Three-Dimensional Choi Response Criteria in Patients with Advanced Renal Cell Carcinoma Treated with Molecular Targeted Therapies

Introduction and Objective: As molecular targeted therapies can induce tumor necrosis and minimal tumor shrinkage, the response evaluation criteria in solid tumors (RECIST) may not be optimal to evaluate antitumor activity. The utility of Choi criteria has been recently reported in patients with metastatic renal cell carcinoma (RCC). The purpose of this study was to measure the feasibility of 3D-Choi criteria and evaluate impact on survival for patients with advanced RCC using 3D-Choi criteria.
Materials and Methods: We evaluated the contrast CT images at two points, prior to the treatment and at the completion of one course with molecular targeted therapies. RECIST and Choi criteria evaluation using changes in the attenuation and the diameter of tumors was based on the original report. For the measurement of 3D-CT attenuation, we used semi-automated volume-of-interest analysis software.We evaluated Progression Free Survival (PFS) using the Kaplan-Meier method.
Results: A total of 35 patients with advanced RCC were evaluated in this study. Twenty patients were treated with sunitinib and 11 patients with sorafenib and 3 patients with everolimus and 1 patient with temsirolimus. We were able to measure the feasibility of 3D-Choi criteria in all cases. One case in CR, 3 cases in PR, 22 cases in SD and 9 cases in PD were evaluated according to RECIST, whereas one case is CR, 11 cases are PR, 12 cases are SD and 11 cases in PD were evaluated according to 3D Choi criteria. CR and the PR group which we evaluated by 3D Choi criteria reflected longer PFS than RECIST criteria (11.5 month vs 8.6 months, $p = 0.038$).
Conclusions: The 3D Choi evaluation may predict the prognosis of patients with the targeted treatment earlier. 3D-CT would provide helpful information for clinical decision-making.