Dysphagia g3+	Treatment related deaths
a) RT alone	113	17.6%	1.9%	8
b) Neoadjuvant CT	183	22.8%	0.6%	5
c) CRT	37	27.8%	8.3%	3
p value CRT vs no-CRT		ns	<0.02	ns

9110 POSTER

Temozolomide as concomitant treatment to radiotherapy in non-small cell lung cancer patients with brain metastasis: a Galician lung cancer group study

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Background: Phase II and phase III trials have shown higher response and survival to radiotherapy when it is administered with temozolomide, in patients with brain metastasis from various primary tumors. We conducted a study to evaluate radiological response, toxicity, neurological progression, and survival of patients with brain metastasis secondary to a non-small cell lung cancer undergoing radiotherapy with concomitant temozolomide as compassionate use.
Materials and Methods: We included 24 patients aged >18, with non-small cell lung cancer and brain metastasis, who had not received previous holocraneal radiotherapy. They were administered 30 Gy of radiotherapy, in daily fractions of 300 cGy for 10 days, together with 72 mg/m^2 of temozolomide daily for 14 days. Metastasis progression and survival were estimated using Kaplan-Meier curves.
Results: Patients were mostly men (79%), with a mean age of 56.7 years, and histological diagnostic of adenocarcinoma or epidermoid tumor

(42% each). Most of the subjects had not received previous chemotherapy (67%), radiotherapy (83%), or radiosurgery (87.5%). Of the 21 patients that finished the study, 42% showed partial response (8% complete response), 33% improved their performance status, and 33% improved their neurological functional status. The median time to progression was 204 days. The proportion of surviving patients was 0.816 at 99 days and 0.497 at 180 days. As for toxicity, 8% of patients suffered grade III asthenia, and 4% suffered grade III thrombocytopenia.
Conclusions: The treatment of brain metastasis with temozolomide as concomitant treatment is associated to a 50% survival at six months, and a low degree of grade III toxicity.

9111 POSTER

Pathology-validated automated volumetric tumour segmentation in 4D-PET vs 3D-PET of NSCLC

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Background: It has been recommended to use a 42% threshold of maximum intensity to automatically delineate the primary lung tumor on a 3D ^{18}F-FDG-PET scan. However, for radiation treatment planning, 4D-PET scanning is increasingly being used. It is unknown whether the threshold recommended for 3D scans also applies to 4D scans. The aim of the current study was to compare the size of a primary lung tumor on 3D- vs 4D-PET as measured at the 42% threshold level, and to compare these sizes with the gold standard, being the size at pathology.
Methods and Material: 3D- and 4D-PET scans were obtained in 6 patients with NSCLC prior to surgery. The GTV was automatically determined using a 42% threshold level on both the 3D-PET and all 8 respiration phases of the 4D-PET. For the 4D-PET an average volume with standard deviation (SD) was calculated over the 8 phases for each patient. At pathology, the lung lobe was inflated with formalin. The fixated specimen was sectioned in parallel slices of approximately 5 mm, orthogonal to the longest axis. Digital photographs were obtained. About 40 microscopic sections per patient were analyzed encompassing the complete tumor. The area of the tumor on each slice was calculated, and multiplied with the slice thickness to derive the pathologic tumor volume. Both pathologic and PET volumes were converted to an effective diameter (ED) of the GTV, using: ED $((\text{volume} * \frac{3}{4} * (1/p))^{\frac{1}{3}})*2$. Finally, for both the 3D- and the 4D-PET, we calculated the ideal threshold level for each tumor by establishing the threshold value that yielded the volume closest to the pathologic volume.
Results: The ED of the 3D-PET overestimated the pathologic ED (28.4 mm$\pm$15.0 vs 24.4 mm$\pm$16.2, p = 0.046). Only a trend was observed regarding the overestimation of the ED with 4D-PET averaged over all phases compared to pathology (26.7 mm$\pm$14.1 vs 24.4 mm$\pm$16.2, p = 0.063). The ED varied also per respiratory phase, as indicated by the SD over the phases per patient (range: 0.37−2.6 mm). The ideal threshold level for the 4D-PET was 49.8%$\pm$7.8% on average for all phases, and 53%$\pm$8.1% for the 3D-PET. The variation in threshold values between the 4D-PET phases was of the same order of magnitude (range of SD: 0.9−5.8%).
Conclusions: For automatic thresholding of the volume of primary lung tumors on FDG-PET, different threshold levels should be used for 3D- vs 4D-PET. Data of more patients will be analyzed to investigate the optimal method for automatic delineation of lung tumors in 4D-PET.

