

90 The effect of hypofractionated accelerated radiotherapy on pulmonary function in non small cell lung cancer

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Purpose: Radiotherapy for non small cell lung cancer (nsclca) is known to affect pulmonary function. The aim was to prospectively determine the effect of high dose hypofractionated accelerated radiotherapy on pulmonary function tests, as a sensitive indicator of radiation induced pulmonary toxicity.

Methods and Materials: 51 patients (pts) with inoperable NSCLCA were treated with 72 Gy in 24 fractions at 3 Gy per fraction over 5 weeks. Mean age was 66 years with range of 46 to 82 years. Patients underwent pulmonary function testing (PFTs) pre and post irradiation. FEV1 (forced expiratory lung volume in 1 second), FVC (forced vital capacity) and DLCO (carbon monoxide diffusing capacity) were measured pre RT (within 3 months) and post RT (first measurement at 3 months) and then at 6 monthly intervals, using single breath technique. The median follow up was 5 months with a maximum of 61 months. Data for PFTs for 27 pts with adequate follow up were available for analysis.

Results: There was only a modest reduction in PFTs and this was statistically significant only for FEV1 ($p=0.011$). 21 of 27 pts (77%) had a reduction in FEV1 but 6 pts (23%) had an increase in FEV1. The mean reduction in FEV1 was 13.4% (range 0.4–26.7%), which is comparable to conventionally fractionated RT. The reduction in FEV1 was not predictable on basis of baseline characteristics, such as age, sex, smoking history, use of prior chemotherapy or baseline pre RT FEV1. Pearsons correlation was performed to assess the effect of V5, V10, V15, V20, V25, V30, and MLD on FEV1. (V5 = volume of lung receiving 5y). Those variables found to be statistically significantly associated with FEV1 were V5 ($p=0.014$), V15 ($p=0.033$), V20 ($p=0.027$), V25 ($p=0.017$), V30 ($p=0.011$). On multivariate regression analysis V30 was most significantly associated with a greater reduction in FEV1, (adjusted $r^2=0.256$, ANOVA = 0.011).

Conclusions: The effect of hypofractionated lung RT on pulmonary function is comparable to conventional fractionation. The reduction in FEV1 may be predicted by V30. The effect may be seen as early as 3 months post radiotherapy.