

Introduction

A short-term lumbar-drain trial is commonly used to assess the response of normal pressure hydrocephalus (NPH) patients to cerebrospinal (CSF) fluid diversion. The purpose of this analysis is to examine the predictors and outcomes of lumbar-drain trial for patients with NPH.

Methods

Retrospective review of 254 patients (144 male; 110 female) with NPH who underwent a lumbar-drain trial (March 2008 – September 2017). All patients had at least two symptoms of the classic NPH triad with evidence of ventriculomegaly on brain imaging disproportionate to brain atrophy. CSF drainage was continued for four days. Outcome measures included: Berg balance score and Mini-Mental State Examination. Passing the lumbar-drain trial was defined as improvement by one or more standard deviations on any assessment scale. Linear regression models were constructed to explore for predictors of passing the lumbar-drain trial.

Results

Subject mean age was 77 years and mean duration of gait disturbance, cognitive decline, and urinary incontinence prior to presentation were 29 months, 32 months, and 28 months, respectively. The mean hospital length of stay was 4.3 days. Fifty-six (22%) patients passed the Berg test alone, 8 (3%) passed the cognitive test alone, and 17 (7%) passed both. Multivariate regression (MAX-R) revealed predictors of passing the lumbar-drain trial as having no previous history of stroke and having disproportionate subarachnoid spaces ($r^2=0.12$, $p<0.05$). Complications included a sheared lumbar-drain catheter requiring operative removal ($n=1$), meningitis ($n=3$), lumbar epidural abscess requiring surgical evacuation ($n=1$), and CSF leak at the insertion site ($n=5$). Three patients had early termination of the trial for: transient lower extremity numbness, slurred speech, or refractory headaches. Hyponatremia was encountered in one patient.

Conclusions

Lumbar-drain trials are generally safe and well-tolerated. The best predictors of passing the lumbar-drain trial include no previous history of stroke and having disproportionate subarachnoid spaces.

Table	
Cause of complications	Total number
Overall No. of complications	14 (5.5%)
CSF leak at insertion site	5 (2.0%)
Meningitis	3 (1.1%)
Lumbar epidural abscess	1 (0.4%)
Transient lower extremity numbness	1 (0.4%)
Slurred speech	1 (0.4%)
Refractory headaches	1 (0.4%)
Sheared lumbar-drain catheter	1 (0.4%)
Hyponatremia	1 (0.4%)

Complications of LD trial in patients with normal pressure hydrocephalus.

Learning Objectives

- 1) Recognize normal pressure hydrocephalus as a real health problem in elderly
- 2) Understand the diagnostic criteria and predictors of passing a lumbar drain trial
- 3) Identify potential complications and clinical outcomes