

AbstractID: 7104 Title: Radioprotective effect of the bolus on testicular dose following radiation therapy

Purpose: To estimate the radioprotective effect of the bolus on testicular radiation dose following radiation therapy for testicular seminoma.

Methods and Materials: Testicular dose measurements were performed with thermoluminescent dosimeters (TLDs) between three and seven times on two patients and anthropomorphic phantom. All treatments were taken with L-shaped fields administered as two parallel-opposed AP and PA equally weighted fields of 15 MV X-rays. One fraction of 180 cGy was delivered to the same isocenter with 120 multi-leaf collimations from a Varian 21EX linear accelerator. In two patients, a round testicle shield device was used to protect the testes during treatment period. To reduce an additional testicular dose, we inserted the bolus (0.5, 1 cm thickness) in the shield device. In phantom, the comparison measurement was performed with and without the shield device added the bolus.

Results: The testicular dose ranged from <1 cGy to 6 cGy (range 0.6-3.3%, mean 1.1% of the prescribed dose at the reference point). With only the shield device, the measured dose to the testicles ranged from 1.9-3.2c Gy (mean 2.2 cGy). The absorbed dose was reduced to 1%-2% of the prescribed dose relative to that of without the shield device. Mean testicular dose of the shield device added the bolus was 1.1 cGy (range 0.8-1.4). By using the bolus of 0.5 and 1 cm thickness, 10%-50% of the absorbed dose to testicle decreased. This was due to the reduction of scattered testicular radiation dose by the bolus in shield device.

Conclusion: This study observed the shielding benefit of the bolus on testicular dose during radiation treatment with 15 MV X-rays. Decreasing the undesired irradiation on testicle by using the bolus should be pursued in an effort to reduce the genetic risk.