

Head and neck cancers using intensity modulated radiation therapy poses issues of uncertainty with skin and superficial doses. This is because of the inability of the treatment planning system to accurately predict the dose to the surface. This experiment was done to determine the extent of dose differences between measured and calculated for superficial dose in head and neck IMRT. To simulate the head and neck region, two semi-hemisphere solid phantoms were CT scanned. Two radiochromic films were used. First film was a small strip-film wrapped around the top of the hemispheres. The second film was cut in the shape of phantom and sandwiched between the two half-hemisphere phantoms. The CT images were pushed to ADAC Pinnacle and NOMOS Corvus treatment planning system. Two targets, shallow and deep target, and three critical organs, left and right parotid gland and spinal cord, were delineated and planned. Before delivering the treatment, an inhomogeneity correction was done using a double exposure technique to the radiochromic film. Subsequently, image registration was done using a mutual information technique. For ADAC Pinnacle system, the net dose difference between measured and calculated was determined to have a mean of 246.0 cGy(4.6% of prescribed dose, 5400 cGy) with S.D. =196.7 cGy(3.6%) for shallow target and 221.2 cGy(4.1%) with S.D. =177.7 cGy(3.3%) for deep target. The surface dose to the shallow and deep target which was obtained from strip-film was approximately 3100 cGy(57.4%) and 360 cGy(6.7%) respectively. Similar results were obtained with NOMOS Corvus planning system.