

A comparison of external ventricular drain placement accuracy and safety done by midlevel practitioners and Neurosurgeons.

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Introduction

External ventricular drains (EVD) are used frequently for the monitoring and treatment of elevated intracranial pressure (ICP) in neurosurgical patients with acute intracranial pathologies: including traumatic brain injury, hemorrhage, obstructive hydrocephalus or other causes of cerebral edema. The purpose of this study is to perform a retrospective chart review to evaluate the accuracy and complications—hemorrhage and infection—following EVD placement by Mid level providers (MLPs) and Neurosurgeons.

Methods

We performed a retrospective review for all patients with an EVD placed between January 2012 and September 2016 at a level 1 trauma center. We compared safety and accuracy of EVD placement between senior neurosurgeons and MLPs. Accuracy was determined by spontaneous flow of CSF from EVD and a post operative CT scan showing the catheter tip within the lateral or third ventricle.

Results

MLP first attempted EVD placement in 238 patients and senior neurosurgeon first attempted EVD placement in 70 subjects. There was no significant difference between accuracy of placement within the ventricle, (87.4% vs 91.4%, p = 0.437136), hemorrhage rate (5.9% vs 4.3%, p = 0.77, or infection rate (0.8% vs 1.4%, p = 0.5399) for placement attempted by a MLP compared to a senior neurosurgeon, respectively.

Conclusions

With a rigorous standardized training program, MLP performed EVD placement safely with no significant difference in accuracy of placement or complication rates compared with placement by senior neurosurgeons. This may allow for earlier management of elevated intracranial pressure and access to care where previously unavailable; leading to improved patient outcomes.

References

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Learning Objectives

By the conclusion of this session participants should be able to: 1. identify what the acceptable level of complications are during external ventricular drain (EVD) placement. 2. determine if mid level providers can safely and accurately place EVDs. 3. determine what an acceptable level of supervision is prior to letting mid level providers place EVDs on their own