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

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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 hypercholesterololemia 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.

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

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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.

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

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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...