AbstractID: 1125 Title: In Vivo TLD Dosimetry for a High Dose Rate (HDR) Breast Brachytherapy Using MammoSite® applicator

The purpose of the study is to determine the dose to skin, thyroid, and outer canthus of eye of patients who underwent high dose rate breast brachytherapy with mammosite® applicator using TLD dosimeters.

Between June 2002 and January 2004, 39 patients with early stage breast cancer (15 with left breast cancer) underwent lumpectomy followed by high dose rate brachytherpy using mammosite® applicator (Proxima Therapeutics, Inc.) at University of Pittsburgh Cancer Institute. This device utilizes a single dwell source positioned at geometric center of the balloon. Each patient was planned with the Nucletron® plato bps V14.2 and treated with Nucletron® V2 afterloader. The radiation prescription was set as in the RTOG-95-17 study, delivering 340cGy per fraction at the depth 1 cm into the lumpectomy margin using BID fractions to 34Gy.

The skin, thyroid, and outer canthus of eye doses were measured using thermoluminescent dosimeters (TLDs). The TLDs were left on the patient during a single fraction in the AM and PM of the day and then read after 24 hours using the Harshaw model 5500 TLD reader (Thermo Electron Corporation, Santa Fe, New Mexico). The TLD readings were averaged. Using SPSS software, a descriptive statistical and correlation analysis were done.

As a percentage of the prescribed dose to the primary breast, the mean skin, thyroid, and outer canthus of eye doses were 57.55%(SD=21.4), 2.17%(SD=0.99), and1.34%(SD=0.57). There was no significant correlation between the diameter of the balloon and the doses to the thyroid skin, thyroid, and outer canthus of eye were found.