

post-implant D90 and EBRT dose using an alpha/beta ratio of 2. Pts were stratified into 3 BED groups: (1) <200 Gy (n = 645), (2) 200–220 Gy (n = 199), and (3) >220 Gy (n = 234). Freedom from biochemical failure (bFFF) was determined using the Phoenix definition, PSA nadir plus 2 ng/ml. Survival functions were calculated by the Kaplan Meier method with factors compared by log rank. The effect of multiple variables was tested by Cox regression.

Results: The median BED was 192 Gy (158–215; 25–75%ile). The 5-year bFFF for the entire cohort was 80%. bFFF for GS 7 and 8–10 by BED dose groups were 82.3%, 82.5% and 89.5% ($p = 0.094$), and 51.6%, 85.5% and 86% ($p < 0.0001$), respectively. For GS 8–10, bFFF improved from 68.7% to 92.5% when pts were analyzed by 2 dose groups, BED \leq 220 Gy vs. >220 Gy (OR 4.2, 95% CI 1.8–10, $p < 0.001$). bFFF for patients with a pretreatment PSA >20 (n = 119) by BED groups are shown in the table. For the entire cohort, Cox regression revealed GS, PSA, HT, EBRT and BED dose as significant ($p < 0.001$). The mean BED for the monotherapy pts was 155 Gy (25–75%ile 140–165) compared to 214 Gy (25–75%ile 195–232) for the EBRT/PBB pts ($p < 0.001$). 36.4% of the EBRT/PBB pts had a BED > 220 Gy vs. 2% of the monotherapy pts. Overall survival at 5 and 10 years for the 3 BED dose groups were 96.8%, 99.3%, 100% and 38.8%, 66.2%, 88.9%, respectively ($p = 0.05$).

Conclusions: These data suggest that PPB combined with supplemental EBRT and short term HT yields excellent bFFF and survival results when delivered BED doses are greater than 220 Gy. These doses can be achieved by a combination of 45 Gy EBRT with 120 Gy of Pd-103 or 130 Gy of I-125.

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151 Toxicity Analysis of RTOG 0236 Using Stereotactic Body Radiation Therapy to Treat Medically Inoperable Early Stage Lung Cancer Patients

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Purpose/Objective(s): The Radiation Therapy Oncology Group (RTOG) 0236 protocol utilized stereotactic body radiation therapy (SBRT) with ablative prescription dose to treat early stage non-small cell lung cancer patients (pts). A secondary endpoint of this study was to determine treatment related toxicity.

Materials/Methods: All pts were required to have documented severe co-morbid medical conditions precluding lobectomy. Pts with peripheral (greater than 2 cm from the central bronchial tree) T1–T3, N0, M0 tumors were eligible. The prescription dose was 20 Gy per fraction times 3 fractions (60 Gy total dose) assuming all water density. Subsequent analysis with proper tissue heterogeneity correction showed the actual dose to be only 54 Gy total. Early stopping rules required that the rate of treatment related grade 3 and higher toxicity be less than 25%. Rigorous central accreditation and quality assurance assessments were used to insure pts were treated according to protocol guidelines.

Results: The study opened May 2004 and closed October 2006 after accruing a total of 59 pts. Of 55 evaluable pts, 44 had T1 and 11 had T2 tumors. The majority of pts were female (62%) and had a Zubrod score = 1 (64%). Contouring and dose/volume compliance of 22 (40%) of the pts indicated the majority (91%) were treated per protocol or with only minor deviations. The criteria for early stopping due to toxicity was not met in each of 3 interim toxicity assessments. With median follow-up of 8.7 months, there was one (2%) grade 4 and 7 (13%) grade 3 pulmonary/upper respiratory adverse events reported as related to protocol treatment. Two of the 7 pts reported pulmonary function test decreased, 1 pt reported cough/dyspnea, 1 pt reported hypoxia, 1 pt reported pneumonitis, 1 pt reported cough/forced expiratory volume, and 1 pt reported pneumothorax. There was also a grade 3 dermatitis and a grade 3 syncope reported as related to protocol treatment. No treatment related deaths have been reported.

Conclusions: SBRT using an ablative total dose of 54 Gy in 3 fractions appears to be associated with acceptable treatment related morbidity in a population of frail pts with medically inoperable early stage non-small cell lung cancer with peripheral lesions. Further toxicity follow-up and assessment of the effect of pretreatment comorbidity is ongoing. Pts continue to be followed for the primary endpoint of 2-year local control.

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152 Stereotactic Body Radiotherapy (SBRT, BED \geq 100 Gy) for Operable Stage I Non-Small Cell Lung Cancer: Is SBRT Comparable to Surgery?

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Purpose/Objective(s): Stereotactic body radiotherapy (SBRT) has been aggressively performed as a radical treatment for stage I non-small cell lung cancer (NSCLC) in Japan, however most cases were medically inoperable. In a large Japanese multi-institutional experience, we reviewed the treatment outcome of SRT for medically operable stage I NSCLC cases with the patients' refusal to surgery.