9112 POSTER

Stereotactic body radiation therapy for peripheral lung tumours: a study in a French cancer center

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Background: The efficiency of Stereotactic Body Radiation Therapy (SBRT) in thoracic tumours becomes well known, while the evaluation of related toxicities is less described. A follow-up of all the pts treated in a French cancer center is described, focusing on the toxicity.
Patients and Methods: From June 2007 to December 2008, 31 pts, median 72 y. [54−86], were treated with SBRT for pulmonary tumour. 23 pts were treated for non-operated peripheral non small cell lung cancer (NSCLC), 3 pts for solitary metastasis (NSCLC n = 2, rectal cancer n = 1) and 5 pts for tumour of doubtful origin (NSCLC-solitary late metastasis of known cancer). 20 pts had histologicaly or cytologicaly proven tumour; in 11 cases, the diagnosis was retained without histological proof if tumour size increased or tumour was highly positive in PET-TDM without argument for another cause. SBRT was performed because of refusal of surgery (n = 1), or contraindications for surgery in 30 pts (comorbidities n = 24, previous surgery n = 6). Median forced expiratory volumes in 1 s (FEV1) before SBRT was 1.6 l [0.48−3.06]. Patients were immobilized in a Stereotactic Body Frame^{TM}. Breathing motion was limited with abdominal compression. Patients were treated with image guidance using Cone-Beam computed tomography before each fraction. 4 fractions of 10 Gy (n = 4), 12 Gy (n = 12) or 15 Gy (n = 13) or 8 fractions of 5 Gy (n = 2) were delivered on the 70% isodose (n = 28), 80% (n = 2) or 95% (n = 1) in 2 weeks, using 10−12 fields.
Results: With a median follow up of 13 months [2−32], 26 pts were alive and 5 had died (2 unknown causes without argument for toxic death, 3 metastatic progressions). Local control at 6 months was obtained for 26 on 28 evaluable pts (92%). During RT, asthenia gr.2 (n = 1), dyspnoea gr.2 (n = 1) and cough gr.2 (n = 1) were noticed. 29 pts were evaluated for acute toxicity (<3 months after the end of SBRT) while 2 pts had died before. 1 dermatitis (gr.2) was reported. After 3 months, 3 pts dyspnoea from gr. 3 to gr.4 (n = 3), from gr.2 to gr.4 (n = 1), and from gr.1 to gr.2 (n = 1), with images compatible with localized radiation pneumonitis on TDM in 3 pts (gr.2−3). No other toxicity was reported. Dosimetric studies for these pts will be presented.
Conclusion: SBRT for thoracic tumours is efficient and well tolerated. It is usually performed in high-risk pts suffering from severe comorbidities but indications must be carefully weighted against the risk of median-term toxicity, in particular for pulmonary function.

9113 POSTER

Palliative radiation oncologic therapy in lung cancer with superior vena cava syndrome

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Background: Lung cancer is the most common cause of superior vena cava syndrome (SVCS) and requires timely recognition and management. Radiotherapy is a succesfully proven, feasible and appropriate antineoplastic treatment for the palliation of this oncologic emergency. In order to study clinical profile of lung cancer with SVCS were studied retrospectively.
Patients and Methods: All lung cancer patients who presented with SVCS during last five years were studied. All 213 patients with SVCS with lung cancer; 194 (91%) male and 19 (9%) female. Age distrubutions were between 35−82 and most patients were in 5. And 6. decade (female median age 44, male 61). Neck edema was found in 177 (83%) patients, 112 (52.5%) had collateral veins and severe dyspnea, cough found in 123 (57.7%) and severe dyspnea were found in all patients. Localization of lesions were right in 188 (88.26%) and left in 25 (11.74%) of cases. Twenty seven were small cell lung cancer (18 disseminated, 9 localized) and 167 (78.40%) were nonsmall cell histology (44 epidermoid, 16 adenocarcinoma, 3 large cell and others nonclassified) and 19 (8.92%) patients were radiologically diagnosed and treated as emergency. According to TNM stage; 37 (17.37%) were in IIIB, 88 (41.34%) were in stage IV and 88 (41.34%) stage not stratified. Cough and dyspnea decreased in 55% of patients. Thirty four patients were died during therapy, 44% were dead in six mounths and only 1 year overall survival rate was 15.6%.
Conclusions: Radiotherapy is effective for paliation in SVCS with lung cancer; in our cases increased amount of patients needed radiotherapy as a firsth treatment especially in nonlocalized group. Nearly 10% of patients were female as an increasing proportion. Overall survival of patients were very poor and symptom control and increasing life quality is important but multimodality new treatments necessary for increasing life span of patients

9114 POSTER

Malignant pleural mesothelioma: the prognostic significance of different surgical treatments. A retrospective study from a single-institution experience

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Backgrounds: Optimal therapy in patients with Malignant Pleural Mesothelioma (MPM) is a matter of debate. Many authors questioned the role of