Contribution ID: **177**   Type: **Oral report**

Cone beam computed tomography research on Leksell Gamma Knife Icon.

Friday, 24 September 2021 15:45 (25 minutes)

The new model of the Leksell Gamma Knife Icon (LOL Icon) is equipped with additional features for fractionated radiation with masked fixation of the patient's head, namely, a cone-beam computed tomography (CBCT). LGK Icon allows to perform CBCT for frame-based radiosurgical treatment as well. This is not a mandatory stage, but it can be an alternative method of defining stereotactic space and could be used as an independent check of the patient's positioning before radiosurgery.

The purpose of this work was to assess differences between frame-based and Cone Beam Computed Tomography (CBCT) defined stereotactic space and to identify predictors of the observed findings.

Differences between frame-based and CBCT-defined stereotactic space after image coregistration were reviewed for 529 patients. Treatment planning system reported the information about the shifts in XYZ coordinates of the center of the stereotactic space (ie, coordinate x = 100 mm, y = 100 mm, z = 100 mm) defined by the frame, and the maximum shot displacement (MSD) in mm. We collected the potential predictors of the differences. 19 factors were investigated. We used multiple linear regression to evaluate associations with the increased differences.

Rotational and translational shifts greater than 1 degree and 1 mm, respectively, were observed in 2.6% of patients. At the same time, a decrease in tumor coverage of more than 5% was detected in 8.3% of cases. It was revealed that the higher fiducial errors (both mean and maximum), greater weight of the patient, lower Karnofsky Performance Scale (KPS) were predictors of increased rotational, translational shifts and the MSD.

Primary author: Mrs BANNIKOVA, Irina (MSU)

Co-authors: Mrs CHERNYAEV, Aleksandr; Mrs DALECHINA, Aleksandra

Presenter: Mrs BANNIKOVA, Irina (MSU)

Session Classification: Section 8. Nuclear medicine

Track Classification: Section 8. Nuclear medicine.