Supplementary:

The following supporting information can be downloaded at: www.mdpi.com/xxx/s1, Figure S1: Tumor volume and valley dose coverage with depth.

Figure S1 shows the valley depth dose curves compared to the average 9LGS tumor volume variation with depth of each treatment group in Table 1 (except group 5 at 13.8 Gy). When including the 5 mm bolus, the valley dose plateau is shifted to cover the entire tumor volume of the group 3 and 6 animals which improves the valley dose consistency (shown in Figures S1A and S1B, respectively). Without the bolus, the superior portion of these tumors (<5.5 mm depth) would receive less dose than the desired target doses of 8 and 15 Gy. Note that for programs 3 and 6, the bolus was in place for treatment. Tumors that were treated with programs 2 and 5 (with no bolus) were subject to the limited valley dose coverage (in Figures S1C and S1D, respectively), and expected to have reduce survival for some individuals.

There are also differences in the valley dose build-up and plateau between MRT irradiation conditions due to beam energy. The 3T spectra (81 keV mean energy) produced an earlier valley dose build up (within 7 mm) and plateau to 12 mm depth, compared to the 4T spectra (with 58 keV mean energy) that produces a build-up within 10 mm, and plateau until 13 mm. The choice of MRT beam energy therefore can be used to further adjust tumor coverage.

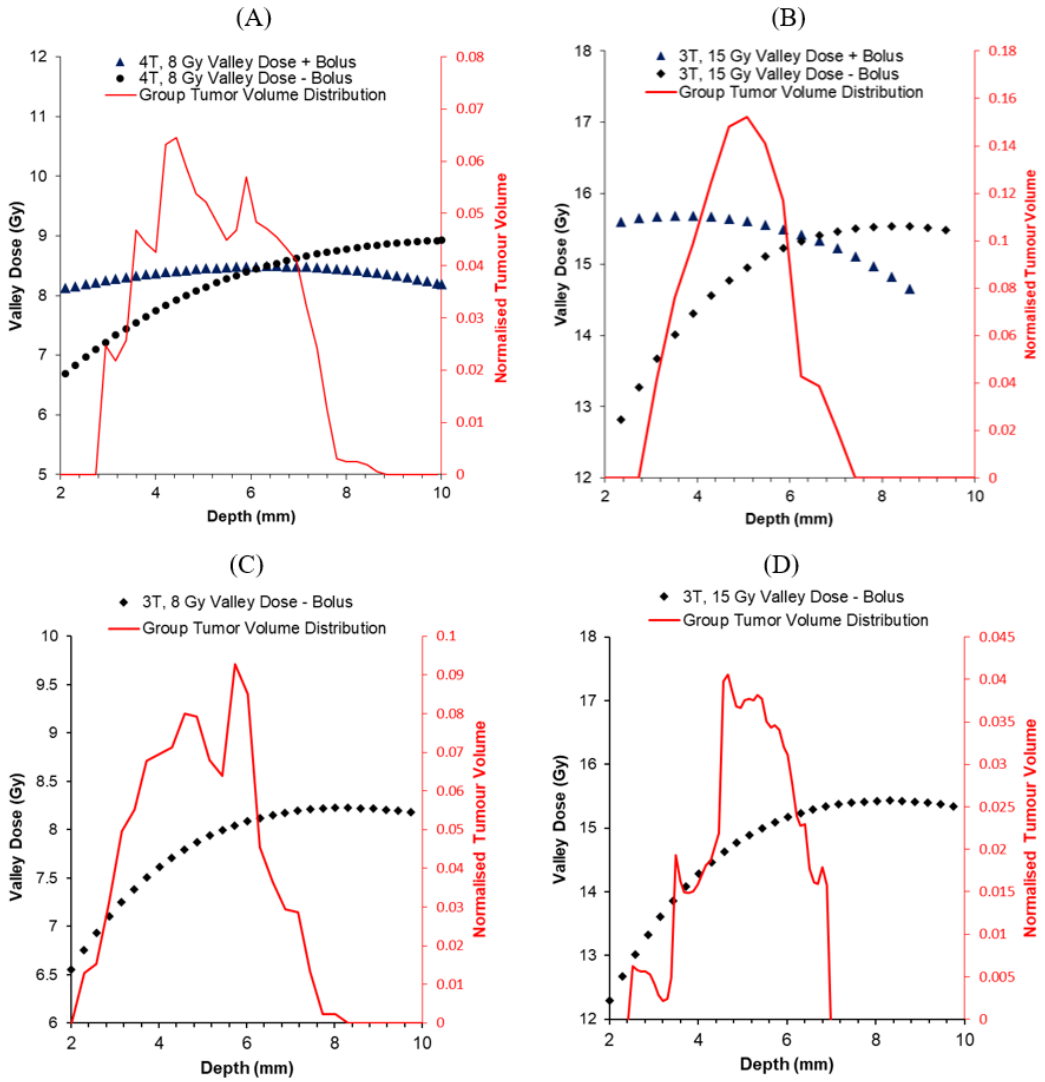

Figure S1. Tumor volume and valley dose coverage with depth. The average tumor volume of individuals treated with MRT program 3 (8 Gy, 4T) (A), and program 6 (15 Gy, 3T) (B) in Table 1 are compared to the valley dose variation with respect to depth in the brain, with and without a bolus. The average tumor variation with depth for 8 Gy 3T (C) and 15 Gy 3T (D) cohorts without a bolus in programs 2 and 5, respectively, are also compared to the valley dose depth dependence for the standard target dose depth of 5.5 mm in the brain.