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abstract

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The Effectiveness of Standardizing the Threshold Range from 1cm to 0.5cm in Inter Fractional Motion Management and DIBH Stability for Breast Cancer Patients

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Introduction: This study assesses the efficacy of standardizing the threshold range from 1 cm to 0.5 cm in Inter-fractional Motion Management and Deep Inspiration Breath Hold (DIBH) stability for breast cancer patients. DIBH, a technique that involves patients inhaling to a specified level and holding their breath during radiation delivery, aims to minimize inter-fraction variation, thereby enhancing treatment accuracy.

Methodology: The methodology involved a retrospective review of 20 breast cancer patients across various disease stages, during which the potential benefits and capabilities of DIBH were evaluated during CT simulation. Selected patients were treated with 3D Conformal Radiotherapy (3DCRT), utilizing a surface monitoring system to ensure consistent DIBH positioning.

Results: Analysis focused on the vertical motion amplitude of the reflector block, comparing threshold ranges of 1 cm and 0.5 cm. Results indicated a mean vertical motion amplitude of 1.8 mm (1.4-1.8 mm) for the 1 cm threshold and 1.3 mm (1.2-1.3 mm) for the 0.5 cm threshold, revealing a relative decrease of 9%. The findings underscore significant dosimetric advantages

in employing a lower threshold, particularly for patients with left-sided breast cancer.

Conclusion: The study highlights that improved patient selection and training can facilitate effective DIBH practice, addressing respiratory-induced motion uncertainties in treatment delivery. While the reduction in threshold may extend treatment time due to additional breathing holds, the enhanced precision of irradiation justifies this adjustment. Overall, the standardization of DIBH thresholds offers a practical pathway to optimize treatment outcomes for breast cancer patients.

Conflict of interests: The authors declare no conflict of interests.

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