

3653

## **Implementation of an in Vivo Diode Dosimetry for the CyberKnife**

Jung-Kyun Bong<sup>1</sup> Young Nam Kang<sup>1</sup>, Jisun Jang<sup>2</sup>, Byung Ock Choi<sup>1</sup>, Sangwook Lim<sup>3</sup>, and Ihl Bohng Choi<sup>1</sup>

<sup>1</sup> Dept. of Radiation Oncology, the Catholic University of Korea, <sup>2</sup> CyberKnife Center, the Catholic University of Korea, <sup>3</sup> Kosin University, Gostel Hospital

[jkbong@hotmail.com](mailto:jkbong@hotmail.com)

Dose measurements were made on the peripheral surface as well as both of the entrance and exit ones with an in vivo dosimetry system and they were evaluated during the irradiation from the CyberKnife. The CyberKnife is a radiation treatment system that incorporates a robotic arm to precisely position a 6-MV linear accelerator, it is free to move and can be directed at nearly any point within a patient by a computer-controlled robotic arm (KUKA, Germany) with six degrees of freedom. Three IVD 1135 systems (SUN Nuclear Corporation, Melbourne, FL) were connected with nine n-type semiconductor diodes (ISORAD-III model, SUN Nuclear Corporation, Melbourne, FL). The diodes had intrinsic buildup material for the range of 6-12MV photons. The calibration of the diodes was performed for changes in diode sensitivity and cone size with 80-cm source-to-surface distance. The cone sizes used for the collimation of the CyberKnife were 5, 7.5, 10, 12.5, 15, 20, 25, 30, 35, 40, 50, and 60 mm. After the calibration, the diodes were placed on the surface of an anthropomorphic phantom and then irradiated with radiation dose of 100 MU. The difference between calculated and 1% for phantom measurements. This study±measured diode readings are within showed the feasibility to monitor surface dose using the diode systems for the CyberKnife.

**Keywords :** Cyberknife, in Vivo Diode Dosimetry, Surface Dose