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The application of lattice therapy in clinical radiation oncology

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High-dose GRID radiotherapy, sometimes termed spatially-fractionated GRID radiotherapy (SFGRT), is a treatment modality designed for the treatment of advanced bulky tumors. GRID therapy would induce a more rapid rate of tumor cell apoptosis in bulky, hypoxic, tumors than conventional dosimetric approaches. Indeed, dramatic clinical responses have been reported with GRID radiotherapy. GRID's application is limited by tumor location (only for superficial tumors). LATTICE therapy (LRT) is a 3D version of GRID which can create high dose islands within the tumor target with similar dose distribution and effects like brachytherapy with external beam radiation. LRT is not limited by tumor size and location due to its design to have a rapid dose fall-off outside these high dose islands, resulting in low-dose valleys within the tumor as well as low radiation dose outside of the target volume. *In vivo* data has shown that Single Fraction, High-Dose LRT Significantly Delayed Growth of Both Local and Distant Tumors. High-Dose LRT Induces Increased Secretion of Inflammatory Cytokines and abscopal effects in distant tumors untreated with LRT. Clinical data in LRT is promising, a patient with voluminous ovarian carcinosarcoma (size > 6 cm) was treated with LATTICE with excellent local control and no toxicity. LRT combined with chemotherapy for the treatment of the large recurrent ovarian mass in this patient was very well tolerated. In a small group of cancer patients treated with IMRT and LRT (18Gy) as a boost, 75% patients achieved a PR, LRT was well tolerated in this group of patients. Abscopal effects, GRID, Lattice, Radiation.

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