IMAGING

ERC impacts on prostate radiotherapy

MRI of the prostate is greatly enhanced by the use of an endorectal coil (ERC), which allows tumors to be localized and staged more accurately. A possible drawback of the ERC, however, is its effect on the size and shape of the prostate. According to Stijn Heijmink and his team at Radboud University in The Netherlands, these effects are significant and could have repercussions when determining target volumes for radiotherapy.

Researchers measured prostate dimensions using MRI at 3 T in 44 patients with biopsy-proven prostate cancer, before and after the insertion of an ERC inflated to 50 ml. Most dramatically, they found the anteroposterior diameter decreased by an average of 15.7%, while the right-to-left and craniocaudal diameters increased by 8% and 7%, respectively. The mean total prostate volume was considerably reduced from 50.4 cm³ to 42.2 cm³.

MRI scans are commonly integrated with CT images to get a more accurate picture of the prostate for radiotherapy planning. Clearly, any discrepancies in prostate size and shape will impact on the effectiveness of this process. An endorectal balloon (ERB), similar in volume to the ERC, can be used during CT scanning and treatment to resolve this

issue. However, the physiological effects of prostate compression by an ERC or ERB are unclear. The main concern raised by the authors is the effect on vasculature; a decreased blood volume in the prostate could cause hypoxia, which decreases the effectiveness of radiotherapy.

Interestingly, a compacted prostate may not be an entirely bad thing. "The volume of the prostate tissue that would need to undergo radiation would be smaller," suggests Heijmink, "and this would amount to a lower risk of adverse radiation therapy effects."

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Original article Heijmink, S. W. *et al.* Changes in prostate shape and volume and their implications for radiotherapy after introduction of endorectal balloon as determined by MRI at 3T. *Int. J. Radiat. Oncol. Biol. Phys.* **73**, 1446–1453 (2009).

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