AWAKE CRANIOTOMY

Contributed June 2014 by Rita Torng

Pre-op business:

1. Make sure that patient has adequate mental status and IQ.
2. Patient can’t have claustrophobia, PTSD, or mental illness.
3. Neurologic exam: check CNs 5, 7, 8, 9, 10, 12
4. Does the patient wear corrective eye wear? Nystagmus, blurry vision, or diplopia?
5. Preoperative language skills: reading, word finding, expressive aphasia, comprehension, identification and recognition of simple objects, ability to write and calculate, short and long-term memory.
6. Is the patient taking steroids? They may improve symptoms.
7. Signs of increased ICP.
8. Does the patient have seizures? He should continue to take his anti-seizure medications the day of surgery; may check a blood level.
9. Does the patient have vascular or migraine headaches? Give prophylaxis or intra-operative milrinone or lidocaine.
10. Does that patient have significant nausea/vomiting?
11. Airway examination.
12. Does the patient have arthritis, history of joint surgery or injury? This can be problematic because it’s a long surgery in a kind of awkward positioning.
13. Stay away from pre-operative medications because benzos can affect memory 🡪 if necessary, use propofol gtt at a low rate.

Risks of awake craniotomy: seizures, hypoxia, airway compromise, stroke, coma, death.

Place arterial pre-operatively with 25 mcg of Fentanyl +/- 20 mg of Propofol, no BZDs!!

Scalp block: 6 bilateral terminal sensory nerves

1. Supratrochlear.
2. Supraorbital.
3. Auriculotemporal.
4. Zygomatico-temporal.
5. Lesser occipital or posterior auricular.
6. Greater occipital.

* Use 0.5% ropivacaine with epinephrine 1:200,000 🡪 maximum dose is 4.3 mg/kg.
* If you’re diluting it yourself: 50 mL of 0.5% ropivacaine with 0.25% of epinephrine 1:1000 (ampule has 1 mg/mL.)
* Don’t forget to always aspirate before you inject to make sure you’re not in the occipital artery.
* The supraorbital and supratrochlear nerves are branches of V1.
  + The supraorbital nerve emerges through the supraorbital foramen which lies in the midpupillary line.
  + The supratrochlear nerve exits 1.5 cm medial to the supraorbital foramen.
  + 🡪 both nerves are blocked by injecting the entire length of the eyebrow.
* The auriculotemporal nerves are blocked with 1-3 mL of local anesthetic 1.5 cm anterior to the ear at the level of the tragus.
* The zygomatico-temporal nerve is blocked with 3-5 mL of local anesthetic 1-2 cm lateral and 1 cm superior to the lateral canthus of the eye above the zygomatic arch.
* The posterior auricular branches of the greater auricular nerves are blocked with 5 mL of local anesthetic between skin and bone, 1.5 cm posterior to the ear at the level of the tragus in a field block.
* The greater, lesser, and third occipital nerves are blocked with 5 mL of local anesthetic by infiltrating along the superior nuchal line, halfway between the occipital protuberance and the mastoid process.
* In redo craniotomies when the old bone flap may traverse the new incision site, extra caution is warranted 🡪 reports of accidental total subarachnoid blocks or intraneural blocks following scalp blocks (yikes!)

Order of events with GWL:

1. Scalp block performed while patient on stretcher: hook up pulse oximeter and arterial line, start Propofol gtt and bolus Propofol as needed.
2. Continue sedation for Foley placement.
3. Turn off Propofol gtt once Foley is in the right hole so patient can start waking up as nurse finishes up securing the Foley in place.
4. Patient needs to wake up to position himself comfortably on OR bed: bean bag, axillary roll, surgeon holds head.
5. Place BIS monitor if it won’t be in the way for surgeon.
6. Hook up NIBP, EKG, temperature probe.
7. Surgeon pins head: this is where you see if you did a good job with your scalp block, supplement with Propofol boluses if you sucked it up.
   1. Make sure patient is always in a sniffing position, especially after surgeon does his head pinning 🡪 otherwise you will have a hard time getting the LMA back in when you need to.
8. Organize IV and arterial line tubing, monitor lines.
9. Monitoring Mike and his minion do their things.
10. Start antibiotics, give anti-emetics.
11. General anesthesia with LMA placed in the lateral position: spray oropharynx with MADGIC wand with lidocaine, coat generously with lidocaine jelly.
12. Maintenance: Desflurane 0.5-1.0 MAC, Remifentanil gtt @ 0.5-1 mcg/kg/min, propofol gtt @ 25-100 mcg/kg/min, BIS to monitor awareness.
    1. Titrate Propofol gtt to sedation, Remifentanil gtt to respiration, phenylephrine gtt for MAP > 80.
13. Monitor closely for movement.
14. Surgeon will ask for Mannitol, Furosemide, and Dexamethasone.
15. Monitor UOP and replace with IVF – don’t fall behind! But don’t overhydrate!!
16. Controlled ventilation for ETCO2 ~ 30, especially when close to removing bone flap.
    1. Hyperventilation can help with brain relaxation, ICP control, and improving surgical exposure.
17. Monitor ICP by looking over drapes: is the dura bulging?
18. Wake-up time:
    1. Use nicardipine or labetalol to maintain appropriate blood pressure.
    2. Remove LMA once patient is awake, breathing spontaneously, and following commands.
    3. Place the patient on O2 via nasal cannula.
    4. Monitor neurologic status, especially aphasia and motor weakness.
19. Patient is seizing!
    1. Focal seizure usually resolves with direct cold saline irrigation of the brain by surgeon.
    2. Grand mal seizure 🡪 airway first! Give some propofol, book says thiopental 50 mg