Material and Methods: At the NKI a project was started to develop single-click treatment planning for techniques based on a class solution. Technically this was accomplished by separating medical planning protocol definition from actual control of the treatment planning system (Pinnacle3, version 9.10, Philips Medical Systems). After target delineation, a single mouse-click initiates the following actions: Pinnacle patient record generation, auto-segmentation of organs at risk (OARs), beam setup, optimization of the dose distribution, and creation of PDF documentation. The plan is then ready for inspection by RTT and physician. This procedure is currently implemented into our clinic for prostate, breast and vertebral metastases. Currently, knowledge and skills among RTTs is primarily maintained by the requirement to perform a certain number of treatment plans per year for a given tumor site. In addition, all treatment plans are checked by a second RTT, and feedback is given on deviations from protocol and/or possibilities to improve the plan. Finally, special cases are discussed with all RTTs on a monthly basis.

Results: A fully automated treatment plan requires 20 minutes for prostate and breast, and 7 minutes for vertebral metastases. Up to now, 185 patients have received a fully automated treatment planning procedure. In about 15% of the cases, the automatically produced plan required manual adjustment, either because of errors in auto-segmentation of OARs, or due to a sub-optimal dose distribution. In general, RTT hands-on time reduced with up to 2 hours per plan, while maintaining plan quality. To prevent loss of knowledge and skills among RTTs, 10% of the requested plans for a tumor site are randomly assigned for manual treatment planning. In addition, planning challenges are organized in which a number of RTTs makes a treatment plan for the same patient. The results are discussed with all RTTs.

Conclusion: Complete automation of the treatment planning process is feasible for selected tumor sites and results in considerable reduction of hands-on time. By designing new QA methods, loss of skills and knowledge among RTTs can be prevented, thus ensuring that RTTs remain capable of manually designing and/or adapting treatment plans.

Poster Viewing : 1: Brachytherapy

PV-0033 Assessing dose contribution to pelvic lymph nodes in intracavitary brachytherapy for cervical cancer G.W.Y. Chua1, D.B.H. Tan1, G.H. Tay1, Y.W. Foo1 National Cancer Centre - Singapore, Department of Radiation Oncology, Singapore, Singapore

Purpose or Objective: In definitive radiotherapy for cervical cancer, a HDR brachytherapy boost is most commonly used after external beam radiation (EBRT). While brachytherapy doses are chosen such that a cumulative EqD2 of 80 to 90 Gy is delivered to the primary tumour after a 45 to 50.4 Gy EBRT dose, there is less certainty regarding the brachytherapy dose contribution to pelvic lymph nodes. This poses a challenge as to how high a preceding EBRT dose should be prescribed to gross nodal disease, in order to achieve a cumulative tumoricidal effect. While the use of MRI guided 3-dimensional brachytherapy is increasing, the point-based Manchester system remains the most widely utilized technique. The objective of this study is to determine the brachytherapy dose contribution to individual pelvic lymph node regions, using CT planning with the Manchester system.

Material and Methods: CT planning datasets from 40 patients who had undergone intracavitary HDR brachytherapy for stage III or IVA cervical cancer were retrieved. All patients received prior 3D conformal EBRT to a dose of 50.4 Gy in 28 fractions, followed by four fractions of CT-based brachytherapy, prescribing to Manchester point A. Half of the patients (n=20) received a brachytherapy dose of 5 Gy per fraction, while the other half received 6 Gy. Decision on brachytherapy dose was dependent on the ability to meet D2cc constraints for the adjacent organs-at-risk. Following international consensus guidelines, the right and left external iliac, internal iliac and obturator groups of lymph nodes were separately contoured on the CT dataset (see Figure 1). Applying the initial brachytherapy plan on the Oncentra TPS, mean doses to each nodal group according to laterality (i.e. left and right) were calculated for each patient, and both results combined to obtain the average mean dose to the entire nodal group. All individual patient results were then averaged across the respective study groups (5 and 6 Gy groups) and corresponding EqD2s calculated.

