Survival and morbidity following stereotactic radiotherapy of hepatocellular carcinoma: a ten-year single institution experience.

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Introduction

Management of hepatocellular carcinoma (HCC) is based on a multidisciplinary approach where each patient is discussed in a tumour board at diagnosis and for local therapies. Choice of treatment is based on tumour size (TNM), presence of chronic liver disease and co-morbidity as well as the patient's general state. Stereotactic body radiotherapy (SBRT) is an emerging treatment option providing good local control rates. In Denmark, SBRT is used in patients ineligible for standard local therapies as resection, RFA and in some instances also after TACE.

Aim

This study reports on safety and efficacy of SBRT in a Danish cohort of patients with non-metastatic HCC.

Materials and Methods

This retrospective study included all patients treated with SBRT for HCC at Aarhus University Hospital between January 2009 and December 2018. The primary endpoint was local control and secondary endpoints were progression-free survival, overall survival and toxicity.

Data on patient characteristics were obtained from patient files and data on dosimetric parameters from the dose planning system. All patients were treated with IMRT. The prescribed clinical target volume (CTV) mean radiation dose ranged from 45 Gy to 68 Gy in 3-6 fractions, delivered with 2-3 fractions per week. The CTV and PTV were enclosed by the95% and 67% isodose surfaces, respectively. Constraints to organs at risk were based on local guidelines.

Follow up time (mean, range)	16 months (2-59)
Local control	
Local recurrence (number (%))	3 (11%)
Total recurrence (number (%))	20 (71%)
Mean time to recurrence (range)	8 months (0-43)
Death	
Number (%)	21 (75%)
Mean time to death (range)	19 months (12-26)
1 year survival	71%
3 years survival	32%
Toxicity	
None	15 (54%)
Nausea	3 (11%)
Pain	5 (18%)
Bleeding	2 (7%)
Decompensation	2 (7%)
Other	5 (18%)

Table 1: Data on local control, survival and toxicity

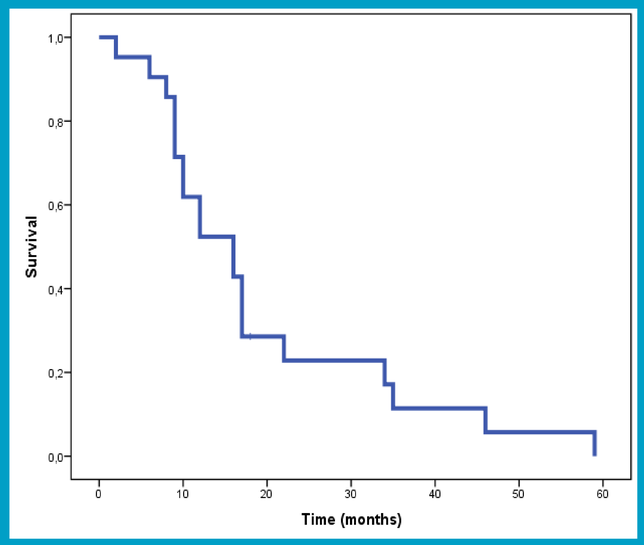

Figure 1: Overall survival from start of radiotherapy

Results

The study included 28 patients, with a mean age of 71 years (range 57-84); 82% were male. Most patients had a performance status of 0 or 1 (68%), a mean Child Pugh score of 6 (5-8) and 50% had a Charlson Co-morbidity Index score of >=3.

15 (54%) patients were diagnosed with cirrhosis. The median tumor size was 3.7 cm (range 1.4-6.8 cm) and 32 tumours were treated.

More than two thirds had received previous liver-directed treatments, primarily RFA and TACE with a median number of prior treatments of 3. Most patients (43%) were treated with 48 Gy in three fractions.

The median follow-up was 16 months. One-year local control and overall survival were 90% and 71 %, respectively. One-year progression-free survival was 39%; 65% of patients with disease progression received further HCC therapy. In univariate analysis, none of the examined factors predicted for recurrence nor overall survival. Toxicity was sparse and only 4 patients needed hospitalization for toxicity.

Conclusion

SBRT provides high local control to inoperable HCC patients. SBRT can be delivered safely even after previous liver-directed therapies and further liver therapies can follow treatment with SBRT. Despite excellent local control, disease progression outside of the irradiated site remains prominent. Further studies are warranted to examine combined therapy approaches to maximize disease control.

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