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Megavoltage CT images of helical tomotherapy unit for radiation treatment simulation: impact on feasibility of treatment planning in a prostate cancer patient with bilateral femoral prostheses

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ABSTRACT

Metal prosthesis artefacts on CT images can be a significant problem in the definition of volumes of interest, dose calculation and patient setup in modern radiotherapy. We experienced considerable difficulties in defining the organs at risk and treatment volumes on kVCT images of standard CT simulation in a prostate cancer patient due to the presence of bilateral femoral prostheses causing artefacts. As shown in the current case, MVCT images of the patient in the treatment position obtained using a helical tomotherapy unit can provide sufficient morphological information to define the pelvic anatomic structures for radical prostate treatment planning. The patient completed the planned treatment and at 90 days after the end of treatment no severe side effects were recorded. Since there have been few reports on the use of MVCT images to overcome the problem of hip prosthesis artefacts, a brief literature review was also carried out.

Key words: MVCT, tomotherapy, prostate, planning, hip prosthesis.

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