

AbstractID: 6533 Title: Hair Sparing IMRT for Whole Brain with Simultaneous Integrated Boosts

Purpose:

To investigate inclusion of the hair-sparing limitation of scalp dose as a secondary objective in a protocol for whole brain IMRT treatment along with high dose simultaneous integrated boosts (SIB) added to help control gross brain metastases.

Methods and Materials:

Three patients were selected to simulate a variety of brain tumors using artificial GTVs. The target doses were 54 Gy or 45 Gy for the boosts, and 27 Gy for the remainder of the whole brain, in 15 fx. To implement hair sparing, a 5 mm thick hair shell within the patient contour was created. Typical planning objectives for the hair shell were a max DVH constraint of 1250 cGy to 50% volume, and a max dose objective of 2300 cGy. Planning was done using Phillips Pinnacle³ (V7.4f) software configured for step-and-shoot treatment on a Siemens Primus unit with 6-MV photons.

Results:

The high-dose boost regions were found to require at least 5 beams but did not substantially degrade the whole brain DVH or hair DVH. However, for a PTV near the surface it was not possible to keep the hair dose low. The DVH may appear acceptable in such cases, but dose on the inner side of the 5 mm region will not cause hair loss, while a patch of high dose on the surface will.

Conclusions:

IMRT can provide a clinically viable avenue for hair-sparing whole brain treatment with SIB to higher primary tumor doses. A specific region of interest that would represent the "hair sparing" region might need to be defined and be assigned a specific dose limiting objective during the optimization process. We found that hair-sparing cannot successfully be satisfied for primary targets situated closer to the surface.