Purpose: Sparing brain volume is the goal when designing plans for multiple brain tumors. We compared dose distributions for tumor and normal tissues using VAMT and static IMRT.

Methods: A patient presented with recurrent meningioma with 4 lesions identified. The greatest dimensions for the tumors were 0.4 to 2.0 cm. The tumor sizes and locations can be treated with a single plan with 1.8 Gy/fraction, 30 fractions. A 6-field non-coplanar IMRT with the gantry(G) and couch(C) in IEC scale were used: G0C0, G45C0, G330C0, G240C0, G50C90, and G120C90. IMRT was performed using iPlan sliding-window. For VMAT, four arcs were used; two using 350 degree from G175 to G185 and the other two using 175 degree from G0 to G175. Two arcs were designed with couch=0 and the rest two using couch=90 degree. VMAT was designed with Eclipse system. Tumors and normal brain were contoured in the iPlan and then exported to Eclipse to maintain identical volume. DVH for normal brain was compared for the same tumor coverage from the two plans.

Results: Either static IMRT or VMAT generated an acceptable coverage for these four tumors. The conformity of tumor coverage was better in VMAT than that using IMRT; the range of min.-max. doses were: 57.5-63.5 Gy from VMAT vs. 54.1-64.9 Gy from IMRT. For normal brain, DVH did not show a clear difference between the two plans. For doses 5-15 Gy, VMAT delivered 1-10% more brain volume (1040 cc) but 1-2 % less volume in 30-40 Gy than that from static IMRT.

Conclusions: Either static IMRT or VMAT can adequately be used to treat multiple lesions with a single isocenteric treatment. VMAT plan demonstrated improved tumor coverage, spared 1-2% brain tissue at 30-40 Gy but irradiated up to 10% more brain in 2-7 Gy. The patient was treated with VMAT.