

The use of a miniature multileaf collimator (MMLC) has been proposed to optimize conformal stereotactic radiotherapy (CSRT). The purpose of this study is to report on the clinical implementation of CSRT using an MMLC for beam shaping and a relocatable non-invasive head frame for immobilization. The first step in the procedure is to customize the head frame by constructing an impression of the patient's upper dentition and an occipital support. A set of CT images is obtained with the localization frame attached to the head frame. The localization frame is then replaced with the daily setup frame. Five reference tattoo points are marked on the patient's skin to ensure reproducibility of the patient's position. An optimal treatment plan is generated along with leaf settings for the MMLC treatment fields. MMLC light fields are verified using a target verification device with the projected field shapes generated from the treatment planning system. Light fields are compared to radiation fields at d_{max} using film with an agreement criterion of 0.3 mm. For verification purpose, the output for each field is measured and compared to the calculated output and the difference is within 1%. Dose distributions and dose-volume histograms are also presented. The time for pre-treatment quality assurance is approximately 15 minutes and the treatment setup and delivery time is approximately 20 to 30 minutes.