Australian First: Accelerated partial breast radiotherapy techniques with the Elekta Unity MR Linac

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About the Author

Jenna is the Senior Research RT at the Olivia Newton-John Cancer Centre in Melbourne. Her interests include person-centered care, breast radiotherapy techniques, MR in RT, particle therapy, CrossFit, and photography. She is a Fellow of ASMIRT and a member of the Targeting Cancer team.

Introduction

Early-stage breast cancer is the most common breast cancer presentation in Australia. The implementation of magnetic resonance guided radiotherapy (MRgRT) allows for real time soft tissue visualisation during treatment delivery, supporting safe and accurate accelerated partial breast irradiation (APBI).

Objectives/Aims

This presentation will discuss our experience with APBI utilising the Unity MR Linac.

Description/Methodology

Between April 2022 and January 2023, 15 patients (8 right and 7 left sided) have been treated with APBI on the Unity. 8 patients were treated in the supine position with the other 7 treated prone on a custom-made board. 13 patients were treated postoperatively with 30Gy in 5 fractions, the other two patients were treated preoperatively receiving a single 21Gy fraction.

Results

Treatment was delivered utilising 5 to 15 step and shoot IMRT fields with the adapt-to-position (ATP) and adapt-to-shape (ATS) workflows as appropriate for patient anatomy. The number of fields and angles varied with treatment position and tumour location. Careful attention was required to manage hotspots on the chest wall/lung interface for supine patients and in the skin rind in both positions, likely due to the electron return effect. Out of field dose due to electron streaming was also considered and accounted for. Treatments were typically delivered in under an hour.

Conclusion

The ability to see the target in real time and adapt accordingly is valuable. To a higher degree, the ability to irradiate patients in a single preoperative fraction decreases the burden of treatment (time, travel and associated costs) and allows treatment of a smaller portion of the normal breast tissue, which we can confidently achieve with MRgRT on the Unity.