Purpose: To evaluate the radiation dosimetry of bolus electron conformal therapy (ECT) using new commercially available bolus fabrication software.

Methods: A customized electron bolus was designed using 3D planning system (TPS) Eclipse Ver.8.6.15 (Varian) and p.d ECT (decimal) software. Computed tomography (CT) images of tough water were obtained and the planning target volume (PTV) was assumed. The proximal surface of the bolus was designed to conform to the 90% isodose line to the distal surface of the PTV using p.d ECT. Dose was calculated with a pencil beam algorithm for review with TPS. Based on structure set from TPS, bolus was fabricated using a computer-controlled milling machine. To evaluate the dose distribution, CT images with the bolus on the tough water were acquired and final dose distribution was computed. Gafchromic EBT 2 film (Lot A09171002, ISP) were sandwiched between tough water at 1, 2 and 3 cm depth from the bottom of bolus and irradiated at same geometry with planning. Film was scanned by EPSON GTX970 scanner and that 2D dose distribution is compared with calculation.

Results: 2D dose distribution showed qualitative agreement between calculation and measurement, absolute dose value is corresponded within 3% in the region of PTV. The pass rates of the gamma test were greater than 90% at 3 cm depth.

Conclusions: In this study the dose distribution for bolus ECT was measured by EBT 2 film. The 3D electron bolus which is fabricated by p.d ECT software reproduce the accurate dose distribution that is calculated with TPS.