CNS 2017 ANNUAL MEETING
BOSTON, MASSACHUSETTS OCTOBER 7–11, 2017

Complications Associated with Extraventricular Drain Placement at University of Pennsylvania: A Retrospective Review

Ashwin G. Ramayya MD, PhD; Brendan McShane BA; Joel M Stein; Marc Branche; Vivek Buch MD; Kalil G. Abdullah MD; H. Isaac Chen MD; Ali Kemal Ozturk MD

Introduction

Extraventricular drain (EVD) placement at the bedside using a freehand technique is a common neurosurgical procedure used for for treatment of elevated intracranial pressure or CSF leak. We performed a single-center retrospective review to assess the safety and accuracy of this procedure at our institution.

Methods

We reviewed charts of patients that underwent EVD at the Hospital of the University of Pennsylvania (HUP) and Penn Presbytarian Medical Center (PPMC) from January 1st, 2011 to July 1st, 2016. We identified 139 EVD placements (108 first-time placements, and 31 revision procedures). We collected data regarding demographics, medical co-morbidities, complications and catheter tip location. We performed univariate and multivariate statistical analyses using MATLAB. We considered a p-value of 0.05 to be statistically significant.

Results

Most common indications included subarachnoid hemorrhage (SAH, n = 30, 27.7%), intraparenchymal hemorrhage with intraventricular extravisation (ICHwIVH; n = 24, 22.2%), tumor (n = 20, 18.5%), and trauma (n = 17, 15.7%). 22.2% (n = 24) of patients underwent at least one revision procedure. Among all EVD placements (n = 139), most common complications included radiographic-evidence of intracranial hemorrhage (n = 17, 12.2%) and blocked drain (n = 22, 15.8 %); rare complications included infection (n = 4, 2.8%) , stroke (n = 0.72%), CSF leak (n = 2, 1.4%) and accidental removal (n = 2, 1.4%). Using multi-variate regression models, we found that risk factors for post-EVD hemorrhage included revision procedures (OR = 6.11, p = 0.009), hypertension (OR = 4.75, p = 0.045), and ICHwIVH (OR = 5.21, p = 0.019); SAH was associated with reduced risk of post-EVD hemorrhage (OR = 0.035, p = 0.012). Blocked drainage was more likely to occur with revision procedures (OR = 4.14, p = 0.012) and less likely to occur with optimum placement (ipsilateral frontal horn or foramen of monroe; OR = 0.237, p = 0.013)

Conclusions

At our institution, bedside EVD placement is associated with a 12% rate of radiographic-evidence of hemorrhage and a 15% rate of blockage, both of which frequently occur during revision procedures. Optimum initial placement may result in fewer revision procedures and fewer complications.

Learning Objectives

By the conclusion of this session, participants should be able to: describe the complication rates and risk factors for those complications associated with bedside, free-hand EVD placement.

[Default Poster]