

Introduction

Selecting patients with hydrocephalus who might benefit from shunt surgery is challenging. Current methods such as external lumbar drainage (ELD) requires in-patient monitoring for three to four days and exposes patients to unnecessary risks. In this prospective study we utilize specialized objective gait measurements to assess if a two-day outpatient lumbar tap trial can reliably predict shunt responsiveness.

Methods

Forty-two patients with suspected communicating hydrocephalus were diagnosed based on a history and physical exam, the presence of gait dysfunction, and ventriculomegaly on imaging. Work-up was performed by a neurosurgeon and a physical therapist who specializes in gait abnormalities. Timed walk (TW), timed up and go (TUG), and timed up and go with a cognitive distractor (TUGD) measurements were obtained immediately before and after high volume CSF diversion. Repeat measurements were obtained on post-tap day two. Patients who demonstrated pre-defined improvements in times were offered a shunt. Within one month of shunt surgery patients returned for follow-up evaluation.

Results

Twenty-three patients responded positively to the LTT and underwent a shunt procedure. On post-tap day two the percentage of patients demonstrating improvement from immediate post-tap measurements was greater among LTT responders (79% vs. 78% in TW, 79% vs. 44% in TUG, and 74% vs. 67% in TUGD). Degree of improvement during the same interval was also greater among LTT responders (7.71% vs 5.45% in TW, 7.69% vs. -6.18% in TUG, and 4.37% vs. -12.85% in TUGD). After shunt surgery nineteen patients (95%) experienced improvements in gait with a mean reduction of 30%, 26%, and 34% in TW, TUG, and TUGD, respectively.

Conclusions

A two-day outpatient LTT can more reliably select patients with communicating hydrocephalus who might benefit from shunt surgery by assessing timed gait measurements on post-tap day two.

Learning Objectives

By the conclusion of this session, participants should be able to:

- 1) Describe the benefits of performing an outpatient LTT
- 2) Understand the benefits offered by a second day of testing
- 3) Identify specialized gait evaluations that can help select patients for shunt surgery

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