

AbstractID: 1655 Title: Post prostate implant urethral dose measurement with micro MOSFET.

Permanent prostate seed implant has become a standard treatment option for patients with localized prostate cancer. Urethral complication is believed to correlate with dose received. Sparing of the urethra is usually achieved by peripherally weighted loading of seeds to keep the urethral dose under a set value (125% in our institute). We have investigated online urethral dose measurements using micro MOSFET. MOSFET dosimeters have been widely studied as a tool for patient dose verification. The major advantage of this dosimeter is its ease of use and small size, closely approximating a point detector.

Standard micro MOSFETs from Thomson and Neilson, Ottawa, Canada was used for these measurements. The MOSFET calibration was performed using specially designed phantom, where 6 seeds are loaded radially at 1 cm from the MOSFET sensor. The seeds were calibrated using well type ionization chamber and the dose rate at MOSFET sensor was calculated. The directional dependence of MOSFET was within $\pm 2\%$ for this energy. MOSFET was placed in 6 french LUMENCATH and positioned at the level of centre of prostate within the urethra guided under fluro. The MOSFET response in mV was measured for integrated time of 13 mins. This was then converted to dose based on I125 calibration obtained above. Our preliminary measurements showed that urethral dose of 7.3cGy/hr compared well with the expected dose 8.5 cGy/hr. The results showed that the micro MOSFET dosimeter could be used to perform in-vivo patient dosimetry for post implant prostate brachy therapy.