

Metabolic alterations in patients with prostate cancer treated with androgen deprivation with/without normalization of testosterone levels



J. Muñoz García, Y. Ríos Kavadoy, J. Quirós Rivero, M. Ropero Carmona, E. Capelo Medina, A. Corbacho Campos, A. Torres García, J. Cabrera Rodríguez

Hospital Infanta Cristina, Oncología Radioterápica, Spain

Objectives. To compare the incidence of metabolic alterations (hypercholesterolemia >200 mg/dl, hypertriglyceridemia >175 mg/dl and hyperglycemia >110 mg/dl) in patients (pts) with prostate cancer (PCa) treated with androgen deprivation therapy (ADT) with/without normalization of testosterone levels (NTL).

Materials and methods. Retrospective analysis of 304 pts with PCa, treated with ADT and radiotherapy in our hospital from October 2001 to December 2009, to compare the incidence of metabolic alterations in pts with/without NTL. 176 pts (58%) had normalization of testosterone levels with a median time of 10.4 months. Patients without NTL were significantly older, higher risk group and with increased median time of ADT. Median follow-up was 56 months (range 16–167). We examined the values of cholesterol, triglycerides and glucose in all the checkups during the follow up.

Results. In each group 48% of the pts had a record of metabolic alterations (23% and 30% hypercholesterolemia, 16% and 9% hyperglycemia and 9% and 10% a combination of hypercholesterolemia and hyperglycemia or hypertriglyceridemia). 88% and 89% of pts with or without NTL during the follow up had metabolic alterations (28% hypercholesterolemia in both groups, 9.4% and 8.5% hyperglycemia, 7% and 8% hypertriglyceridemia and 21% a combination of hypercholesterolemia and hyperglycemia with or without hypertriglyceridemia) and in 82% the disorder was present in more than one checkup.

Conclusions. Patients with PCa treated with ADT, with/without NTL had a similar prevalence of metabolic record alterations and incidence of metabolic disorder during the follow up. Hypercholesterolemia and hyperglycemia were the most frequent metabolic alterations found in these pts.

<http://dx.doi.org/10.1016/j.rpor.2013.03.497>

Metric based on anatomy for predicting image quality on prostate ecography IGRT



S. Pérez Echagüen¹, C. Sanz Freire², G. Ossola Lentati¹

¹Centro Investigacion Biomedica la Rioja, Oncología Radioterápica, Spain

²Centro Investigacion Biomedica la Rioja, Radiofísica y PR, Spain

Introduction. Inter- and intra-fractional position uncertainty of prostate is a key issue on radiation therapy. Modern conformal techniques involving the delivery of high dose gradients and dose escalation makes mandatory image guidance of the procedure. Transabdominal ecography image guided radiation therapy is an option for this purpose. Poor image quality can be considered the main drawback of the technique, preventing its use with some particular patients.

Aim. To derive an anatomy-based metric for prediction of image quality for these ecography IGRT procedures based on previously known anatomical parameters. The method should allow screening patients that are not suitable for ecography guidance, thus avoiding time-consuming and poor precision positioning procedures.

Methods. All the complete course of RT eco-images for a sample of 9 patients have been analyzed and scored. For each patient, a set of anatomical parameters that may be related to ecography image quality were analyzed, namely: isocenter depth, fat tissue thickness at the eco-probe level, bladder and prostate volume on the simulation CT image and level of pubic arc interference. Correlation between these set of parameters and image score has been studied.

Results. Weak correlation was found for Isocenter depth and prostate volume at a very poor significance level ($r = 0.42$, $p = 0.25$ and $r = 0.45$, $p = 0.23$ respectively) when considered individually. A modified metric of prostate depth was derived, based on Isocenter depth weighted by fat tissue thickness and prostate volume through three free parameters. Fine tuning of these parameters leads to a strong statistically significant correlation ($r = 0.71$, $p < 0.05$).

Conclusions. A simple and practical method based on this new metric has been developed for predicting image quality during eco-guided RT procedures. This allows for a screening of prostate patients that should not undergo ecography guidance during their course of radiation therapy.

<http://dx.doi.org/10.1016/j.rpor.2013.03.498>

Optimized PTV in IMRT and IGRT protocol “on line” with fiducial marks for determining the intrafraction motion of the prostate



M. Salas Buzón¹, L. Gutiérrez Bayard¹, L. Quiñones Rodríguez², L. de Ingunza Barón¹, I. Villanego Beltrán¹, V. Díaz Díaz¹, L. Díaz Gomez¹, E. Munive Álvarez¹, E. González Calvo¹

¹Hospital Universitario Puerta del Mar, Unidad de Atención Integral al Cáncer, Oncología Radioterápica, Spain

²Hospital Universitario Puerta del Mar, Unidad Clínica de Gestión Radiofísica, Spain

