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Clinical implementation of intracranial stereotactic radiotherapy with non dedicated linear accelerator in a developing country: the cuban experience

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Purpose: To introduce stereotactic treatment performed with a general purpose LINAC for brain lesions management.

Methods and Materials: Between April 2008 and august 2016, 35 patients underwent SRS (26) and SRT (9). The patients'average age was 51 years old. The indications were: primary treatment in 21 cases (10-meningiomas; 8-schwanomas; 1-ependymoma; 1-pineal germinoma; 1-glomus) and 14 cases as post- whole brain radiotherapy (5-breast, 7-lung, 1-nasopharingeal and 1-colon brain metastases). Stereotactic treatment was delivered with 6MV general purpose LINAC. The techniques used were dynamic non-coplanar arcs with micro-multileaf collimator for 27 patients and non coplanar arcs using cones for other 4 patients. The treatment planning systems used were Elekta Ergo ++ and Elekta Monaco version 5.0. In the case of benign tumors, the average dose prescribed was 16 Gy (range, 13-17 Gy) for single fraction SRS and 8 Gy for 2 sessions of SRT. In the case of metastatic lesions, the average dose was 18 Gy (range, 16-19 Gy) for single fraction SRS and 7Gy for 3 sessions of SRT. In all cases the prescription selected curve was the 90% of the dose distribution. Plans were evaluated using: target coverage, conformity index (CI), homogeneity index (HI) doses in critical structures, in planning target volume (PTV).

Results and Conclusions: Both treatments (SRS / SRT) were well tolerated. The assessed parameters were in agreement with the international reported levels, taking into account our technology and expertise. The multidisciplinary team, showed their capability of successfully handling these treatments.

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