

Abstract

Intensity Modulated Radiation Therapy (IMRT) helps; dose intensification, improve target coverage, and reduction in the radiation dose to organs at risk (OARs). Whereas, RapidArc (RA) radiotherapy delivers precise dose with a rotation of 360° in a single or multi-arc treatment of gantry for the patients with cervical carcinoma. In this study, we compare dosimetric parameters for IMRT and RA while treating the patients suffering from cervical carcinoma. A total 20 numbers of patients, out of which, 10 were treated with IMRT and the other 10 with RA. As per Radiation Therapy Oncology Group (RTOG), on CT images for Gross Target Volume (GTV), Clinical Target Volume (CTV) and Planning Target Volume (PTV) contouring were done by an oncologist and OARs were also marked out. The dosimetric parameters include conformity index, new conformity index, Paddick conformity index, homogeneity index, radical dose homogeneity index, moderate dose homogeneity index, uniformity index, gradient index and, coverage, were calculated for the evaluation of plans and doses for OARs. Two sample paired t-tests have been performed to contrast the dosimetric dissimilarities between IMRT and RA plans. In the planning of IMRT and RA, the calculated mean values for conformity index is 0.96. For new conformity index and for Paddick conformity index, the mean value is 1.06 and 0.93 for both techniques respectively. Similarly, the calculated mean value of homogeneity index for IMRT is 0.15 and for RA 0.14. Whereas, the mean value of radical dose homogeneity index is 0.68 for IMRT and 0.66 for RA. The moderate dose homogeneity index for IMRT is 0.90 and for RA it is 0.91. In addition, the uniformity index has the mean value of 1.11 and 1.09 for IMRT and RA respectively. The gradient index has the value 1.03 for both techniques. IMRT has a value of coverage which is 0.81 and RA has value 0.83. Calculations also revealed that the dose is lesser for OARs in case of RA as compared with IMRT, except for small bowl. It is observed that RA may reduce the treatment time over IMRT although OARs sparing and PTV coverage is the same. Throughout RA treatments, there will be lesser possibility of patient movement. The vital distinction between IMRT and the RA is the capability to adjust the beam control.