Prostate motion and setup errors are important sources of geometric uncertainty during IMRT. The aim of the study was to measure intrafraction prostate motions with implanted gold fiducial marker and use reduced PTV margins during the IMRT. We studied the motion of the prostate for 13 patients with biopsy proven low risk adenocarcinoma during 130 radiotherapy treatment fractions by assessing the position of 4 implanted gold markers. We obtained movies during each fraction using an

indirect method of estimating intra-fraction motion, because it is based on the comparison of prostate position on two EPID of MV: Before and immediately after the session ends. The position of the gold markers on each daily pair of EPIs was compared to their intended position, as seen on the reference DRR, to determine isocenter placement error, by using the marker matching functions. Patients were treated in the supine position using IMRT. The prescription dose was 76 Gy in 38 fractions. The PTV was required to be covered by 95% of the prescription dose. The mean intrafraction motion (\pm SD) was 0.02 ± 0.19 cm, 0.11 ± 0.18 cm and 0.11 ± 0.16 cm along the L–R, S–I and A–P axes respectively. If all pre-treatment isocenter placement errors have fully been completely corrected, leaving intra-fraction motion as the only variable affecting during-treatment isocenter placement, PTV margins of 0.36 cm, 0.36 cm and 0.26 cm would be required along the L–R, S–I and A–P axes respectively, to give a 95% probability of complete CTV coverage on any given treatment day. Concluding, while our estimates of CTV to PTV margin requirements along the L–I and S–I axes are comparable to other reports, our estimate of margin requirement along the A–P axis appears to be slightly less than in the other reports using image guidance.

<http://dx.doi.org/10.1016/j.rpor.2013.03.499>

Pattern care study on invasive bladder cancer at radiation oncology services in Spain

M. Salas Buzón¹, L. Gutiérrez Bayard¹, L. de Ingunza Barón¹, E. Munive Alvarez¹, I. Villanego Beltrán¹, V. Díaz Díaz², L. Díaz Gómez¹, E. González Calvo¹

¹Hospital Universitario Puerta del Mar, Unidad de Atención Integral al Cáncer, Oncología Radioterápica, Spain

²Hospital Universitario Puerto Real, Unidad de Atención Integral al Cáncer, Oncología Radioterápica, Spain



The combination of transurethral resection of the bladder, chemotherapy and radiation therapy is a validated approach to bladder preservation in cancer muscle-invasive. However there is very little information on the patterns of treatment with radiotherapy. The aim of this study was to assess therapeutic approaches to muscle-invasive bladder cancer at Radiation Oncology Services in Spain. A specifically designed questionnaire was submitted to 86 Radiation Oncology Services in Spain through the SEOR and URONCOR via e-mail in 2010, to assess their therapeutic approach to bladder cancer over the 2005–2009 period. A total of 26 centers (30.5% of the total, of which 96% were public and 81% were university hospitals) answered the questionnaire. 92% reported to have a Urology Tumor Board that makes consensual decisions on muscle-invasive bladder carcinomas. Treatment approaches was reported to be systematically determined by the Board at 92%. A total of 100% of hospitals provide radical 3D conformal radiation therapy and three hospitals also performed IMRT. The radiation therapy scheme designed for “bladder preservation” was reported to include both options: single-dose series (continuous irradiation without response evaluation after 40–45 Gy) or fractionated series (irradiation with response evaluation by cystoscopy and by radical transurethral resection after 40–45 Gy). A total of 64% of hospitals “always” perform single-dose series, of which 19% “sometimes” perform fractionated series. Twenty percent (five hospitals) “exclusively” perform fractionated series, with an average response evaluation interval of seven days. The average of patients on radical radiation therapy in 2005 was 51%; 47% in 2008, and 43% in 2009, with a statistically significant decreasing tendency ($p=0.02$). At public hospitals in Spain, there are multidisciplinary urology tumor boards where urologists, radiation oncologists and medical oncologists collaborate to systematically make consensual decisions. In this period there is a significant downward trend in the use of radiotherapy for bladder sparing.

<http://dx.doi.org/10.1016/j.rpor.2013.03.500>

Postoperative adjuvant or salvage radiotherapy (IMRT) after radical prostatectomy

A. Olarte Garcia¹, M. Rodríguez-ruiz¹, G. Valtueña¹, M. Moreno-jiménez¹, E. Arevalo², S. Fernández³, L. Arbea¹, M. Cambeiro¹, D. Rosell Costa⁴, J. Zudaire Berguera⁴, R. Martínez-monge¹, J. Aristu¹

¹Clinica Universitaria de Navarra, Radiation Oncology, Spain

²Clinica Universitaria de Navarra, Medical Oncology, Spain

³Clinica Universitaria de Navarra, Biochemistry, Spain

⁴Clinica Universitaria de Navarra, Urology, Spain



Purpose. Postoperative radiotherapy in prostate cancer patients treated with prostatectomy improves biochemical progression-free survival (BDFS) and in selected patients prolongs the overall survival. Pelvic IMRT in this group of patients has been poorly explored regarding acute and late toxicity compared with 3DCRT. We retrospectively analyze patients treated in our institution with IMRT after prostatectomy.

Material and methods. Patients with pT3-T4 and/or N+ and/or positive surgical margin received adjuvant IMRT (aIMRT). Patients with biochemical failure (PSA > 0.1 ng/ml) after prostatectomy were treated with salvage IMRT (sIMRT). Dose-range administered was 64–72 Gy in 30–33 fractions. High-risk or very high-risk patients received long-term androgen deprivation therapy.

Results. Ninety-six patients were analyzed, 34 were treated with aIMRT and 62 patients sIMRT. All patients completed the treatment protocol. The median time intervals from surgery to aIMRT and sIMRT were 3-months and 19.5-months, respectively. Adverse events were recorded following the CTCAE v4.0 score. Grade 1–2 and grade 3–4 acute GU toxicity were observed in 52 patients (54.2%) and 1 patient (1.0%), respectively. Thirty-seven patients (38.5%) had grade 1–2 acute GI toxicity and no patient with grade 3–4 GI complications was recorded. Eighty-five patients were evaluated for late complications and grade 1–2 chronic