Endoscopic Third Ventriculostomy Technique

1. Equipment: requires a rigid endoscope (does not work well with flexible)

2. image-guided stereotactic technology helps immensely with the trajectory, but once you've entered the third ventricle, you must navigate by visual landmarks and cannot rely on image guidance because of the limitations of the accuracy

3. burr hole: 2–3 cm lateral to the midline just anterior to the coronal suture (Kocher's point)

4. pass through the foramen of Monro and fixate the sheath just within the third ventricle

5. the third ventricle floor is inspected and must be thin enough and translucent enough to permit visualization of the basilar artery and mammillary bodies. If these structures cannot be visualized then the procedure should be aborted

6. the location of the opening is chosen:

a) in the midline (avoid sp-commandPCA)

b) in the region of the tuber cinereum(prominence of the base of the hypothalamus, extending ventrally into the infundibulum and pituitary stalk)

c) posterior to the infundibular recess

d) anterior to the mammillary bodies

e) anterior to the tip of the basilar artery

7. an effective technique consists of "rubbing through" the floor of the third ventricle either with a probe or Decq forceps. Alternatively, hydro dissection or bipolar electrocautery may be used to thin down the lamina.

✖ Do not use laser due to the possibility of injury to basilar artery! [1].

8. the opening can be enlarged with the Decq forceps, or a 3 French Fogarty balloon or a double balloon (Fogarty or NeuroballoonTM catheter (Integra LifeSciences 7CBD10)). The balloon is inflated distal to the opening in the floor and is then withdrawn through the opening

9. the opening does not need to be large (unlike e.g. fenestration of arachnoid cyst): ≈ 4–5 mm is usually adequate [2] [3].

10. after penetrating through the floor of the third ventricle, make certain that you can see vessels (sometimes the arachnoid is not perforated, or there is a second membrane or webs of membranes that need to be lysed)

11. consider injection of diluted iohexol or other intrathecal contrast agents into the lateral/third ventricle (see ventriculogram) prior to removal of scope. CT head 1 hour after surgery will show diffuse subarachnoid contrast in cisterns and over convexity if ETV successful

12. sagittal T2 weighted,thin-slice sequence will show dropout of T2 signal at stoma of ETV

1)
McLaughlin MR, Wahlig JB, Kaufmann AM, et al. Traumatic Basilar Aneurysm After Endoscopic Third Ventriculostomy: Case Report. Neurosurgery. 1997; 41:1400–1404
2)
Grant JA, McLone DG. Third ventriculostomy: a review. Surg Neurol. 1997; 47:210–212
3)
Jones RF, Stening WA, Brydon M. Endoscopic third ventriculostomy. Neurosurgery. 1990; 26:86–91; discussion 91-2