Purpose: To investigate the dosmetric difference in the application of RapidArc using 6MV X-ray and 15MV X-ray for radiotherapy of multiple hepatic malignancy.

Methods: 12 cases with multiple hepatic tumors (primary 5 cases or secondary 7 cases) were selected. All patients underwent the three dimensional CT simulation in free breathing. For each patient, RapidArc plans with single or two 358° arcs using 6MV X-ray or 15MVX-ray were designed respectively, the prescription dose was 2Gy/Fractionx25 Fractions. The dosimetric differences were compared among RapidArc plans.

Results: All of RapidArc plans can meet the clinical requirement. There were no significant difference were found in the conformity index (CI), homogeneity index (HI), the maximum dose and the minimum dose of PTV among RapidArc plans (P>0.05), and all the CI can get to 0.91 and HI can get to 0.88. In the RapidArc plans with two 358° arcs, the V5, V10, V15 of normal liver were higher than with single arc, while V20, V25, V30, V35, V40 were lower than with single arc. The radiation dose of normal liver, stomach, duodenum and spinal cord differed no significantly among different plans (P>0.05). The monitor units of RapidArc plans using 6MV X-ray increased 12% compared to 15MV averagely.

Conclusions: The 6MV X-ray would be selected chiefly in the radiotherapy of multiple hepatic tumor using RapidArc with single or two whole arcs.