

Lattice Radiotherapy (LRT): Case Report of Bulky Cervical Cancer (CC)

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Abstract

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Abstract

Objective: To report LRT our clinical experience for the treatment of advanced bulky CC.

Methods: LTR is a technique of delivering inhomogeneous doses of radiation to bulky tumors, with a maximum dose (V2%) of 15 Gy in a single fraction in at least 4 points (vertices) inside the GTV, and with low doses between vertices. Treatment is delivered in one-day followed by daily conventional fractionation. Target volumes were GTV, CTV, PTV and RVR (Remaining Volume at Risk) but we also considered Lattice specific volumes as LTV (Lattice Tumor Volume), VTV (Vertices Tumor Volume) and VV (Valley Volume). LTV was defined inside the GTV excluding certain critical structures as ureters. The VTV contour is a set of 1 cm spheres placed into the LTV with a minimum of 4. The main inclusion criteria in our protocol was GTV greater than 45 cc, secondary criteria were unresectable tumor, inoperable patients or unfit patient for exclusive systemic therapy. A Lattice boost of 15 Gy was delivered within the first five days of planned radiation treatment. Volumetric-arc-therapy (VMAT) irradiation technique with daily Cone-Beam CT (CBCT) was used in all patients to achieve the prescribed total dose.

Between November 2019 and September 2020, 2 patients with CC stage IV FIGO squamous cell carcinoma (SCC) have been treated. Both patients were young (42 and 51 years), had T4 (with bladder-ureteral invasion) N0M0 and T4N1M0, VPH+ and were staged with clinical evaluation, CT, MRI and PET scan. Other clinical and dosimetric characteristics are shown on table. In both cases the treatment regime included: platinum based chemotherapy concomitant with external beam radiation (EBRT). Posterior brachytherapy boost in 2 applications was delivered with HDR intracavitary-interstitial technique (EMBRACE protocol) in both.

Results: Our preliminary results in these 2 patients with bulky CC shows that LRT was well tolerated in all patients. With a follow up of 5 and 14 months both patients have complete response, both patients are alive and free loco-regional disease (100% local control). 1 of the patients had lung surgery due to pulmonary metastasis 12 months after local treatment and is currently receiving systemic treatment; the other patient is receiving immunotherapy without evidence.

Conclusion: Our experience is consistent with the published literature. It shows feasible to apply LRT to Bulky CC and can be integrated in a standard treatment with chemotherapy and brachytherapy. This early experience shows good response and no added toxicity. However, more investigation is needed to confirm these promising preliminary outcomes.