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Comment on Hunt et al, "Feasibility of magnetic resonance guided radiotherapy for the treatment of bladder cancer"

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To the Editor:

We read with great interest the article written by Hunt et al. [1]. We encourage their efforts in sharing their initial experience of whole bladder magnetic resonance image-guide radiotherapy (MRgRT) using the 1.5 Tesla MR-Linac Elekta Unity (Elekta AB, Stockholm, Sweden). In their initial experience they emphasized that ultra hypofractionated radiotherapy (RT) was feasible and safe with acceptable toxicity profile. Their prospective study has now been extended to include radical patients receiving daily whole bladder RT to a total dose of 55 Gy delivered in 20 fractions. Current study is important, because to the best of our knowledge current study is the first one reporting the role of MRgRT for bladder cancer patients using ultra hypofractionated RT.

Muscle invasive bladder cancer patients who are unfit and unsuitable for standard radical treatment with cystectomy or daily RT present a large unfulfilled clinical need [2]. Hypofractionated RT can be an appropriate solution for these patients; however organ movement and changes in bladder filling is important obstacle for such treatment strategies. The only way to overcome this obstacle is that using online adaptive image-guided RT, wherein MRgRT is the state of art for the image-guided RT.

We have limited experience in using 1.5 Tesla MR-Linac Elekta Unity (Elekta AB, Stockholm, Sweden), since June 2020. The current interesting article encouraged us to treat a bladder cancer patient who is unsuitable for radical surgery or long-term chemo-radiotherapy (CRT) due to comorbidities. We have couple of concerns regarding this article, and the response to these concerns will be paving the way to MRgRT for the patients suffering from bladder cancer.

The dose constraints for planning target volume (PTV) was not mentioned clearly and there is a conflict between the manuscript and the supplementary material. The authors emphasized that the prescription dose (PTV D50%) was 36 Gy in six fractions delivered weekly; 30 Gy in five fractions was used for local symptom palliation in those with metastatic disease. Moreover, the acceptable clinical target volume (CTV) coverage was as defined 95% of CTV receiving >95% of prescribed dose. However in the supplementary material they defined the same constraint for PTV instead of CTV. We also calculated our patient's treatment plan using the dose constraints; however it is impossible to obtain the same value for both CTV, and PTV. Therefore we wonder the dose constraints for PTV as well.

Second, the bladder filling during the treatment period of MRgRT, which is relatively longer than conventional fractionation RT, as we experienced during prostate cancer patients treatment with MRgRT, is an important obstacle. Therefore we wonder how the authors did define the margins from CTV to PTV. As far as we can understand from the article that, they did not have any difficulty about bladder filling during the treatment. Because they emphasized that median intra-fraction CTV change (a surrogate for bladder filling as determined by change in volume between MRIsession and MRIpost) was 30 cc (range 2–82 cc). However they also underlined that the median CTV as determined on MRI session was 107 cc (range 60–243 cc). In the current valuable study no protocol was adopted for bladder preparation, therefore we wonder if the authors suggest us to do this. Third, during the treatment planning the authors used 2% per plan with respect to the statistical uncertainty. We wonder why the authors chose 2%, instead of 1%.

Last but not least, their prospective study has now been extended to include radical patients receiving daily whole bladder RT to a dosage 55 Gy in 20 fractions, as was mentioned in the article. We wonder the reason for choosing such dose extension. We consider that the authors' response to the above comments would clarify their interesting and valuable work. Clarification of the aforementioned issues will be helpful for a better understanding role of ultra hypofractionated RT using MRgRT for bladder cancer patients and will enlighten our future perspective.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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References

[1] Hunt A, Hanson I, Dunlop A, Barnes H, Bower L, Chick J, et al. Feasibility of magnetic resonance guided radiotherapy for the treatment of bladder cancer. Clin Transl Radiat Oncol 2020;25:46–51.

[2] Hafeez S, Patel E, Webster A, Warren-Oseni K, Hansen V, McNair H, et al. Protocol for hypofractionated adaptive radiotherapy to the bladder within a multicentre phase II randomised trial: radiotherapy planning and delivery guidance. BMJ Open 2020;10(5):e037134. https://doi.org/10.1136/bmjopen-2020-037134.