AbstractID:9647 Title :Dosimetric verification of RapidArc treatment delivery using the Delta4 phantom

Purpose: Recently, Varian Medical Systems ha ve introduced a new treatment technique, in which dose is delivered over one gantry rotation with variable MLC positions, dose rate and gantry speed, RapidArc . A preclinical RapidArc installation was carried out on a Varian Clinac at our institution. W ere port dosimetric verification of reproducibility and consistency of RapidArc delivery using the Delta4 phantom (Scandidos, SE). **Methods and materials:** 9 treatment plans generated in the Eclipse preclinical version of the RapidArc optimizer (H&N, prostate and lung) were delivered using a Clinac equipped with Radi d Arc delivery capa bility. The delivered dose was measured using the Scandidos Delta4 phantom. The measured dose distributions we re compared with doses calcu lated in Eclipse. All plans were delivered three times consecutively, and the first run was used as reference for constancy checks. The temporal resolution of the delivery was analysed by investigating the arc segments betwe en control points s eparately (17 7 control points per rotation). Gamma analysis (3%/3mm DTA) was used to quantify correspondence between dose distri butions. **Results:** O verall, good agreement was observed betwe en measured and calculated doses, gene rally with gamma values< 1 in >95% of measur ed points. Comparison of the acc umulated dos es for two consecutive runs of a plan showe d gamma va lues< 1 in all m easured points. The segment -by-segment analy siss howed discrepancies bet ween two c onsecutive runs ,with> 90% g amma values<1 in around 50 - 60% o ft he seg ments (gamm a dose crite rium 3%; <1-2mGy for single segments). Segments with large dose deviations werety pically counter -balanced by following segments w ith large devia tions of the opposite sign. The s egment disc repancies cancelled out in the acc umulated dose. **Con clusion:** The delive ry of RapidArc b eam delivery corresponded well with ca lculated dose dis tributions for differe nt cas es. The del ivery was reproducible, and wa sc arried out with highstabilit yof thea cceleratorperformance. Research spon sored by Va rian Me dicalSy stems,Inc.