Introduction: Subjects with MCI are at high risk for Alzheimer's disease (AD), although some do not develop AD or may even improve. Diffusion Tensor Imaging (DTI) is a sensitive technique that can detect microstructural change in the white matter and, in AD and MCI, decreased fractional anisotropy (FA) was found in several white matter regions. In these regions, the Unciate Fasciculus (UF) is an important structure that connects the anterior part of the temporal lobe with the frontal lobe. However, it is unclear whether the degree of the UF change in MCI is related to the prognosis of AD.

Aim: To investigate changing UF of aMCI patients, and evaluate prognosis of onset of AD after 3 years, using DTI data.

Method: We analyzed DTI data of 30 patients with aMCI in baseline. We divided patients who converted to Alzheimer disease and nonconverters after 3 years follow-up. The FA of UF in two groups was compared using DTI data of baseline.

Result: The averaged FA value was significantly lower for AD patients than aMCI in baseline (p< 0.05). Linear classification of the patients allowed an automatic diagnostic with a reasonable leave-one-out generalization error (23.3%), with a sensitivity of 80.0% and a specificity of 73.3%, and a ROC AUC of 0.73.

Conclusion: These result indicated that FA of UF for AD patients decrease in early stage of disease. This study provides evidence that the decrease of FA of UF might be able to apply to early diagnosis of AD for aMCI.