intention (5 with recurrent lung cancer, and 2 with metastasis from lung cancer). Platinum fiducials and intravascular embolisation coils were used as markers. In total, 180 markers were placed: 67 intrapulmonal in 26 patients (median: 3 markers per tumor), 84 intravascular in 28 patients (median: 3 makers per tumor), 25 extrapulmonal in 5 patients (median: 5 makers per tumor), and 4 markers in 1 patient with the bronchoscopic method. Seven days after marker placement, a planning CTscan was made and the GTV was contoured on a 4-D CT scan. The PTV equaled the GTV plus 5 mm. For early stage lung cancer, a total dose of 36 to 60 Gy, (median dose: 60 Gy) was given in 3 fractions. Solitary metastasis to the lung were treated with a total dose of 45 to 60 Gy (median dose: 45 Gy) in 3 to 5 fractions. For palliative treatment, a total dose of 30 to 49 Gy was given in 3-7 fractions (median dose: 40 Gy). The dose to the PTV was prescribed to the 70-85% isodose line. The response was evaluated according to the RECIST criteria with a CT scan 6-8 weeks after the last treatment and routinely thereafter. The median follow up with CTscan was 6 months (range: 2-18).

Results: Six patients (11%) had a pneumothorax after intrapulmonal placement. One patient had no symptoms. A thorax drain was placed in the 5 other patients. One patient complained of severe intrathoracal pain several hours after intravascular coil placement and 5 patients complained of haemoptoe, one after the intravascular coil placement and 4 after the intrapulmonal placement.

The local control was 97%. Seven tumors had a complete response, 38 tumors had a partial response, 13 tumors had stable disease and 2 tumors (both early stage lung cancer) were progressive, one after 8 months and the other after 15 months.

Conclusion: Low toxicity of marker placement was seen due to the 4 methods. CyberKnife tumor tracking with markers is feasible and resulted in excellent tumor response.

P3-046 **NT: Radiation Posters, Wed, Sept 5 – Thur, Sept 6**

Personalized High-Dose Continuous Hyperfractionated Accelerated Radiotherapy (HI-CHART) of non-small cell lung cancer (NSCLC) based on normal tissue constraints: a prospective clinical trial

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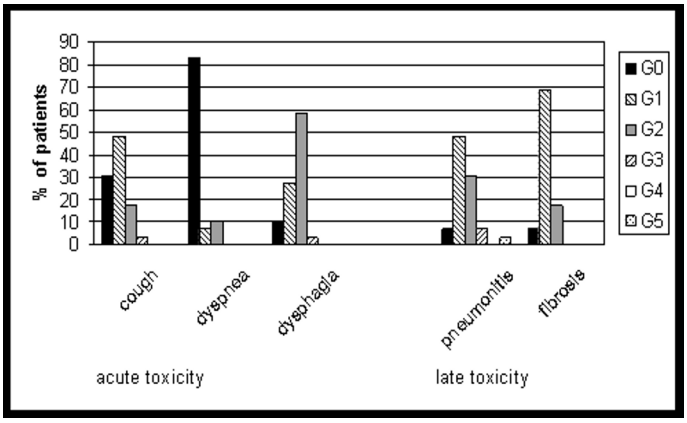
Background: Local recurrence is a major problem after (chemo-)radiation for NSCLC. We hypothesized that for each individual patient the highest therapeutic ratio could be achieved by increasing the total tumor dose (TTD) to the limits of the normal tissues, delivered within 5 weeks. In a theoretical model this resulted in an increase in tumor control probability from approximately 5% for a classical scheme (60 Gy in 6 weeks) to 25% for the study scheme. Here, we report the first results of a prospective clinical trial.

Methods: Twenty-nine patients with medically inoperable (stage I, n=2) or locally advanced NSCLC (stage III, n=27), in a good general condition (WHO-PS 0-1) and with a reasonable lung function (FEV1 >50% of predicted) were included. Most patients (25/29) received induction chemotherapy. All patients were irradiated using an individualized prescribed TTD, based on normal tissue constraints (mean lung dose 19 Gy, maximal spinal cord dose 54 Gy, no constraints for esophagus) up to a maximal TTD of 79.2 Gy. Radiotherapy was delivered in 1.8 Gy fractions, twice daily. Acute and late (>3 months) toxicity was scored using the CTCAE-criteria. A FDG-PET-CT scan (n=27) was performed to evaluate (metabolic) response 70 days after radiotherapy according to EORTC-criteria (PET) and RECIST-criteria (CT). The Kaplan-Meier method was used to compute overall survival.

Results: The mean delivered dose was 62.7 Gy (range 46.8-79.2 Gy). This corresponds to a mean biological equivalent dose of approximately 80 Gy (2 Gy fractions, once daily, in 8 weeks). Most patients experienced mild acute toxicity, while only 2 patients (6.8%) developed acute grade 3 toxicity (n=1 dysphagia, n=1 cough) as depicted in figure 1. Concerning late toxicity, 93% of patients (n=25) showed radiographic changes (75% in <25% and 18% in >25% of the lungs), while 12 out of 28 patients (43%) had clinical symptoms (>gr 1 pneumonitis). One patient (3.4%) died 51 days after radiotherapy due pneumonitis (treatment related mortality).



The post-radiotherapy PET-CT showed in 18 patients a metabolic response (41% complete metabolic response, 26% partial metabolic response), whereas only in 9 patients (33.3%) a response was seen on CT (p=0.01). Eight patients (29.6%) showed progressive disease, consisting of loco-regional progression (n=4), metastases (n=3) or a combination of both (n=1). With a mean FU of 13 months the mean overall survival was 16.7 months and a 1-yr survival of 65%.

Conclusions: Personalized HI-CHART radiation prescription based on normal tissue constraints is tolerable and initial results are promising.

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NSCLC: Primary tumor size - radiation dose related accelerated, twice daily radiotherapy by target splitting, preceded by 2 cycles of chemotherapy: First results of a prospective study

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