AbstractID: 9169 Title: Film based treatment plan validation for a new vaginal applicator using the Xoft Axxent™ 50 kVp miniature X-ray source

Purpose: Compare delivered to planned dose for the Xoft Axxent™ vaginal applicator and 50 kVp x-ray source using radiochromic film.

Method and Materials: A 25mm diameter vaginal applicator (FDA clearance pending) was used to deliver a simulated treatment in a water phantom. The treatment was planned with Varian BrachyVision™, using the Xoft 50 kVp source TG-43 parameters. The prescription dose was 7 Gy at 5mm from the applicator surface. The applicator and a 5" square of GAFChromic EBT film were held in a Solid Water™ frame in a water phantom. The film plane was parallel to the long axis. The exposed film was scanned and processed to create a calibrated dose profile. The BrachyVision isodose-line plot was transformed into an image with identical size and pixel density to the film then combined with the film image to create a new image with dose exposure values only along the planned isodose contours. These contours were analyzed to determine the variation in actual delivered dose along them.

Results: Visual comparison of isodose contours and film image showed qualitatively good agreement of the delivered treatment with the plan. Further image processing quantified the agreement. An ad hoc film calibration was employed to estimate dose values along planned isodose contours, with emphasis on the prescription dose of 7 Gy. Thus absolute dose values averaged along a given contour were only approximately correct but the more germane variation of dose along each contour was found to be less than 8% (2 sigma) for dose contours from 1.75 to 8.75 Gy.

Conclusion: Dose measured by film exposure in a plane parallel to the applicator axis was found to be constant along plan isodose contours with SD less than 8% (2 sigma).

Conflict of Interest: Research supported by Xoft, Inc.