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## **Reproducibility and genital sparing with a vaginal dilator used for female anal cancer patients.**

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### **ABSTRACT**

**PURPOSE:** Acute vulvitis, acute urethritis, and permanent sexual dysfunction are common among patients treated with chemoradiation for squamous cell carcinoma of the anal canal. Avoidance of the genitalia may reduce sexual dysfunction. A vaginal dilator may help delineate and displace the vulva and lower vagina away from the primary tumor. The goal of this study was to evaluate the positional reproducibility and vaginal sparing with the use of a vaginal dilator.

**MATERIALS AND METHODS:** Ten female patients treated with IMRT for anal cancer were included in this study. A silicone vaginal dilator measuring 29 mm in diameter and 114 mm in length was inserted into the vagina before simulation and each treatment. The reproducibility of dilator placement was investigated with antero-posterior and lateral images acquired daily. Weekly cone beam CT (CBCT) imaging was used to confirm coverage of the GTV, which was typically posterior and inferior to the dilator apex. Finally, a planning study was performed to compare the vaginal doses for these 10 patients to a comparable group of 10 female patients who were treated for anal cancer with IMRT without vaginal dilators.

**RESULTS:** The absolute values of the location of the dilator apex were  $7.0 \pm 7.8$ mm in the supero-inferior direction,  $7.5 \pm 5.5$  mm in the antero-posterior, and  $3.8 \pm 3.1$ mm in the lateral direction. Coverage of the GTV and CTV was confirmed from CBCT images. The mean dose to the vagina was lower by 5.5 Gy, on average, for the vaginal dilator patients, compared to patients treated without vaginal dilators.

**CONCLUSION:** The vaginal dilator tended to be inserted more inferiorly during treatment than during simulation. For these ten patients, this did not compromise tumor coverage. Combined with IMRT treatment planning, use of a vaginal dilator could allow for maximum sparing of female genitalia for patients undergoing radiation therapy for anal cancer.

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