Results: A summary of results is shown in Table 1. For patients who received a per fraction brachytherapy dose of 5 Gy, average mean absolute dose to the external iliac, internal iliac, and obturator nodal groups was 0.80 Gy, 1.12 Gy and 1.34 Gy respectively. The corresponding EqD2s were 0.72 Gy, 1.05 Gy, and 1.28 Gy respectively.

For patients who received a per fraction brachytherapy dose of 6 Gy, average mean absolute dose to the external iliac, internal iliac, and obturator nodal groups was 1.16 Gy, 1.56 Gy and 1.80 Gy respectively. The corresponding EqD2s were 1.08 Gy, 1.50 Gy and 1.79 Gy respectively.
Conclusion: Our study demonstrates that the pelvic lymph nodes receive a significant dose contribution from brachytherapy in cervical cancer, when employing the Manchester prescription system. This must be taken into account during external beam radiotherapy planning, and adequate external beam boost doses calculated to achieve cumulative tumoricidal doses to pelvic nodal disease.

PV-0034
HDR BT alone in endometrial cancer: up-date of Piedmont experience in 18 years (71 patients) S. Griveau1, U. Monetti2, E. Madon3, V. Richetto4, M. Tessa5, F. Moretti6, A. Ruggieri7, S. Cosma8, S. Danese5, A. Urgesi9 A.O.U. "Città della Salute e della Scienza di Torino" P.O. Sant Anna, Radiotherapy, Torino, Italy
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Purpose or Objective: Endometrial cancer is the mainly gynaecologic malignancy, 80-85% in stage I at diagnosis. The standard primary treatment remains TAH&BSO, with appropriate surgical staging. The epidemiology of this disease favours elderly, obese women with multiple medical problems (hypertension, diabetes, cardiovascular diseases, coagulation disorders, respiratory disorders) that render some of them medically inoperable. RT alone is the only efficient option for these women. BT is the main component in this cohort of patients (pts).

Material and Methods: September 1997-September 2015: 90 pts RT alone, 71 BT HDR alone. Median age 79 years (range 57-93). Staging: clinical examination, TVUS, MR or CT scan and fractionated curretage. Stage Ia 32 pts, Stage Ib 36 pts, Stage II 3 pts. OS, DSS, LC and late side effects were analysed retrospectively. Follow-up > 10 years (mean 57 months). BT HDR with Rotte "Y" applicator, plus VBT in stage II. Dose prescription at "uterine points" that are two points located 1 cm over the middle of a line drawn between the tips of the two ends of the "Y" applicator and at series of points placed laterally to the tandem according to the pre-treatment imaging data. We treat the entire length of the uterus to ensure coverage of the fund. To maintain the bladder and rectal maximum point doses below 100% of the prescribed dose we optimize with TPS. Until 2002 BT was performed 4-5 times, weekly, mean dose 29.3 Gy (range 18-35 Gy); from 2003 (42 pts) we deliver 30 Gy in five frs, 6 Gy each b.i.d. schedule, 6 hours interval between frs.

Results: 5 years OS, DSS and LC: 52.1%, 85.9%, and 91.2%. Stage Ia: 56.3%, 87.5%, and 90.6%; Stage Ib: 50%, 86.1%, and 94.4%; Stage II: 33.3%, 66.7%, and 66.7%. DSS was not affected by tumour grade or age. One patient had a PD, 6 (10.6%) developed recurrence after a median of 13 months (3 with distant metastases), 2 (3.3%) a lymph node recurrence with distant metastases. One patient has a GE grade III late side effect (1.8%) at 5 years, not related with rectal dose.

Conclusion: HDR BT with "Y" applicator is a very effective treatment modality with good LC rates and suitable DSS for pts who are not fit for surgery. This technique has proven to have a low risk of acute complications and long-term side effects. Longer follow-up will be required to document the incidence of late effects using the b.i.d. schedule. In the short term, it seems that this approach is a feasible way to limit the number of procedural complications and length of hospital stay and bed rest.

