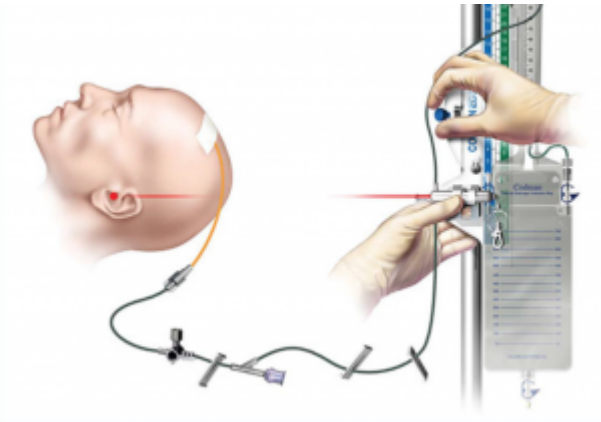
External ventricular drainage complications



Acutely increased intracranial pressure (ICP) is frequently managed by external ventricular drainage (EVD). This procedure is life-saving but marred by a high incidence of complications. It has recently been indicated that bolt-connected external ventricular drainage (BC-EVD) compared to the standard technique of tunnelled EVD (T-EVD) may result in less complications [1)].

Intracranial hemorrhage

see Intracranial hemorrhage after ventriculostomy.

Infection

see Ventriculostomy related infection.

Misplacement

see Ventricular catheter misplacement.

Obstruction

Ventricular catheter obstruction.

The purpose of this study was to investigate whether a surgeon's experience affects the associated complication rate. Methods This retrospective study included all adult patients undergoing EVD insertion at a single centre between July 2013 and June 2015. Medical records were retrieved to obtain details on patient demographics, surgical indication, risk factors for infection and use of anticoagulants or antiplatelets. Surgeon experience, operative time, intraoperative antibiotic prophylaxis, need for revision surgery and EVD associated infection were examined. Information on catheter tip position and radiological evidence of intracranial haemorrhage was obtained from postoperative imaging. Results A total of 89 patients were included in the study. The overall infection, haemorrhage and revision rates were 4.8%, 7.8% and 13.0% respectively, with no significant difference among surgeons of different experience. The mean operating time for patients who developed an infection was 22 minutes while for those without an infection, it was 33 minutes (p=0.474). Anticoagulation/antiplatelet use did not appear to increase the rate of haemorrhage. The infection rate did not correlate with known risk factors (eg diabetes and steroids), operation start time

(daytime vs out of hours) or duration of surgery although intraoperative (single dose) antibiotic prophylaxis seemed to reduce the infection rate. There was also a correlation between longer duration of catheterisation and increased risk of infection. Conclusions This is the first study demonstrating there is no significant difference in complication rates between surgeons of different experience. EVD insertion is a core neurosurgical skill and junior trainees should be trained to perform it [2].

Patients were prospectively enrolled in the CLEAR III trial after placement of an EVD for obstructive intraventricular hemorrhage and randomized to receive recombinant tissue-type plasminogen activator or placebo. We counted any detected new hemorrhage (catheter tract hemorrhage or any other distant hemorrhage) on computed tomography scan within 30 days from the randomization. Meta-analysis of published series of EVD placement was compiled with STATA software.

Growing or unstable hemorrhage was reported as a cause of exclusion from the trial in 74 of 5707 cases (1.3%) screened for CLEAR III. The first 250 patients enrolled have completed adjudication of adverse events. Forty-two subjects (16.8%) experienced ≥1 new bleeds or expansions, and 6 of 250 subjects (2.4%) suffered symptomatic hemorrhages. Eleven cases (4.4%) had culture-proven bacterial meningitis or ventriculitis.

Risks of bleeding and infection in the ongoing CLEAR III trial are comparable to those previously reported in EVD case series. In the present study, rates of new bleeds and bacterial meningitis/ventriculitis are very low despite multiple daily injections, blood in the ventricles, the use of thrombolysis in half the cases, and generalization to >60 trial sites [3].

References

1)
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3)
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