

AbstractID: 10628 Title: Integral dose variation in three-dimensional conformal radiotherapy, intensity-modulated radiotherapy, and helical tomotherapy

**Purpose:** To evaluate the integral doses (IDs) to organs at risk (OARs), normal tissue (NT) and the whole body in three-dimensional conformal radiotherapy (3DCRT), intensity-modulated radiotherapy (IMRT) and helical tomotherapy (HT) for whole pelvic radiotherapy (WPRT) in postoperative endometrial cancer patients. **Method and Materials:** We selected ten patients with endometrial cancer undergoing postoperative WPRT. Plans of 3DCRT using both 6-MV (6MV-3DCRT) and 18-MV (18MV-3DCRT), static IMRT using a conventional linac with 6-MV (6MV-IMRT) and 18-MV (18MV-IMRT), and HT using 6-MV were developed for each patient. The IDs to OARs, NT and the whole body were compared. **Results:** Compared with 3DCRT, both IMRT and HT significantly improved dose conformity and the IDs to OARs (8.8% - 29.9%,  $p < 0.05$ ). Compared with 6MV-3DCRT, IMRT resulted in 13.2% and 11.0% lower IDs to NT and the whole body ( $p=0.00$ ), whereas no significant difference was found in HT plans. Compared directly with IMRT, HT reduced the IDs to rectum and bladder ( $p<0.05$ ), whereas the IDs to NT were 13.9% higher than with 6MV-IMRT ( $p=0.00$ ), the IDs to pelvic bones also slightly increased with HT ( $p<0.05$ ). The use of 18MV reduced the IDs to NT 5.8% and 2.7%, to the whole body 4.8% and 2.1% in the 3DCRT and IMRT plans ( $p=0.00$ ). **Conclusions:** In postoperative WPRT of endometrial cancer, IMRT and HT result in better conformity and lower IDs to OARs compared with 3DCRT. The IDs to NT and the whole body were significantly lower with IMRT, whereas no significant difference was found with HT compared with 6MV-3DCRT. Compared directly with IMRT, HT further reduced the IDs to rectum

AbstractID: 10628 Title: Integral dose variation in three-dimensional conformal radiotherapy, intensity-modulated radiotherapy, and helical tomotherapy

and bladder, at the expense of a slightly higher ID to pelvic bones and NT. The use of

18 MV improved the IDs to NT and the whole body in both 3DCRT and IMRT.