

AbstractID: 3853 Title: The Feasibility of Using Tomotherapy Hi-Art Machine for Stereotactic Radiosurgery.

Purpose: To study the feasibility of treating multiple-brain metastases with stereotactic radiosurgery using the tomotherapy Hi-Art machine, and to compare tomotherapy stereotactic radiosurgery treatment plans with conventional linac-based stereotactic radiosurgery plans.

Material and Method: Five previously treated patients with multiple brain metastases ranging from 1 to 5 metastases were selected for the study. These five patients were treated with linac stereotactic radiosurgery. The same structures and prescription doses used for linac radiosurgery were also used to produce stereotactic radiosurgery treatment plans on the tomotherapy planning system. In order to compare the tomotherapy plans to the linac-based plans, the homogeneity of the target volumes, as well as the PITV, the volume of normal brain tissue receiving at least 10Gy and treatment time were considered.

Results: Analysis of the five plans shows that the target dose uniformity, target dose conformality, and the treatment time for each plan is much improved for tomotherapy. The plans show that on average using tomotherapy planning system increases the dose uniformity by 70%, increases the target-dose conformality by 42% while it reduces the normal tissue volume receiving at least 10 Gy by about 40% for large metastases. On the other hand, for metastases smaller than 1cc tomotherapy increases the 10.0 Gy volume over that for a conventional linac plan by about 60%.

Conclusion: These results show that tomotherapy could be used for treating patients with multiple brain metastases using stereotactic radiosurgery.