CT assisted 3D high-dose-rate brachytherapy (HDR-BT) in the treatment of skin carcinomas

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Purpose: Our goal was to demonstrate the feasibility of 3D CT assisted high-dose-rate brachytherapy connected with individual molds in the treatment of non-melanoma skin cancers.

Material and methods: From December 2003 to January 2009 40 patients (22 male, 18 female) with 42 basal cell or squamous cell carcinomas on the face were treated with 3D CT assisted HDR-BT. Mean age was 71 years (46-85). 38 patients received BT as a boost treatment after external beam radiotherapy (EBRT), while in 2 patient BT was used alone. A total of 11 patients were irradiated as first-line therapy, while the remaining 29 patients had local recurrences or incomplete resection. In all cases custom made molds were constructed and planning CT was performed. 3D conformal planning was carried out using dose point optimization or anatomy based inverse planning with or without graphical optimisation. The average dose of EBRT was 40 Gy (30-50.4 Gy). The mean dose of boost HDR-BT

administered was 13 Gy (8-20 Gy). The average fraction size was 1.9 Gy (1.8-2.5 Gy).

Results: All patients with macroscopic tumors had complete remission. During the mean of 31 months (range 2-48) follow-up period 2 (5%) local recurrences were observed, while 2 (5%) patients developed second primary skin cancers. No regional or distant failure was noted. The achieved true local control rate for all patients is 98%. According to the Common Toxicity Criteria Scoring system no grade 3-4 acute and late complications were observed. The reproducibility of the catheters and the treatment tolerance were excellent in all cases.

Conclusions: 3D conformal CT assisted HDR-BT boost is a feasible, safe and effective treatment modality. Treatment is well tolerated with minor acute and late sequelae or complications. Monotherapy is planned in the near future.