

AbstractID: 1083 Title: ASSESSMENT OF THE ACCURACY IN OPHTHALMIC RADIOSURGERY WITH THE LEKSELL GAMMA KNIFE

Objective: Assessment of the accuracy in ophthalmic radiosurgery: stability and reliability of eye fixation, accuracy of stereotactic imaging, absolute and relative dosimetry.

Method and Materials: Stability and reliability of eye fixation was checked by two subsequent MRIs performed in at least two hours interval. Comparison between MRI done in prone and supine patient position was done as well. Special water filled head phantom was used for assessment of eye lesion absolute and relative dosimetry inaccuracy. Polymer-gel dosimeter evaluated by nuclear magnetic resonance and small ion chamber, semiconductor detector and thermoluminescent dosimeter were used to assess the accuracy of relative and absolute dosimetry, respectively.

Results: Typical image distortion for selected MRI sequence was not higher than 1.0 mm (mean value 0.5 mm). Eye volume deviations observed between two subsequent MRIs done in at least in two hours interval as well as for MRIs done in prone and supine patient position were typically within 0.5 mm. A comparison of calculated dose profiles from the treatment planning system and those measured by the polymer-gel dosimeter in all three axes demonstrated a very good geometric agreement with mean deviation in profile position of 0.5 mm. Typical deviations between measured and calculated absolute dose were within 5 %.

Conclusions: Observed geometrical accuracy in MRI target imaging showed a good quality of the performed procedure. Comparison of calculated and measured profiles showed good agreement in relative dosimetry. Some deviations in absolute dose are probably caused by location of eye lesions in very close surface position.