

## Standardizing and Achieving Protocol Objectives for ChestWall Radiotherapy Treatment Planning Process using an O-ring Linac in High-, Low- and Middle-income Countries

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**Abstract :** Purpose: Radiotherapy departments in low- and middle-income countries (LMICs) like Guatemala have recently introduced intensity-modulated radiotherapy (IMRT). IMRT has become the standard of care in high-income countries (HIC) due to reduced toxicity and improved outcomes in some cancers. The purpose of this work is to show the agreement between the dosimetric results shown in the Dose Volume Histograms (DVH) to the objectives proposed in the adopted protocol. This is the initial experience with an O-ring Linac. Methods and Materials: An O-Linac Linac was installed at our clinic in Guatemala in 2019 and has been used to treat approximately 90 patients daily with IMRT. This Linac is a completely Image Guided Device since to deliver each radiotherapy session must take a Mega Voltage Cone Beam Computerized Tomography (MVCBCT). In each MVCBCT, the Linac deliver 9 UM, and they are taken into account while performing the planning. To start the standardization, the TG263 was employed in the nomenclature and adopted a hypofractionated protocol to treat ChestWall, including supraclavicular nodes achieving 40.05Gy in 15 fractions. The planning was developed using 4 semiarcs from 179-305 degrees. The planner must create optimization volumes for targets and Organs at Risk (OARs); the difficulty for the planner was the dose base due to the MVCBCT. To evaluate the planning modality, we used 30 chestwall cases. Results: The plans created manually achieve the protocol objectives. The protocol objectives are the same as the RTOG1005, and the DHV curves look clinically acceptable. Conclusions: Despite the O-ring Linac doesn't have the capacity to obtain kv images, the cone beam CT was created using MV energy, the dose delivered by the daily image setup process still without affect the dosimetric quality of the plans, and the dose distribution is acceptable achieving the protocol objectives.

**Keywords :** hypofractionation, VMAT, chestwall, radiotherapy planning

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