AbstractID: 4765 Title: A stereotactic system with a non-stereotactic component: a new perspective

Purpose: A non-stereotactic component has been incorporated in the XKnifeRT (Radionics) stereotactic system. This allows the circular cones/arcs to be used for cranial applications without the actual stereotactic frames but retaining the advantage of conformal distributions. Extracranial applications include an initial 3D non-stereotactic followed by a stereotactic boost, all in one system thereby allowing a composite dose distribution to be viewed.

Method and Materials: A 79 year old male with recurrence of a prolactin-secreting pituitary adenoma was fitted with a mask and marked with three fiducials so that these appeared in the CT scan (2 mm slices). This non-stereotactic CT scan was transferred to the XKnife RT treatment planning system and the "non-stereotactic" localizer selected. The CT slice that shows the external markers was brought in the field of view and the non-stereotactic axes positioned so that the horizontal axis passes through the left/right markers and the vertical axis passes through the anterior. This provided the origin for the system and the treatment plan was accomplished using a 4 cm cone and 5 arcs. The prescription was set at 5040 cGy in 28 fractions.

At the linac, the patient was set up using the three markers on the mask rather than the usual stereotactic hardware. Frequent orthogonal portal images were acquired to ensure good patient reproducibility.

Results: The dose distribution obtained by utilizing circular cones and arcs is clearly far superior and allows for sparing of the normal brain when compared to static 3D fields. However, the patient day to day reproducibility is, as expected, considerably inferior when compared to the stereotactic frames. However, this combination proved very beneficial in this situation where the patient could not be fitted into the stereotactic frame.

Conclusions: The non-SRT component in XKnifeRT provides considerable flexibility in using the stereotactic technology itself.