to patients'anatomical variability; while PQM referred to the current state of plan, APQM described its future best possible condition. We calculated PQM and APQM for the retrospective prostate plans. Applying the new SI-DVH in the optimizer as plan objective to achieve, we replanned ten prostate cases, defining DPQM as the difference between replanned PQM (rPQM) and PQM obtained previously.

Results

Setting the maximum PQM to 200, achievable ideally, we obtained a median PQM and APQM equal to, respectively, 133 (range:82÷177) and 154 (range:109÷189). After replanning we obtained a median rPQM equal to 161, a median rAPQM equal to 176, and an average DPQM equal to 10% (range: 5%÷16%). In terms of dose distribution, after replanning, we observed a decrease up to 10% of the dose delivered to the OAR's. The maximum difference before and after replanning in dose distribution was observed in intermediate dose area.

Conclusion

SI-DVH method is a promising method which allows for simple quantification and optimization of plans against historical experiences based on contouring, protocol preparation and dose scheduling. The personalized hard score and an ideal DVH to reach could aid planners in generating treatment plans that push the limits of OAR sparing, defined by QUANTEC, that can be considered as easily achievable.

EP-1961 Classical Kaposi's sarcoma treatment with helical tomotherapy: impact of polyurethane foam cushion

M. Iacco[1], S. Saldi[2], C. Zucchetti[1], A.C. Dipilato[1], V. Lancellotta[2], C. Aristei[2], R. Tarducci[1]
[1]*Santa Maria della Misericordia Hospital, Medical Physics Department, Perugia, Italy*
[2]*Santa Maria della Misericordia Hospital, Radiation Oncology Department, Perugia, Italy*

Purpose or Objective

Classical Kaposi's sarcoma (KS) usually involves the skin of the lower extremities and was generally treated with large parallel and opposed photon beam. To spare muscles and bones, a treatment with Helical Tomotherapy (HT) was performed. Because of the skin involvement two polyurethane foam cushions (PFC) were applied as immobilization devices and as bolus material, in a "shell" configuration.

Material and Methods

A 92 years old man with a KS referred to our center to be treated to both legs (from limbs to fits). The patient was asked to positioning himself as comfortably as possible in to a polyurethane foam cushion. After the complete solidification of the polyurethane, another cushion was used to cover up the upper surface. Both cushions were positioned as close as possible to the surface, in order to act as a bolus material. CTV included the area of macroscopic disease, visible in CT, including skin and edema, avoiding muscle and bones. PTV was created by 5mm expansion in all direction from the CTV. A core structure distant 2mm from the PTV was created for each leg and completely blocked in order to force HT to deliver only tangential beams to the PTV. The prescribed dose (D_p) was 60Gy in 30 fractions to the PTV_{eval} (PTV contracted 2mm from skin), according to guidelines [1]. Because of the length of target (1m) a large field width (5.02cm), pitch of 0.430, and modulation factor of 2.0 were used. MVCT was performed daily before treatment. The irradiation time resulting in 15 minutes and the time required for the positioning and the MVCT was about 20 minutes. The surface doses was measured on the first session by means of EBT3 films: 24 films (2cmx2.5cm) were placed all over the skin of the legs and feet.

Results

The minimum ($D_{98\%}$), maximum ($D_{2\%}$) and mean doses (D_{mean}) to the PTV_{eval} were respectively 56.4Gy, 62.8Gy, 60.0Gy with a Homogeneity Index of 0.108. The D_{mean} of the core region was 43.0Gy. The density of the polyurethane foam cushion was measured from the CT and resulted in 0.0066 g/cm^3. The skin region (extended 2mm inside the body contour) received a D_{mean} of 58.9Gy (98% of D_p) and a $D_{98\%}$ of 57.0Gy (82% of D_p). The measured doses ranged from 83% (in the instep region) end 94% (on the central and larger region of the thigh) of D_p with a mean value of 88% (1.75 Gy).

Conclusion

In KS lower extremity irradiation, the combination of a core blocked HT and the PSC shell offered an adequate dose coverage on the whole target, including the skin, spearing at the same time the muscles and skeleton.

[1] London Cancer – Skin Cancer Radiotherapy Guidelines, August 2013, lead autor: Girija Anand

EP-1962 Simultaneous integrated boost IMRT Sliding Window in hypofractionated left-sided breast carcinoma

D. Morera[1], F. Sansaloni[1], I. Ortiz[2], R. Roncero[2], J. Romero[1], M.D.C. Costa[1], M.J. Sánchez[1], J. Font[1], J. Pardo[2], M. Vidal[2], L. Valencia[2]
[1]*Hospital Universitario Son Espases, Medical Physics, Palma de Mallorca, Spain*
[2]*Hospital Universitario Son Espases, Radiation Oncology, Palma de Mallorca, Spain*

Purpose or Objective

Nowadays is increasing the concerned of cardiac toxicity in patients with left-sided breast carcinoma due to cardiac irradiation during radiation therapy, mainly in young patients. New radiation therapy techniques like Intensity Modulated Radiotherapy (IMRT) may help in order to decrease this risk. The objective of this work is to perform a dosimetric comparison between three-dimensional conformal radiation therapy (3DCRT) with sequential boost, versus IMRT sliding window with simultaneous Integrated Boost (SIB), in hypofractionated patients.

Material and Methods

Eighteen patients with left-sided breast carcinoma, previously treated in our center with hypofractionated 3DCRT classic tangential technique, and hypofractionated sequential boost to the tumour bed, were replanned in IMRT sliding window with SIB. The squeme with 3DCRT was 40.05Gy (2.67 Gy/fraction) to the whole breast, and sequentially 13.35 Gy (2.67 Gy/fraction) to the boost. To perform IMRT treatment plans, boost has been integrated in order to plan the whole treatment in 15 sessions, being the dose to the boost 48 Gy (3.2 Gy/fraction) and 40.05Gy (2.67 Gy/fraction) to the whole breast. All IMRT plans were optimized with a Photon Optimizer (PO) v13 algorithm, and calculated with Analytical Anisotropic Algorithm (AAA) v13. The technique performed has been six tangential fields, three for each side, around 295 °, 310 °, 325 °, 115 °, 130 ° and 145 °. The main point of these plans were that only the classic tangential, 310° and 130° had no constraint beam, irradiating the whole PTV, the other four fields had fixed jaws during the optimization, in order to avoid the irradiation of the heart. Treatments were evaluated using cumulative dose-volume histogram (DVH) data for Organs at risk (OARs) and PTVs.