AbstractID: 11512 Title: Dosimetric Study of a New Surface Applicator for the Xoft Axxent System

Purpose:

To determine the dosimetric properties of a new surface applicator designed for the Xoft 50 kVp x-ray system

Method and Materials:

A 35mm conical stainless steel applicator with Al flattening filter interfaces to the Xoft 50 kVp x-ray source to provide therapeutic radiation to surfaces such as skin. Measurements of the dose profile at the surface and at depths to 20 mm were performed using a PTW ionization chamber in a water phantom. The chamber was controlled by a stepper motor and linear stage, and data was read into a controlling computer. In addition, film data was taken both parallel and perpendicular to the surface.

Results:

Nominal dose profiles and depth dose characteristics were determined from an average of ten sources. Dose profiles across at least 80% of the applicator width were flat to within \pm 10% for all sources, and to within 5% on average. Depth dose characteristics are very similar to those published for HDR based surface applicators, with the percent depth dose at 5 and 10 mm at 58% and 36%. Such data can be used for treatment planning purposes. The variation seen among sources determines an error band representative of what will be experienced in clinical use.

Conclusion:

The FDA approved surface applicator delivers a dose profile that is flat to within $\pm 10\%$ over a span of 80% of the defined width of the device. It can be used for treatment of skin lesions in lightly shielded rooms due to the low energies employed. There are also intriguing possibilities for use intra-operatively, since the system can be used in an operating room.

Conflict of Interest (only if applicable):

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