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Abstract

Clinical and Treatment Related Factors Affecting Outcome and Toxicity Of Stereotactic Body Radiotherapy in the Treatment Of Primary Liver Tumours and Oligometastatic Liver Disease

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Abstract

Objectives: To report outcomes and toxicities of a single-institution case series of stereotactic body radiotherapy (SBRT) in the treatment of unresectable hepatocellular carcinoma (HCC), intrahepatic cholangiocarcinoma (CC) and oligometastatic liver disease and to identify clinical and radiobiological factors affecting risk of hepatotoxicity.

Methods: Patients who received SBRT in our institution for primary hepatobiliary tumours (HCC or CC) or oligometastatic liver disease were included in this retrospective analysis. Primary outcome measure was CTCAEv4 Grade 3 or 4 toxicity and/or increase in the Child-Pugh (C-P) score by 2 or more points.

Secondary outcome measures included local progression, distant disease progression and death. Subjects, who did not progress, were censored at their last clinic appointment or the date of last follow-up scan. P values were calculated using non-parametric Wilcoxon test or Fisher's exact test for categorical variables.

Results: A total of 29 lesions in 23 patients were treated with SBRT between 2014 and 2016. Median age was 69 (range 34-90). 14 subjects were treated for primary liver malignancies (11 HCC and 3 CC) and 9 for metastatic disease (8 adenocarcinomas of colorectal origin, 1 metastatic anal squamous cell carcinoma). The median lesion size was 3.1cm (2-7.6). The majority of subjects were C-P category A (n=21); two were C-P category B. Median prescribed SBRT dose was 50Gy (45-60Gy) delivered in 5-10 fractions (median Biologically Effective Dose for tumour a/ß =10 (BED10) was 75; range 62.25-132). Median GTV volume was 103.7cc (8.2-374.5).Median follow-up was 8.8 months (2-32). 1-year overall survival was 66%; 1 -year disease free survival was 22%. 1-year local control rate was 97% with only 1 patient progressing within SBRT treatment field.Risk of disease progression was significantly higher in patients with extrahepatic disease at baseline (p=0.01). Risk of death was higher in patients with ECOG performance status >1 at baseline (p=0.02).There was a trend to improved disease free survival in subjects with a higher prescribed BED10 (median 101 vs 124Gy, p=0.07).5 patients (26%)

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experienced a =2 point increase in C-P score following treatment and CTCAEv4 grade 3 and 4 toxicity was recorded in 6 cases (30%).Higher baseline C-P score and multifocal disease at baseline (but not pre-existing cirrhosis, GTV volume, liver-PTV volume, VBED25 of liver and max liver dose) were predictive of decline in C-P score in univariate analysis (p=0.02 and p=0.01, respectively).

Conclusions: SBRT is an effective treatment option for primary hepatic malignancies and solitary metastases not amenable to surgical resection, achieving an excellent 1-year local control rate in our cohort. Liver SBRT appears to be a safe treatment option, however a quarter of our patients experienced a decline in C-P score following treatment. Patient selection, in particular in terms of pre-existing Child Pugh score, remains vital.