

THE EFFECT OF A GAP UNDER BOLUS TO THE SURFACE DOSE IN OBLIQUE ELECTRON BEAMS

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The aim of this study is to determine the effect of a gap under bolus to the surface dose in oblique electron beams. Irradiations with 6 MeV electron beams were made for the incidence degrees of 0°, 15°, 30°, 45°, 60°, 75° using two different bolus set-ups using 10 mm bolus and 5 mm bolus in presence of a gap of 2 and 4 mm gaps. A set of gafchromic films pieces placed on the phantom surface were irradiated with a 400 cGy dose for each set-up. It was seen that there was a large surface dose decreasing in highly oblique incidence angles in the presence of a gap under the bolus. For example, the relative surface dose for 10 mm bolus and 4 mm gap are 1.00, 1.00, 1.04, 1.14, 1.00 and 0.44 for 0°, 15°, 30°, 45°, 60° and 75° incidence angles, respectively. For 5 mm and 4 mm gap are 1.00, 0.98, 0.98, 0.79, 0.45, and 0.17 for 0°, 15°, 30°, 45°, 60° and 75° incidence angles, respectively. The use of bolus in the treatment of highly oblique surfaces with electron beams significantly decreases the surface dose in presence of a gap under the bolus. Therefore, the treatment fields should be as nearly perpendicular to the treatment beam axis and also, there should not be a gap between bolus and the skin.