

# NPH vs. Alzheimer's disease: Cerebral Spinal Flow Imaging

## Definition

Alzheimer's disease and normal pressure hydrocephalus (NPH) can have similar symptomatic manifestations. Memory loss, gait disturbance and incontinence are common to both processes and can be difficult to differentiate with current imaging techniques.

## History

An 84-year-old patient was referred to MRI complaining of difficulty expressing words and thoughts along with memory loss. Referral requested an MRI of the brain with and without contrast for NPH. The patient denies any trauma, headaches or dizziness.

## Technology

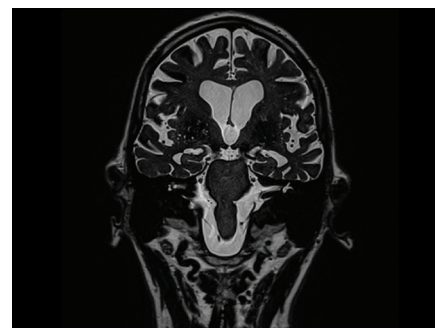
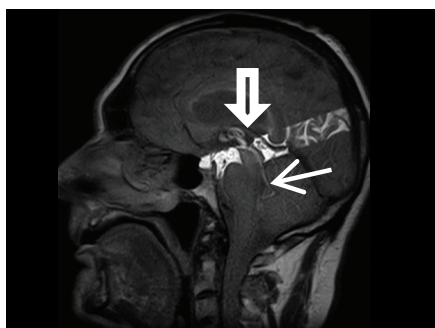
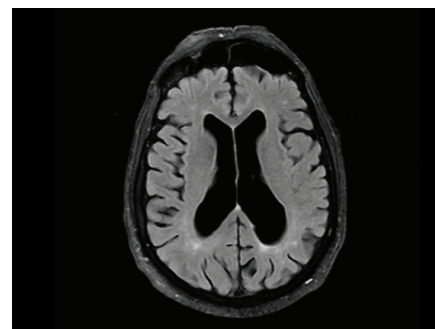
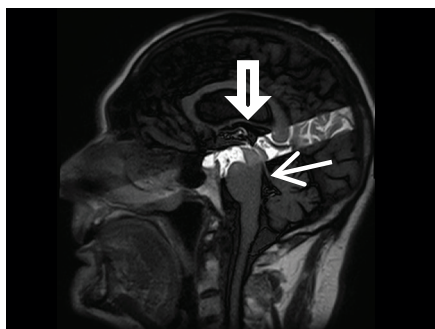
Toshiba 3T Titan MR System with M-Power software interface and neurovascular coil configuration was used. Using the exclusive Toshiba Time-Slip technique, we are able to visualize the movement of CSF within the brain. This new imaging tool enables the radiologist to watch flow or the absence of flow to determine if the patient might benefit from a shunting procedure.

## Findings

The images display generalized atrophy and ventricular prominence with focal volume loss around the parahippocampal structures suggestive for Alzheimer's-type dementia.

## Conclusions

Diffuse sulcal, gyral and ventricular prominence. Hippocampal atrophy noted bilaterally. These findings may be related to an Alzheimer's-type dementia pattern. A PET study may be helpful for further evaluation if indicated. No intracranial hemorrhage or intracranial tumor. MR findings appear stable when compared to the previous study of six years ago. There does appear to be some hyperdynamic flow through the third ventricle. (*Large arrow*) The aqueduct and the fourth ventricle also have flow within the structures. (*Small arrow*) This finding is seen with normal pressure hydrocephalus. Clinical correlation is suggested. There is also diffuse cortical and deep atrophy as previously described with hippocampal atrophy, which is also seen with Alzheimer's-type dementia pattern. Noted is the absence of CSF flow into the lateral ventricles suggesting the possibility of NPH. (*Red arrow*)



The above two-panel sets are individual images taken from a cine series that was acquired over a 10-20 second period that demonstrates the movement of CSF.

Axial and coronal images were acquired to visualize the level of atrophy within the lateral ventricles.