

**Purpose:**

To compare and evaluate the performance of Varian RapidArc and Elekta VMAT for different treatment sites.

**Methods and Materials:**

Ten patients were selected for the planning comparison study. All plans were done for RapidArc using Eclipse and Elekta VMAT with Monaco treatment planning system. Plans were evaluated based on the ability to meet the dose volume histogram, dose homogeneity index, radiation conformity index, treatment planning time, estimated radiation delivery time, integral dose and monitoring unit needed to deliver the prescribed dose.

**Results:**

RapidArc plans achieved the best conformity ( $CI_{95\%} = 1.08 \pm 0.07$ ) while Elekta VMAT plans was slightly inferior ( $CI_{95\%} = 1.10 \pm 0.05$ ). The in-homogeneity in the PTV was highest for Elekta VMAT with HI equal to  $0.12 \pm 0.02$  Gy when compared to RapidArc with  $0.08 \pm 0.03$ . Elekta VMAT shows a reduction in the healthy tissue mean dose ( $6.92 \pm 2.90$ ) Gy when compared to RapidArc ( $7.83 \pm 3.31$ ) Gy. The integral dose is inferior with Elekta VMAT ( $11.50 \pm 6.49$ )  $\times 10^4$  Gy  $\text{cm}^3$  when compared to RapidArc ( $13.11 \pm 7.52$ )  $\times 10^4$  Gy  $\text{cm}^3$ . Gamma analysis result shows good agreement with the planned and delivered fluence for 3 mm DTA, 3% DD for all the evaluated points inside the PTV, for both the techniques.

**Conclusions:**

RapidArc presents slightly improvement in the OAR sparing with better target coverage when compared to Elekta VMAT. Trivial differences were noted in all the plans for organ at risk but the two techniques provided satisfactory conformal avoidance and conformation.