3D CT based high dose rate interstitial brachytherapy for localized breast cancer – Plan evaluation our experience

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Purpose: Our present protocol for HDR interstitial brachytherapy treatment for localized breast cancer using Nucletron designed templates for double and three plane and etc with different number needle provision in 1 cm spacing chosen template depends of upon the patients. Our plan evaluation is based on the target coverage using and skin sparing.

Material and methods: 3 mm slice thickness of CT images of interstitial implants patients images were transferred to virtual simulation for skin and target contouring. PLATO BPS 14.3.5 is used for needle reconstruction and source position are inside the target and give 5 mm margin from skin analyze by each needles source positions using 3D reconstructed view of target and needles. Two plans were created for each patient. Plan 1 is dose points created around the target with 5 mm spacing and another plan is dose points created on triangular needles (basal dose points). Dose prescribed for dose points and geometrical optimization combined with graphical optimization for each plan.

Results: Most of our implants are two plane and three plane. We found two plane implants are shows better optimal conformal index and dose homogeneity using basal point method with geometrically optimized. In another case three plane implants shows optimal values of conformal index and dose homogeneity index for dose points around the target with 5 mm spacing.

Conclusions: In both cases, inactivate the source position closer to the skin within 5 mm for each needle that will enable very good skin sparing. Excellent clinical outcome.