

Purpose: The purpose of this study was to develop a cone-shape phantom for multi-voxel magnetic resonance spectroscopy (MRS) and to evaluate MR spectra using the cone-shape phantom we developed in this study.

Method and Materials: A cone-shape MRS phantom was developed with a combination of cone-shape vials. The cylindrical main body was made of acrylic resin and the cone-shape vials were fabricated from poly-ethylene cones. Each cone of the phantom was filled with various metabolite materials (The solution mimicked human brain). 1.5T GE and 3T Philips systems were used for the single voxel spectroscopy (SVS) as well as for the multi-voxel spectroscopy (MVS). Identification and quantification of the metabolite materials in the cone-shape phantom were done by the SAGE post-program.

Results: The MR images and spectra of the cone shape phantom were obtained from the assigned slice position. The high order shimming control provided enhanced resolution in the SVS and MVS. The area and amplitude were proportional to the metabolite volume in the voxel. We confirm that the analyzed results are reasonable and the present study demonstrated that the cone-shape phantom was useful for the metabolite quantification.

Conclusion: We propose that the cone-shape phantom can be used for the evaluation of quality control of the MR spectra obtained from SVS and MVS.

Conflict of Interest (only if applicable):