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Demonstration of improved surgical outcome in patients with both ACTH and GH secreting adenomas diagnosed by a new sensitive method of MET-PET fusion 3T-MRI

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Abstract

Aim: Early diagnosis and treatment is important both in Cushing's disease and Acromegaly. The aim is to clarify the improvement of surgical results by early diagnosis using a new sensitive method of [^{11}C] methionine-positron emission tomography (MET-PET) fusion 3T-MRI.

Materials and Methods: Endocrinological examination suggested abnormal secretion of ACTH or GH in all cases. The pituitary tumors were investigated by composite 3T-MRI and MET-PET imaging. High MET uptakes in the pituitary region were regarded as pituitary adenoma. 30 patients with Cushing's disease who had examined MET-PET included in this study. Surgical cure rate of Cushing's adenomas which were not detected by conventional MRI were evaluated, and the results were compared with the previous report. 120 GH secreting adenomas, including 95 patients with typical acromegaly and 25 patients with no apparent clinical features of acromegaly (pre-Acro), were evaluated. Surgical cure rate was compared between patients with Acromegaly and pre-Acromegaly.

Results: Diagnostic accuracy of the localization of Cushing's disease was 100%. The overall cure rate of 22 Cushing's diseases which were not detected by 3T-MRI but were diagnosed by MET-PET fusion 3T-MRI was 100%. This result surpasses the reported surgical cure rate of 50-70% in Cushing's adenomas which were not detected MRI. The surgical cure rate for acromegaly and pre-acromegaly was 65% and 100%, respectively. Patients with pre-acromegaly had a better surgical cure rate relative to patients with typical acromegaly.

Conclusion: Early detection of both ACTH and GH secreting adenoma is important since early surgical intervention can achieve a perfect cure rate.

Biography

1981: Graduated from Tohoku University School of Medicine, Sendai, Japan and obtained M.D. 1987: graduated from Tohoku University Graduate School of Medicine and obtained Ph.D. 1988 Assistant Professor, Department of Neurosurgery, Tohoku University School of Medicine, Sendai, Japan. 1992.4-1992.11 visiting scientist at Department of Neuropathology, University Hospital, Zurich, Switzerland 1992.12-1993.4 visiting scientist at Department of Molecular biology, Harvard Medical School, Boston, USA 1998-2003.9 Lecturer, Department of Neurosurgery, Tohoku University School of Medicine 2003.9-2005. Chief director, Dept. of Pituitary surgery, Kohnan Hospital, Sendai, Japan 2008.7- Head of Research Institute for Pituitary disease. Southern Tohoku General Hospital, Koriyama, Japan