

Intra-fraction Imaging for Cranial SRS, initial experience to chart way forward

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Purpose

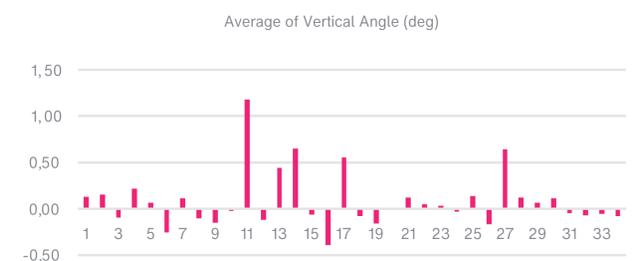
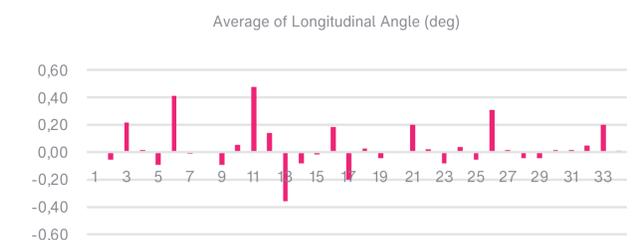
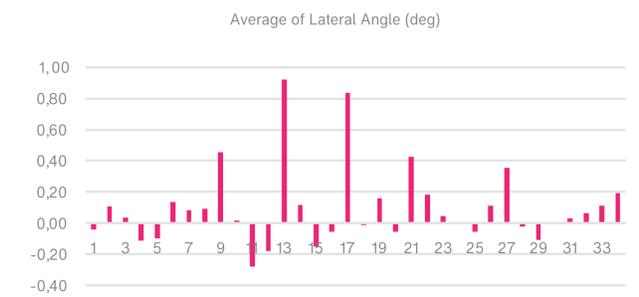
The aim of the study was to investigate the intra-fractional motion using the ExacTrac (Brainlab, Germany) system in TrueBeam (Varian Medical Systems, USA) Linac based Radiosurgery (SRS).

Materials and Methods

A retrospective analysis of 34 Cranial SRS patients imaged using ExacTrac floor mounted twin x-ray tubes and corresponding image receptors given single fraction treatment was done. Each patient was positioned using PerfectPitch 6D couch which was guided by reflective markers. Patients were immobilized in Thermoplastic Masks supplied by Brainlab which has rigid immobilization features. Xray verifications from Tube1 and Tube 2 was done for initial setup followed by KV CBCT imaging for verification. Once initial shifts were applied subsequent shifts were obtained from intrafraction imaging done by BrainLab system. If the snap verification were beyond acceptable limits of 0.5mm and 0.5° (based on initial experience of Novalis users at sister facility) the shifts were applied, otherwise treatment was continued without correction.

Results

Results were computed from the (.csv) file exported from Brainlab Workstation. The average translation shifts in mm were: Lateral -0.08 (Range -0.72 to 0.8), Longitudinal -0.10 (Range -0.75 to 0.25) and Vertical -0.26 (Range -1.44 to 0.09). The average rotation shifts in deg were: Lateral Angle 0.10° (Range -0.28° to 0.92°), Longitudinal Angle 0.04° (Range -0.36° to 0.48°) and Vertical Angle 0.08° (Range -0.39° to 1.18°).



Conclusion

The study correlates that margins defined and put in practice are well within reach subject to intra-fraction imaging is practiced diligently. The frequency of intra-fraction imaging could be rationalized to reduce treatment time and patient imaging dose.