

**AbstractID: 1247 Title: A dosimetric Comparison of stereotactic Radiosurgery Treatment Modalities: Gamma Knife versus adapted LINAC**

**Purpose:** To compare and evaluate clinically applied treatment plans for Gamma Knife (GK) and adapted LINAC using non-coplanar fixed fields shaped by micromultileaf collimators.

**Materials and Methods:** Treatment plans for 5 acoustic neurinomas, 5 meningiomas, 5 AVMs and 5 pituitary adenomas were selected. An inhouse developed software package was used to convert CT data, target volume and volumes of interest (VOIs) between GK and LINAC (Leibinger) TPS file format. An electronic patient data exchange was performed and common planning objectives were defined. Calculated 3D dose distributions were exported from both TPS. Plan assessments based on physical dose distributions were carried out qualitatively and quantitatively for the target volume, VOIs and the total skull volume using the developed comparative package. Dose statistics, dose-volume histograms (DVHs), target coverage (TC) and conformity index (CI) were compared. For non-target isodose distributions three characteristic ranges were considered: <3%, 3%-15% and 15%-50%.

**Results and Conclusions:** For both modalities a high degree of TC and CI is achievable. For these parameters no significant statistical differences and no correlations with size, shape and location were observed. Due to the different percentage prescription isodose (50% in case of GK and 80% in case of LINAC), significant differences were found for the maximum and mean dose values (+25.7% for the GK) within the target. These should be evaluated in randomised clinical studies. Differences in DVHs for various VOIs were found. The differences found at low dose levels show a characteristic behaviour and depend on the target location and target volume.