

## Design the dose verification phantom by 3-dimensional mounting system for Linac-based radiosurgery

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**Purpose:** To verifying the dose distribution in 3-dimensional irradiation beam in linac-based radiosurgery system, the phantom was designed to get an axial, sagittal and coronal plane with film or TLD charge.

**Method:** The verification of radiation distribution is very important in linac-based radiosurgery with characteristic non-coplanar irradiation mode. The authors developed the dose verification phantom with film or TLD mount of three dimensional plane without changed the position of skull phantom. The phantom was assembled three different part of skull phantom of Mix-D materials, rectangular acrylic pipe and detector charger of polyethylene plate. The material of skull phantom was made of Mix-D ( paraffin 60.8%, polyethylene 30.4%, MgO 6.4%, TiO 2.4%) with frame of skull phantom. The area or volume of detector plate for film or TLD chip is 10 cm x 10 cm x 10 cm) of width, length and height, respectively.

**Results:** The clinical dosimetric quality assurance for linac-based radiosurgery irradiation was performed with home designed skull phantom in Photon Knife system which non-coplanar beams are combined the trans-multiarcs in characteristic beam angles. The attenuation of skull phantom made from Mix-D was very similar to that of the water in 6MV x rays in small field irradiation. The dosimetry in clinical linac-based radiosurgery was accomplished to get dose distribution in axial, sagittal and coronal plane without change of mounting the skull phantom and head ring device.

**Conclusion:** A dosimetric assurance of linac-based non-coplanar irradiation was accomplished with three dimensional plane phantom has been constructed which consists of Mix-D shaped as Random skull.