

Purpose

To modify the assigned optimization of acquisition parameters for precise measurement of diffusion in anisotropic systems.

Materials and Methods

Diffusion weighted MR data were acquired from healthy volunteer, using 1.5T Siemens Avanto (Siemens, Erlangen, Germany) with actively shielded magnetic field gradients (maximum amplitude, 40mT/m). The parameters for optimal schemes were derived for each measurement based on the estimated mean diffusivity and T2 measurements. Data were analyzed on an independent workstation (Pentium IV, 3.2 GHz CPU). The diffusion weighted images were corrected for gradient tables and ECC using DTI Studio software (Radiology, Johns Hopkins University, SOM).

Results and Conclusion

Each individual measurement of D_{xx} , D_{yy} , and D_{zz} can be optimized in the way as with optimal diffusion weighting the x , y , z , and other index. The more precise assessment of $Tr(D)$ is needed, the more measurements should be made. In our study, consider the variances of each of the unique elements of the diffusion tensor.

Acknowledgment

This study was supported by a grant of the Seoul R&BD Program, the Korea Health 21 R&D Project, Ministry of Health & Welfare, Republic of Korea. (02-PJ3-PG6-EV07-0002) and a grant of the 2005 Nuclear R&D Plan Program, Ministry of Science & Technology, Korea.

References

1. Jones D.K., Horsfield M.A., Simmons A. Magn Reson Med 1999;42:515-525
2. Westin C.F., Maier S.E., Mamata H. et al Med. Im. Anal. 2002;6:93-108
3. Melhem E.R., Mori S., Mukundan G. et al AJR 2002;178:3-16