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A Single Center Experience of Phase-gated Lung Stereotactic Ablative Radiotherapy

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Abstract
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Abstract

Objectives:

A retrospective review of SABR lung patients was conducted to audit the use of phase-gated lung SABR at our centre.

Methods:

For patients who cannot achieve a reliable breath-hold technique, institutional policy mandates a motion management strategy when motion of GTV on 4DCT exceeds 5mm in any direction. For patients with < 5mm motion an ITV method is used with GTV contoured on all phases of the respiratory cycle to create a respiratory GTV denoted iGTV. If >5mm GTV motion exists in any direction a phase-gated approach is adopted with the gating window restricted to phases around end-expiration with < 5mm motion. A phase-gated GTV is contoured on each phase of the gating window to create an iGTV eg iGTV30-70. For mobile tumours a phase-gated approach reduces the PTV compared to the ITV method and may result in reduced risk of toxicity.

Results:

In our centre, 22 patients with either primary or metastatic lung cancer were treated between 2020 and 2022 using phase-gated lung SABR. The majority of these patients were treated using 2 VMAT FFF half-arcs, with only 2 patients requiring a 3-arc plan.

Conclusion(s):

A phase-gated approach provides an attractive method of reduction in the volume of the PTV.

A gated 4D-CBCT demonstrates a ‘like-for-like’ dataset, providing clarity in relation to online image review and reducing possibilities of mismatch, particularly in the longitudinal plane where mismatches can occur using the ITV method and standard CBCT.

Phase-gated lung SABR typically results in longer treatment sessions compared with free-breathing delivery.