abstract

Spatially Fractionated Grid Radiotherapy: Experience At Inmol Hospital

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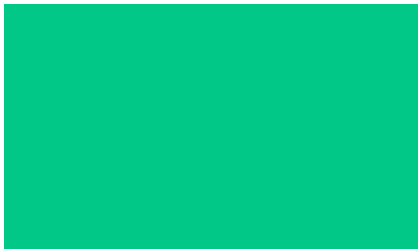
Spatially Fractionated Grid Radiotherapy: Experience At Inmol Hospital

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Introduction: Spatially Fractionated Radiotherapy (SFRT) is known for its highly potent immunomodulated response that contributes to its highly effective outcomes. This makes SFRT one of the few promising treatment options for conquering tumors, especially in locally advanced cases in a palliative setting for symptomatic controls. It used a novel and practical volumetric modulated arc therapy (VMAT) planning approach for grid therapy This study aims to report our early experiences of using SFRT for patients with various cancers in our hospital.

Methodology: Dose is prescribed to 1.5-cm diameter spherical contours placed throughout the gross tumor volume (GTV). Placement of spheres is variable, but they must maintain at least a 2cm (center to center) separation, and the edge of any sphere must be at least 1 cm from any organ at risk (OAR). Three concentric ring structures are used during optimization to confine the highest doses to the center of the spheres and maximize dose sparing between them. A dose of 20 Gray (GY) is planned and delivered to each sphere while keeping the dose to the rest of the CTV up to 10 GY. The result was set the alternating regions of high and low dose throughout the GTV and minimal dose to OARs. High-intensity flattening filter-free (FFF) modes are used to efficiently deliver the plans, and entire treatments typically take around 35 minutes.

Results: A total of 4 patients with various cancer types were treated using SFRT, with a median age of 47.5 years old males, 2 cases of sarcoma, 1 case of mediastinal lymphoma, and 1 case of chordoma. The approach is illustrated with 4 examples treated at our institution. The 1st patient had a 2203cm³ mediastinal mass and was prescribed 20 GY to 24 spherical regions within the GTV. The 2nd had a 3680-cm³ chordoma and was prescribed 20 GY to spherical regions within the GTV. The 3rd case was a chondrosarcoma 1555cm³ of the thigh, and the 4th patient had soft tissue sarcoma of the gluteal region 2740cm3. All patients received additional consolidative radiation approximately 1 week after the initial VMAT grid treatment. Each patient experienced a marked reduction in tumor size and symptomatic relief without treatment related

complications. All cases were palliative in intent, aimed at pain relief, bleeding control, or bulky mass reduction.

Conclusion: SFRT shows promising results in terms of tumor response, especially for bulky tumors. Proper utilization of SFRT can improve tumor response. Additionally, no significant toxicities were found in all of our patients. As many centers offer VMAT treatments, the approach is widely accessible and can be readily implemented once appropriate patient selection and delivery processes are established.