

Purpose: To spare parts of the lymphatic drainage, muscle and skeleton of the lower extremities, a treatment technique using a helical tomotherapy (HT) for Classic Kaposi's sarcoma (KS) was developed and the analysis of surface doses around the lesion was performed.

Methods: To achieve a homogenous dose distribution over the surface of the lower extremity, the gaps between the toes of the foot of a patient were packed by a thermal plastic material (poly-flex II). For more effective immobilization and precise localization, the poly-flex II-covering foot mold was enclosed by the water-equivalent wax shaped into a brick and marked the localization (wax-mold). A treatment planning CT of the patient with the custom-made wax-poly-flex II brick was taken. CTV was contoured around the lesion surface with at least 0.5 cm depth. The PTV was created by expanding an isotropic 0.5 cm margin from CTV. A core structure spaced with 0.5 cm from PTV was contoured and assigned as a constraint to achieve steep dose gradient at shallow region. A prescribed dose (Dp) of 37.5 Gy in 15 fractions with a field width of 2.5 cm and a pitch of 0.287 were used for Tomotherapy Hi Art Planning system. MVCT image registration was performed before daily treatment. The surface doses around the lesions were measured by EBT2 films.

Results: The 95% of Dp was received by at least 95% of PTV, and the maximum dose was less than 110% of Dp. The dose distribution in the central core fell off steeply with the mean dose of 50% of Dp. The measured doses were 94 to 99% of Dp.

Conclusions: Combined with the image-guided HT and wax-mold device, an adequate doses to the skin can be achieved and the doses to the normal structures can be reduced significantly for KS at lower-extremity irradiation.