



# Quantitative Hippocampal Volumetric Measures as Predictors of Cognitive Response to CSF Shunting in Patients with Normal Pressure Hydrocephalus

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## Learning Objectives

By conclusion of this session, participants should be able to: 1) Describe the importance of volumetric measurements in predicting cognitive outcomes following CSF shunting of NPH patients 2) Consider using volumetric measurement of HV when counseling patients about possible surgical outcomes of shunting

## Introduction

NPH is a reversible cause of dementia and gait dysfunction in the elderly. High volume lumbar drainage has been used to select patients for shunting. Predicting likelihood of cognitive improvement is challenging in this population. The authors considered whether hippocampal volumes (HV) are predictive of cognitive outcomes following shunting.

## Methods

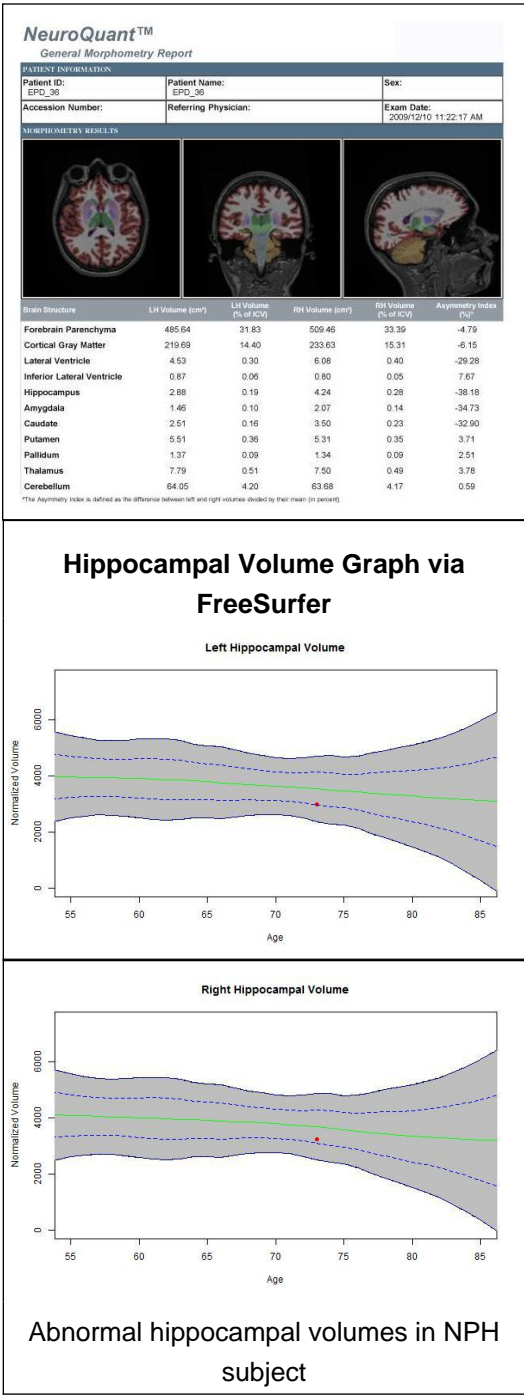
Patients with NPH who underwent VP shunt placement were retrospectively reviewed to consider HV as a predictor of clinical outcome. Assessment of HV was performed using volumetric measures derived from NeuroQuant and FreeSurfer. Measurements of cognitive and gait function prior to and following CSF diversion were assessed per our clinic standard. Patients were stratified based upon presurgical HV. Clinical outcomes were compared within the two groups

## Results

22 patients underwent VP shunt placement for NPH between May 2012 and November 2013 and had preoperative MRI with volumetric measures. 16 patients had abnormal HV (<1st percentile ADNI classification); 6 had normal HV. 4 patients with abnormal HV (25%) demonstrated cognitive improvement and 12 (75%) demonstrated no improvement or cognitive decline following shunting. 5 patients with normal HV (83%) demonstrated cognitive improvement and 1 (17%) demonstrated no improvement or cognitive decline. HV was associated with cognitive response to shunting (p=0.013). 9 patients with abnormal HV (56%) demonstrated improvement in gait and 7 (44%) demonstrated no improvement or a decline in their gait symptoms. 5 patients with normal HV (83%) demonstrated improvement in gait and 1 (17%) demonstrated no improvement in gait following surgery. This did not suggest a correlation between HV and gait improvement following shunting (p=0.23).

## Conclusions

It is challenging to predict patients’ cognitive response to shunting for NPH. This preliminary analysis suggests that preoperative HV can help predict cognitive improvement. This suggests a benefit to further prospective assessment of HV as an imaging marker in NPH



## References

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