

AbstractID: 8758 Title: Dosimetry of an x-ray endocavitary proctoscope adapted for use with the Axxent<sup>®</sup> Electronic Brachytherapy System

**Purpose:** To analyze the dose rate and uniformity at the aperture of an Electro-Surgical Instrument (ESI) Proctoscope when used with an Axxent<sup>®</sup> Model S700 X-ray Source. **Materials and Methods:** The ESI proctoscope was originally designed for use with a Philips RT-50 x-ray contact therapy unit. Because these units are no longer supported, an alternative x-ray source is being sought which allows for duplication of the Papillon technique for treating anal-rectal lesions. A source holder was fabricated to position the Axxent model S700 X-ray Source collinearly on axis within a lead-lined proctoscope possessing a 24 mm inner diameter aperture. This mechanism allows the distance from the proctoscope aperture to the source to be adjusted from 1 to 10 cm and allows a filter to be placed at the distal end of the source to harden the beam and/or flatten the dose distribution. The dose rate was measured at the proctoscope aperture using a PTW 34013 Soft X-ray Chamber set into the surface of a Gammex RMI 457 solid water phantom. GAFChromic EBT radiochromic film was used for profile measurements. **Results:** For operation at 50 kVp and 0.30 mA beam current with a 0.5 mm thick Al filter and source-to-aperture distance of 3.4 cm, the dose rate was 1.1 Gy per minute. Profile evaluation indicated a dose uniformity of 5%, 8% and 15% across 80%, 93% and 98% of the aperture diameter, respectively, without use of a flattening filter. **Conclusions:** Measurements of dose rate and uniformity at the aperture of a 24 mm diameter ESI proctoscope indicate that the Axxent S700 x-ray source may be a suitable alternative to the Philips RT-50 Endocavitary Unit for treatment of anal-rectal lesions. **Conflict of interest:** Research sponsored by Xoft, Inc.