

Use of dynamic multileaf collimator (DMLC) as a dose compensator for the spine field in the treatment of medulloblastoma is studied. The spine is often treated with an elongated photon field which covers the whole spine axis. The dose variation along the spine can vary by as much as 20 % due to its variable depths under the skin. The method devised here accounts for the physical limitations of DMLC and independent jaws available on the VarianTM 2100CD in creating a one-dimensional intensity modulated beam to deliver the uniform prescribed dose of 120 cGy along the spinal cord. The intensity distribution necessary to deliver such modulated fields is designed, at 0.5 cm increments, based on measured beam parameters, such as TMR, OAR, S_{cp} , etc., using a forward planning system. Preliminary calculations are based on the secondary collimator settings obtained after dividing the 6x40 field into four 6x10 field segments. Nominal base line dose, which does not impose too much constraint on generation of leaf-motion is subtracted in order to improve both the total treatment time involved as well as the errors introduced at the field junctions. The actual arrangement used to deliver the actual treatment is used to account for transmission through the DMLC leaves. The agreement between the planned and measured intensity profiles is within 2.0 % for the shape of the profile except at the field junctions where it is up to 3 %. This is regardless of variations in S_{cp} for small temporal field sizes involved in intensity modulation. For comparison purposes, the beam delivery is done using both step-and-shoot and dynamic dose delivery methods. Both methodologies produce comparable results in this implementation.