Leksell Gamma Knife Perfexion

Leksell Gamma Knife Radiosurgery Perfexion[™] - stereotactic radiosurgery system.

http://www.elekta.com/healthcare-professionals/products/elekta-neuroscience/gamma-knife-surgery/g amma-knife-perfexion.html

The design of the Leksell Gamma Knife Perfexion facilitates stereotactic radiosurgery (SRS) on cervical spine targets provided that the target itself is located superior to the standard G stereotactic head frame base ring and does not move.

A study was designed to measure potential deviations of targets in the upper cervical spine while using the currently available Leksell Coordinate Frame G.

A commercially available skull-and-cervical spine model was adapted for SRS using the Leksell Gamma Knife Perfexion. The Leksell Coordinate Frame G was attached to the model, and both CT and fluoroscopic imaging were performed to determine the potential for target deviation at standard Gamma Knife treatment angles of 70°, 90°, and 110°. In addition, target deviations observed at various heights of the patient positioning table were analyzed using a pair of orthogonal fluoroscopic images obtained at a standard 90° gamma angle and compared with target position as it relates to a reference bed height of 4.5 cm.

An examination of multiple radiopaque targets embedded in or affixed to the model showed target deviations ranging from as low as 3.53 mm at the medial occiput-C1 junction to 15.56 mm at the C3-4 level during 70° extension. Target deviations at 110° flexion relative to targets on a 90° CT scan included deviations ranging from 0.58 mm at the medial occiput-C1 junction to 13.32 mm at the medial C3-4 level. Relative to targets observed at the Perfexion table height of 4.5 cm, target deviation at a table height of 3 cm varied from 0.44 to 5.26 mm. At a table height of 5.5 cm, target deviation varied from 0.62 to 4.30 mm.

Target deviation grossly exceeded clinical tolerance and was greater the farther the distance between the cranial base and the cervical spine target. Simple and reproducible methods that allow SRS centers to immobilize the patient's cervical spine using the currently available model G head frame are necessary to increase the range of targets that can be treated safely using the Leksell Gamma Knife Perfexion ¹⁾.

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Tonetti D, Bhatnagar J, Lunsford LD. Quantitative analysis of movement of a cervical target during stereotactic radiosurgery using the Leksell Gamma Knife Perfexion. J Neurosurg. 2012 Dec;117 Suppl:211-6. doi: 10.3171/2012.3.GKS1266. PubMed PMID: 23205812.

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