

Placement of EVD:

1. Obtain Consent
2. Confirm Coagulation Status of Patient
3. Gather Supplies
 - a. Cranial Access Kit
 - b. EVD Catheter
 - c. Drainage Bag Kit
 - d. Electric Razor
 - e. Silk Tape, 2 inch
 - f. Betadine Prep Solution & Tubs of Gauze
 - g. 2-0 or 3-0 Silk Suture for Securing Drain
 - h. $\frac{3}{4}$ Drape for Patient
 - i. Hand Towel & 2 inch Tape (to make head roll for positioning)
 - j. Gown/Gloves/Eye protection
 - k. Nurse to have any sedation/pain medications immediately available
 - l. Antibiotics
4. Position Patient
 - a. Supine, top of head at edge of bed
 - b. Place head on donut made from rolled up towel for stabilization
 - c. 2 inch tape across forehead, securing patient's head to bed
 - d. Adjust bed position so head is at an angle/level allowing ease of drilling/catheter placement (elevated ~20-30 degrees)
 - e. Adjust foot of bed so that legs elevated slightly so patient does not slide down in bed
5. View Imaging/Confirm Side of Placement
6. Shave either R or L Frontal Region
 - a. Make sure to shave large enough region to allow for catheter tunneling
7. Mark Location for EVD Placement
 - a. Make sure head is facing straight ahead, mark midline
 - b. Feel for the coronal suture & mark this
 - c. Measure 11 cm back from the nasion & 3 cm laterally, mark this (Kocher's Point)
 - d. Confirm that you are in line with the mid-pupillary line & are anterior to the coronal suture
8. Prep Patient: Betadine Soaked Gauze x 3
9. Open Cranial Access Kit at all supplies onto tray/table in sterile fashion
10. Put on sterile gown/gloves
11. Perform Timeout
12. Drape Patient: drapes in cranial access kit & $\frac{3}{4}$ drape
13. Confirm EVD entry point that was marked, lay out all supplies/assemble drill
14. If using local anesthetic, inject now (include tunneling trajectory with this)
 - a. Included in cranial access kit
15. Incision: linear, centered over marked entry point, approximately 2.5cm in length

- a. Place small self-retaining retractor
16. Drill: position drill orthogonal to skull and make burr hole without changing angle
17. Durotomy: Make small hole through dura using one of the needles in the kit
18. EVD catheter insertion
 - a. Identify where 6cm is on the catheter, this is the maximum depth to be inserted at the outer table of the skull
 - b. Position catheter orthogonal to skull (aimed at the junction of a line extending backwards from ipsilateral medial canthus & a line extending coronally from the ipsilateral tragus)
 - c. Advance catheter until you either see CSF return or feel a “pop” indicating entry into the ventricle. At this point advance the catheter a few more millimeters to ensure the catheter tip is fully in the ventricle (maximum depth = 6cm at the outer table of the skull)
 - d. Remove the stylet, confirm CSF drainage
19. Tunnel Catheter
 - a. Attach tunneler to catheter
 - b. Hold the catheter tubing at the skull with a NON-toothed forceps to ensure that it does not move
 - c. Tunnel catheter under skin approximately 3-4 cm posteriorly from insertion site
 - d. After exiting skin, cut off tunneler from catheter & confirm that it is still draining
 - e. Attach cap to catheter temporarily to prevent excessive drainage
20. Secure Catheter
 - a. Secure catheter at skin exit site 1st to minimize possible movement
 - b. Remove small self-retaining retractor, being careful not to disturb the catheter
 - c. Close incision site, interrupted silk sutures
 - d. Place silk tie around end of catheter where cap attachment is located to secure these two pieces together
 - e. Secure catheter in semicircle shape laterally with 3-4 interrupted sutures along its length
21. Attach to Drainage Bag
 - a. Nurse has already prepped tubing of drainage system in sterile fashion with preservative free saline
 - b. Attach catheter tubing to drainage bag tubing in sterile fashion, being careful not to touch the ends of the tubing
 - c. Make note of the initial ICP
 - d. Level drainage bag with zero at the tragus & set to appropriate drainage height
22. Remove Drapes & Place Sterile Dressing
23. Document Procedure