

AbstractID: 6680 Title: Quantitative comparison of critical organs dose in the treatment of endometrial cancer using HDR with full 3D planning vs 2D pre-planned template isodose lines

Purpose: To demonstrate more accurate dose calculation to the critical organs in the treatment of endometrial cancer using a vaginal cylinder applicator and HDR with 3D planning.

Method and Materials: The PLATO HDR (version 14.3) planning system was used to accurately calculate the dose to bladder and rectum. We tracked 100 treatment fractions from 20 patients. After each fraction CT-simulation, a new treatment plan was generated based on the current CT images. The oncologist determined the bladder and rectum. The fractional doses to the bladder and rectum were calculated from the 3D planning. The total doses to the bladder and rectum were accumulated from each individual fractional dose.

Results: The HDR treatment of endometrial cancer using cylinder applicator is commonly planned using standard preset templates or generate a template based on the first 3D treatment. Subsequent treatments would have the Bladder and rectal doses assumed to be same as the first fraction. Compared with this preset template planning method, the accumulated dose to the bladder and rectum from 3D planning is significant difference. For a five fraction vaginal cylinder HDR treatment, the root mean square (RMS) of variance of these two methods were $21.9\% \pm 16.1\%$ for the bladder dose, and $18.1\% \pm 12.6\%$ for the rectum dose.

Conclusion: In endometrial cancer treatment using HDR, the 3D HDR planning can give more accurate dose calculation to critical organs than the preset template planning method.