Tumori, 96: 941-946, 2010

3D-conformal hypofractionated radiotherapy for prostate cancer with daily transabdominal ultrasonography prostate localization: toxicity and outcome of a pilot study

Dario Zerini[1], Barbara Alicja Jereczek-Fossa[1,2], Andrea Vavassori[1], Isa Bossi-Zanetti[1], Roberta Mauro[1], Giovanni Battista Ivaldi[1], Marco Trovò[2], Raffaella Cambria[3], Cristina Garibaldi[3], Federica Cattani[3], and Roberto Orecchia[1,2]

[1]Division of Radiotherapy, European Institute of Oncology, Milan; [2]University of Milan, Milan; [3]Division of Medical Physics, European Institute of Oncology, Milan, Italy

ABSTRACT

Aims and background. To evaluate the feasibility, toxicity and patient outcome of hypofractionated 3-dimensional conformal radiotherapy for low- and intermediate-risk prostate cancer, using daily an ultrasound targeting system (BAT™).

Methods. Between May 2005 and October 2006, 25 patients (cT1-T2, GS ≤7, mean initial PSA = 7.06 ng/ml) received a dose of 72 Gy in 30 fractions. Only the prostate was included in the clinical target volume. Immediately before each radiotherapy session, BAT™ ultrasound alignment was performed. Acute and late toxicity was evaluated according to the Radiation Therapy Oncology Group criteria; the Phoenix definition (PSA = nadir + 2 ng/ml) was applied to define biochemical failure. BAT™ localization data were provided for 300 out of 750 procedures.

Results. No interruptions in 3-dimensional conformal radiotherapy due to toxicity were registered. There was no acute rectal toxicity in 52% of patients; 28% had G1, 16% had G2, and 1 patient had a G3 event. No acute urinary toxicity was observed in 28% of the patients. G1 toxicity occurred in 40%, G2 in 28%, and G3 in 1 patient; no G4 event was observed. With an average follow-up of 45 months, one biochemical relapse was observed; late toxicity showed an excellent profile: 78% of the patients had no rectal toxicity, 16% had G1, and 1 patient had G2 toxicity. Most of the patients (68%) had no late urinary complications, whereas 32% had G1 toxicity. Localization data showed systematic and random errors in relation to some procedure biases.

Conclusions. Promising tumor control and toxicity profile were observed with this mildly hypofractionated BAT-based 3-dimensional conformal radiotherapy. Free full text available at www.tumorionline.it

Key words: hypofractionation, image-guided radiotherapy, prostate cancer, ultrasound imaging.

Acknowledgments: Dr Zerini was supported by a grant from the American-Italian Cancer Foundation (AICF).

Correspondence to: Dario Zerini, MD, Div. of Radiotherapy, European Institute of Oncology, via Ripamonti 435, 20141 Milano, Italy.
Tel +39-02-57489037;
fax +39-02-94379227;
e-mail dario.zerini@ieo.it

Received March 30, 2010;
accepted April 8, 2010.