Materials/Methods

Patients treated at our institution between 1996 and 2012 were included. Minimal GTV volume was 70 cc, which corresponds to a sphere of ca 5,1 cm. The lower limit of the total prescribed dose was 40 Gy to the periphery of PTV. Local control was calculated as time to local relapse. Cox regression univariate analyses were conducted to see which of the following factors affected time to local relapse; tumor size, localization, histology, as well as maximum, mean and minimal dose to the tumor in Gy BED. Dosimetric data were initially calculated as countinious variables, and thereafter in case of significance quartiles were calculated. When relevant, multiple other cut offs were tested with 1 Gy downward steps.

Results:

164 patients/tumors were treated between 1996 and 2012 at our institution. Histologies were 38 NCSCLC, 32 CRC and 29 RCC and 65 others. Median GTV volume was 142 cc (range 70 - 1966 cc). Median prescribed dose was 10Gyx4 (range 40-56 Gy given in 3-10 fractions corresponding to 71,4-112,5 Gy BED), generally at about 70%. 37 tumors we located within 2 cm of main or lobar bronchi.

Tumor size and localisation showed no statitical significant affect on local control. As shown in fig 1, there is a correlation between local control and histology (p<0,0001).

The only statistically significant dosimetric data in countinious analyzes was minimal dose (p=0,008). Skewness for minimal dose was 0,156 and the distribution was normal. Quartiles were used as cut offs and the 75h quartile (92 Gy) was statistically significant for time to local recurrence (fig 2). Thereafter we have calulated other cut offs with 1 Gy downwards and the last cutt off with statistical significance was 81Gy (fig 3).

Grade 3-5 toxicities were seen in 37 patients, with 23 cases om grade 3 maximum recorded toxicity, 4 cases of grade 4 and 10 cases of suspected grade 5 toxicity. The 37 patients with centrally located thoracic tumors accounted for 70% of grade 5 toxicity.

Conclusion:

SBRT for large tumors is a good treatment option in selected patients. Tumor histology and minimal dose are the only statistically significant factors for local control in univariate analyzes. Patients with centrally located thoracic tumors are heavily overrepresented among grade 5 toxicities.

Background:

SBRT is widely used for local ablation of primary NSCLC and metastatic lesions with less than 5 cm i diameter, with exellent local control and limited toxicity. For peripheral stage IA NSCLC local control rates exceed 90%. For NSCLC and CRC, there is a tendency to lower local control rates for lesions between 3 and 5 cm, compared to those smaller than 3 cm. Experience of SBRT for lesions bigger than 5 cm is still limited. In this retrospective study we investigate factors of importance for local control and toxicity post SBRT for tumors larger than 70 cc, of various histologies.

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