

ABSTRACTID: 9572 TITLE: VERIFICATION OF SOURCE AND COLLIMATOR CONFIGURATION FOR GAMMA-KNIFE<sup>®</sup> PERFEXION<sup>™</sup> USING PANORAMIC IMAGING

**Purpose:** To develop a method of verifying the source and collimator configuration of Leksell Gamma Knife<sup>®</sup> Perfexion<sup>™</sup>.

**Method:** The new model of stereotactic radiosurgery machine, Perfexion<sup>™</sup>, with modified source configuration allows extended reach of targets located in the cranial, neck and cervical regions. The control system allows automatic selection of appropriate built-in collimator modules eliminating the need of time consuming manual installation of collimator helmets as in the older model of Gamma Knife system. However, the geometric configuration of collimator modules cannot be easily verified. The conventional method of exposing a film at the isocenter plane provides only a composited dose image, which is difficult to interpret in terms of the integrity of each individual source and corresponding collimator system. A method has been developed to capture a panoramic view of 192 Cobalt sources and corresponding images are utilized to verify the integrity and configuration of 192 sources. The images were acquired by exposing Gafchromic films wrapped around the surface of a specially designed 16 cm diameter cylindrical phantom. The phantom was mounted at the isocenter, with its axis aligned along the longitudinal axis of the couch. Depending upon the azimuthal angle of the source location, the shape and size of the source images were calculated and compared with the acquired images.

**Results:** The images allowed clear identification of each of the 192 sources, verifying their integrity and selected collimator sizes. In this presentation the results of the source image alignment with respect to the expected collimator geometry will be described. In addition, the feasibility of relative dosimetric evaluation of the individual sources by the panoramic images will be presented.

**Conclusion:** This method of source/ collimator verification by panoramic imaging can provide an enhancement of commissioning and routine quality assurance of the Gamma Knife systems.