PV-0035
Electronic brachytherapy for basal cell carcinoma: two prospective pilot trials with different doses D. Pons1, R. Ballesster-Sánchez2, A. Candelas-Juan3, F.J. Celada-Álvarez1, C. Barker4, R. Chicas-Setti3, J. Burgos-Burgos4, D. Farga-Albiol5, M.J. Pérez-Calatayud4, A. Tormo-Mico6, J. Pérez-Calatayud4, R. Botella-Estrada7 1Hospital Universitario y Politecnico La Fe, Radiotherapy, Valencia, Spain 2La Fe University and Polytechnic Hospital, Dermatology Department., Valencia, Spain 3La Fe University and Polytechnic Hospital, Radiotherapy Physics Section- Oncology Department, Valencia, Spain 4La Fe University and Polytechnic Hospital, Radiation Oncology Department, Valencia, Spain 5Memorial Sloan Kettering Cancer Center, Department of Radiation Oncology, New York, USA 6La Fe University and Polytechnic Hospital, Radiotherapy Physics Section- Radiation Oncology Department, Valencia, Spain
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Purpose or Objective: Basal cell carcinoma (BCC) is a very common cancer in the Caucasian population. Treatment aims to eradicate the tumor with the lowest possible functional and aesthetic impact. Electronic brachytherapy (EBT) is a treatment technique currently emerging. This study aims to show the outcomes of two consecutive prospective pilot clinical trials using different radiation doses of EBT with Esteya® EB system for the treatment of superficial and nodular basal cell carcinoma.

Material and Methods: Two prospective, single-center, non-randomized, pilot studies were conducted. Twenty patients were treated in each study with different doses. The first group (1) was treated with 36.6 Gy in 6 fractions of 6.1 Gy and the second group (2) with 42 Gy in 6 fractions of 7 Gy. In one case the 6.1 Gy/fraction resulting from the theoretical RBE calculation was used, and in the second arm (7 Gy/fraction) the same dose as the Valencia applicator study was used. Cure rate, acute toxicity and late toxicity related to cosmesis were analyzed in the two treatment groups.

Results: In group 1, a complete response in 90% of cases was observed at the 1 year follow-up, whereas in group 2 the complete response was 95%. Tumor persistence or recurrence was suspected clinically and dermoscopically in two patients in the first group at 3 and 6 months respectively and in one patient in the second group at 1 year follow-up. The differences with reference to acute toxicity and the cosmetic results between the two treatment groups were not statistically significant.

Conclusion: Our initial experience with Esteya® EB system to treat superficial and nodular BCC shows that a dose of 36.6 Gy and 42 Gy delivered in 6 fraction of 7 Gy achieves a 90% and 95% clinical cure rate at 1 year respectively. Both groups had a tolerable toxicity and a very good cosmesis.

PV-0036
Dosimetric evaluation of 3D printed applicators for High Dose Rate brachytherapy A. Vavassori1, R. Ricotti1, A. Bazani2, F. Pansini2, R. Spoto1,3, D. Ciardo1, V. Sammarco1, F. Cattani1, R. Orechla3, B.A. Jereczek-Fossa1,3 1European Institute of Oncology, Department of Radiation Oncology, Milan, Italy 2European Institute of Oncology, Unit of Medical Physics, Milan, Italy 3University of Milan, Department of Oncology and Hemato-oncology, Milan, Italy 4University of Milan, Tecniche di Radiologia Medica per Immagini e Radioterapia, Milan, Italy

Purpose or Objective: Feasibility and dosimetric study of 3D-printed cylindrical and skin mould applicators for High Dose Rate brachytherapy (HDR-BRT) using acrylonitrile butadiene styrene (ABS).

Material and Methods: Three cylindrical applicators (1 as reference and 2 as test) with a single 2.5 mm catheter channel and a 1 mm radial slit for radiochromic film support were 3D printed (HP3DX100, Hamlet, Dublin, IE) using ABS plastic. The reference had the radiochromic slit in contact