Can Neurosurgical Trainees Insert External Ventricular Drains (EVD)? A Retrospective Analysis of EVD Placement and Outcomes Over 5 Years at a Single Unit

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Introduction

We aimed to review the adequacy of external ventricular drain (EVD) insertion performed by neurosurgical trainees with regards to accuracy of catheter placement, complications including EVD-related ventriculitis and outcomes. Risk factors for complications were also assessed.

Methods

Data were collected on indication for EVD insertion; surgeon; skin preparation; accuracy of placement using a grading scale (0 to 2: adequate = 0, sub-optimal = 1, harmful = 2, according to postoperative imaging); incidence of EVD-related ventriculitis; Glasgow Outcome Score; and mortality.

Results

272 EVDs were inserted, all by trainees, predominantly for subarachnoid haemorrhage and tumour. 86.4%, 11.4% and 2.2% of EVDs were adequately, sub-optimally, and dangerously sited necessitating replacement, respectively. Of 249 de novo EVD insertions, there were 21 cases of EVD-related ventriculitis (8.4%) with a mortality of 24%. Mean duration of EVD was higher amongst those who sustained EVD-related ventriculitis versus those who did not (8.3 vs 6.7 days, p=0.007). Median infection-free survival across the cohort was 7.0 days. 51% of all patients made a good recovery or were moderately disabled versus 24% of those sustaining EVD-related ventriculitis (p=0.03). 31% required a ventriculoperitoneal shunt.

Conclusions

Trainees must improve EVD placement in 14% of cases to avoid a small risk of serious harm. EVD-related ventriculitis rate is consistent with the literature and carries a high mortality.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the rate of optimal / suboptimal / dangerous placement of EVD's by trainees, 2)Discuss the complication rate including ventriculitis associated with EVD insertion, 3) Discuss methods to minimise complications of EVD insertion

References

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