

Verification of Mechanical Rotation Axes for Fractionated Stereotactic Radiotherapy (FSRT) using Dial-Gage

Hyun Joo Park¹⁾, Dong Han Lee¹⁾, Suk Lee¹⁾, Chul Koo Cho¹⁾, Hyung Jun Yoo¹⁾,
Kwang Mo Yang¹⁾, Dong Oh Shin²⁾ and Young Hoon Ji¹⁾

Lab. of Radiat. Effect, Korea Cancer Center Hospital¹⁾,
Dept. of Physics Graduate School, Kyonggi Univ.²⁾

INTRODUCTION

The need for high geometric accuracy in Fractionated Stereotactic Radiotherapy (FSRT) requires a special Quality Assurance (QA) program that goes beyond those QA procedures generally applied to routine radiation therapy. To develop a method for the verification of mechanical rotation axes for FSRT using Dial-gage.

METHOD

Verification of mechanical rotation axes of a linear accelerator (Mevatron, Siemens, USA) for FSRT equipped with the Dial-gage was performed to evaluate this system. Geometrical QA, including auxiliary collimator, gantry, couch rotation axis can be easily performed by Dial-gage. The device is measured (1/100 mm) for rotation axis or flatness of object. So construction of the pointer. Pointer is designed and constructed on a simple method, mounted on a collimator, couch board. And this Dial-gage system is compared with that of conventional method.

RESULTS

The combination of auxiliary collimator-gantry rotation axis tests analysis shows 0.45 mm differences for various angles. The combination of couch-auxiliary collimator (or gantry-couch) rotation axis analyzed as the same method as auxiliary collimator-gantry rotation axis. The differences of couch-auxiliary collimator, gantry-couch rotation axis is 0.87 mm, 1.13 mm.

DISCUSSION

The method for data analysis is faster than conventional method and the results are good for the goal and accurate within a millimeter range.

CONCLUSION

Dial-gage system is proven to be a good tool for the verification of mechanical rotation axes for FSRT.