VRIJE UNIVERSITEIT

Volumetric modulated arc therapy for stereotactic body radiotherapy:
Planning considerations, delivery accuracy and efficiency

ACADEMISCH PROEFSCHRIFT

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op gezag van de rector magnificus
prof.dr. L.M. Bouter,
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door
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geboren te Maleisië
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Volumetric Modulated Arc Therapy (VMAT) makes it possible to deliver IMRT using arc rotation techniques [22,23]. The dose rate and speed of gantry rotation may vary in addition to the MLC leaf positions throughout the delivery of therapy. The added variable relative to fixed-gantry IMRT introduces the need for special QA considerations when using VMAT. For example, QA procedures must guarantee that the dose rate, collimator leaf positions, and gantry angle are properly synchronized at each point in time. Leaf calibration and modeling are equally important for the VMAT dose-delivery technique. Comparison of volumetric modulated arc therapy with 3 other delivery techniques. Radiother Oncol 2010;97:437-42. Volumetric-modulated arc therapy for stereotactic body radiotherapy of lung tumors: A comparison with intensity-modulated radiotherapy techniques. Int J Radiat Oncol Biol Phys 2011;81:1560-7. [10] Jiang X, Li T, Liu Y, Zhou L, Xu Y, Zhou X, et al. Planning analysis for locally advanced lung cancer: Dosimetric and efficiency comparisons between intensity-modulated radiotherapy (IMRT), single-arc/partial-arc volumetric modulated arc therapy (SA/PA-VMAT). Radiat Oncol 2011;6:140. [11] Merrow CE, Wang IZ, Podgorsak MB. A dosimetric evaluation of VMAT for the treatment of non-small cell lung cancer A combonation of RAI therapy for RAI-avid lesions and local treatment for one or a limited number of RAI refractory lesions may be considered in certain patients. Progression despite Uptake of RAI Although most publications agree that progression is a criterion for RAI-R disease, huge variation exists in the definition of progression. Other radiation therapy devices for dose conformity. The improved dose conformity and steep dose gradients have necessitated enhanced patient localization and beam targeting techniques for radiotherapy treatments. The most critical component of radiation therapy treatment planning is the delineation of the gross tumour volume (GTV) [7]. Historically, anatomical cross-sectional images (mainly CT and in some instances MR) are used to delineate the treatment volumes [8, 9], and radiation treatment beams are planned to completely cover the treatment volume with the aim to deliver a uniform dose di