

Supplementary Material 2

Image Analysis

For each patient, ANTs was used to perform the following: 1) a linear, forward transformation from preoperative to postoperative T1-w images, and 2) a non-linear, inverse transformation from T1-w to AP images with b-spline as the deformation model.

3D Slicer version 4.3 (NA-MIC©, <http://www.slicer.org>)¹ was used to create regions of interest (ROIs) that measured 2x2 voxels on DWI. ROIs were bilaterally placed at three anatomical locations along the trigeminal nerve: 1) the radiosurgical target, 2) the REZ, and 3) proximal pontine segment (PPS).

The ipsilateral ROI at the centre of the target was determined using Elekta GammaPlan™. A contralateral ROI was placed at a similar distance from the REZ. The ROIs at the REZ were placed at the junction between the cisternal segment and pontine brainstem. The ROIs at the PPS were placed on the proximal pontine segment of the trigeminal nerve, overlying MS plaques if present.

Using the ROIs, diffusivity metrics were extracted from the tractography models, rather than the scalar maps, to minimize contamination of nearby structures. The ROIs at the PPS were also used to extract MM intensities directly from the scalar MMs.

Reference

1. Pieper S, Halle M, Kikinis R, et al. 3D slicer. In: Proceedings of the 2nd IEEE international symposium on biomedical imaging: Nano to macro (IEEE Cat No 04EX821), Vol. 1, Arlington, VA, 18 April 2004, pp. 632–635. New York: IEEE.