Endometrial Cancer

• About 63,230 new cases will be diagnosed while about 11,350 women will die from cancers of the uterine body in US.¹
• Endometrial cancer is the fourth most prevalent cancer in the United States.²
• Dose constraints to organs at risk (OAR) required by American Brachytherapy Society (ABS) are:¹

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Clinical Case Selection

• 30 patients’ data with endometrial cancer (all stages) were selected
• An HDR remote afterloader V3 from Elekta/Nucletron with Iridium-192 source (active length 3.5 mm) had been used.
• Dose fractionation regimens varied from 4 Gy to 7 Gy, 1 or 2 fractions per week.
• Multichannel cylinder applicator had been used.
• All critical organs had been reconstructed with a portion of the inserted cylinder’s surface as CTV or PTV.

MATERIALS & METHODS

• All 118 CT sets were exported from Oncentra and imported into Eclipse with their plan’s structures and doses.
• For each patient, the first set of CT images, of the first fraction, was registered with the subsequent treatment plans’ CT sets using Varian’s automatic matching and manual rigid registration tools.
• After the registration, all the structures from each treatment fraction were copied into the initial CT scan, and the normalization percentage to the specific fraction was applied.
• Vaginal applicators were used for all the patients.

RESULTS

• The cylinder inter-fractionation placement variances histograms were plotted in Figure 4.
• Translation was calculated and found zero for all implanted cylinders.

CONCLUSION

• We evaluated the cylinder position for each fraction compared to the initial plan based on a 3D point-cloud rigid registration.
• We conclude that there are no significant rotation and translation variations to be found in the evaluation of the cylinder position in the coordinate system for the initial fraction compared to the subsequent fractions.
• However, immobilization devices need improvement in order to minimize any cylinder displacement and also to prevent any displacement during transportation and treatment delivery.

FUTURE WORK

• It would be useful to research any correlations between the dose differences and the applicator placement.

REFERENCES

5. TG 43-AAPM report.

Acknowledgements

• Physics Department, Florida Atlantic University.
• 21st Century Oncology.
• Advanced Radiation Physics Inc.