

AbstractID: 8631 Title: In-vivo skin dosimetry with EBT radiochromic films in Helical Tomotherapy treatments

Purpose

To evaluate feasibility and accuracy of skin dose measurements in helical tomotherapy treatments with EBT radiochromic films (ISP, Wayne, NJ).

Materials and methods

EBT films were cut into pieces and irradiated for calibration with a static Tomotherapy field at 1cm depth of a solid water phantom. Calibration doses, ranging from 25 to 1200 cGy, were calculated from thimble ionisation chamber measurements at 1.5cm depth and PDD data.

We taped small cuts (1 cm²) of EBT films on the inner side of masks used for patients immobilization. Films were removed from mask after 1-3 sessions of tomotherapy treatment performed with HI-ART Tomotherapy System (Tomotherapy Incorporated, Madison, WI). EBT films were read with an Epson 1680 Scanner using only the central 10x15cm² scanner region for better homogeneity. Calibration curve and conversion to dose for EBT scans were made following Devic et al¹.

We tested the method on four patients treated for cranial and head and neck diseases with tomotherapy. To check measurement accuracy, we compared film doses with dose calculated by the treatment planning software on patient surface.

Results

Measured and calculated doses on patient surface show an average difference, calculated on the four patients, of 3.54% and a mean standard deviation of 2.99%.

Conclusions

A simple, non-invasive method to measure patient skin dose in helical tomotherapy treatments has been implemented. Preliminary results of measurements on three cranial patients show a good agreement with surface dose calculated by the treatment planning system. Further data need to be collected to confirm accuracy of measurements.

Bibliography

¹ Devic S, Seuntjens, Sham E et al. Precise radiochromic film dosimetry using a flat-bed document scanner. Med. Phys 32, 2245-2253 (2005).