

学位論文抄録

Fundamental and clinical studies of 4D contrast-enhanced MR Angiography
for the evaluation of brain and neck lesions
(頭部・頸部病変の診断における四次元造影MR血管撮影の有用性の基礎的及び臨床的研究)

西村振一郎

熊本大学大学院医学教育部博士課程医学専攻放射線診断学

指導教員

山下 康行 教授

熊本大学大学院医学教育部博士課程医学専攻放射線診断学

Abstract of the Thesis

Background and Purpose: The optimal keyhole technique for four-dimensional (4D), time-resolved contrast-enhanced MRA (4D-CE-MRA) at 3T and systematic investigation of brain- and head and neck lesions with this method have not been reported. The purposes of this study were to determine the optimal keyhole condition of this technique, and to compare the agreement between digital subtraction angiography (DSA) and 4D-CE-MRA for the evaluation of intracranial dural arteriovenous fistula (DAVF) and hypervascular brain and head and neck tumors (HBHNT).

Materials and Methods: In a phantom study, keyhole percentage was changed from 15, 30, 40, 60, 80, and 100%. Seven observers evaluated the 4D-CE-MRA images for image quality. In the clinical studies, 18 patients with intracranial DAVFs and 15 patients with HBHNT were included. Two radiologists independently reviewed the 4D-CE-MRA and DSA images.

Results: The mean score of the keyhole percentage of 100% was significantly higher than that of 15% and 30%. The image quality of the keyhole percentage of 15% and 30% was fair, not interfering with interpretation. In the DAVF study, interobserver agreement for 4D-CE-MRA was fair for the main arterial feeders, excellent for the fistula site, and good for venous drainage. Intermodality agreement was moderate for the main arterial feeders and excellent for the fistula site and venous drainage. In the HBHNT study, the interobserver agreement for 4D-CE-MRA was fair with respect to the main arterial feeders and very good for the degree of tumor stain. Intermodality agreement was moderate for the main arterial feeders and good for the tumor stain.

Conclusion: The keyhole percentage affected the image quality of 4D-CE-MRA. The adequate keyhole percentage should be selected according to the temporal and spatial resolution needed. Although 4D-CE-MRA may be useful for diagnosing DAVF and HBHNT, it is not able to replace DSA.