

SIB – multiple simultaneous infield boost

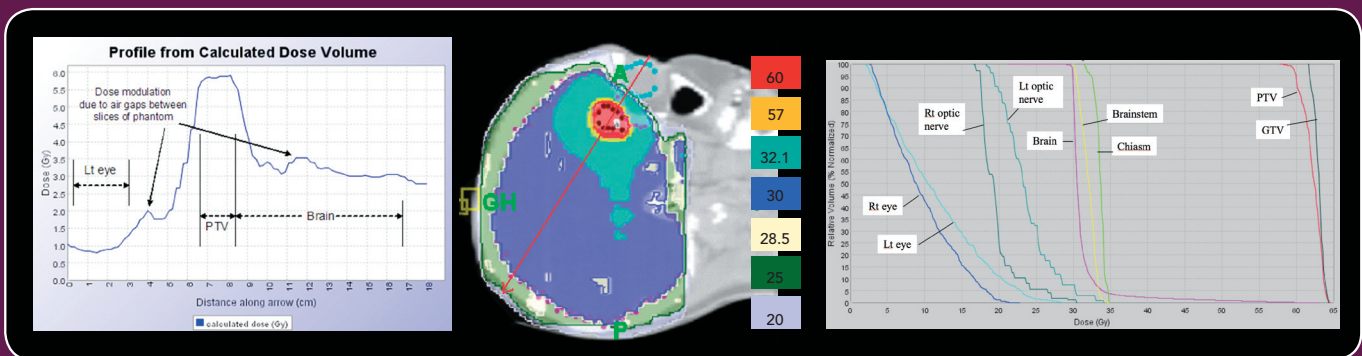
Abstract

Aggressive treatment of brain oligometastases may be associated with palliative and survival benefits in selected patients. We modeled the use of an imaged guided simultaneous infield boost (SIB) to individual metastases during a course of whole brain radiotherapy using helical TomoTherapy.

Whole brain radiotherapy to 30 Gy in 10 fractions was planned with SIB to individual lesions up to a total dose of 60 Gy in 10 fractions (isoeffective to a 18 Gy radiosurgery boost).

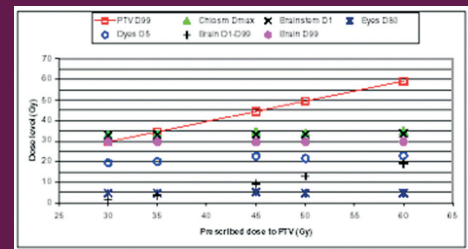
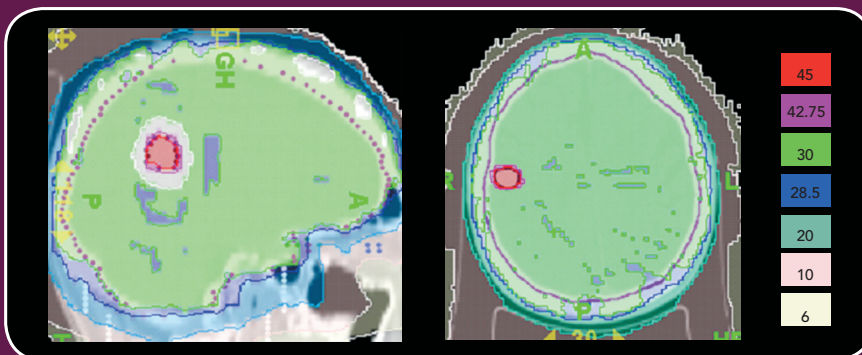
In all cases image guided helical TomoTherapy allowed dose escalation to the individual brain metastases to doses of 60 Gy in 10 fractions while maintaining critical structures within assigned normal tissue limits.

Case	Total #	Lesion 1 Location	Lesion 1 Size (cm ²)	Lesion 2 Location	Lesion 2 Size (cm ²)	Lesion 3 Location	Lesion 3 Size (cm ²)
Patient 1	2	L temporal	2.5	L frontal	1.2	–	–
Patient 2	2	L temporal	11	R parietal	1.0	–	–
Patient 3	1	L frontal	8.7	–	–	–	–
Phantom 1	2	L temporal	2.5	R parietal	4.1	–	–
Phantom 2	3	L temporal	2.5	R parietal	4.1	L occipital	2.5



Discussion

Based on this modeling exercise, the use of helical TomoTherapy to deliver a fractionated, frameless, stereotactic radiotherapy boost to individual lesions combined with whole brain radiotherapy appears feasible. A clinical phase I/II dose escalation trial to explore this treatment for patients with 1-3 brain metastases is underway at our institution.



Maintain OAR doses while escalating dose to metastases.

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Simultaneous Infield Boost with Helical TomoTherapy for Patients with 1-3 Brain Metastases: A Planning Study. G. Bauman MD, S. Yartsev PhD, B. Fisher MD, T. Kron PhD*; London Regional Cancer Program and Division of Radiation Oncology, University of Western Ontario, London, Ontario, Canada and *Peter MacCallum Cancer Centre, Melbourne, Australia

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