Neuro Quiz 53
Pitfalls in Neuro-anesthesia

THIS QUIZ IS BEING PUBLISHED ON BEHALF OF THE
EDUCATION COMMITTEE OF THE SNACC

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1. Which of the following statements about airway management of a trauma patient with suspected cervical spine injury is TRUE?

A. **Cord injury is suspected only if there is cervical spine fracture or displacement on radiological examination**

B. **If cord injury is suspected, intubation should be done using a flexible bronchoscope with the patient awake**

C. **Mask ventilation causes more cervical spine movement than direct laryngoscopy**

D. **The cervical collar should not be removed while intubating using a direct laryngoscope**
1. A Cord injury is suspected only if there is cervical spine fracture or displacement on radiological examination

• This is INCORRECT
• Cervical spine injury should be presumed in all severe trauma patient
• Absence of bony fracture or displacement on radiological evaluation does not rule out cord injury
1.B If cord injury is suspected, intubation should be done using a flexible bronchoscope with the patient awake.

- This is INCORRECT
- In an emergency situation flexible bronchoscopy may be difficult in an anxious, restless patient with blood and vomit in the airway
- A rapid sequence induction with manual in-line stabilization is appropriate
- Awake flexible bronchoscopy may be required in a difficult airway situation
1.C Mask ventilation causes more cervical spine movement than direct laryngoscopy

- This is CORRECT
- Cine-fluoroscopy was used to measure cervical spine displacement during airway management in 8 human trauma victims with 40 minutes of their death.
- Mask ventilation caused the most displacement (2.93mm), followed by oral intubation over a lighted stylet (1.65mm), oral intubation via direct laryngoscopy (1.51mm) and least with nasal intubation (1.2mm)

1. D The cervical collar should not be removed while intubating using a direct laryngoscope

• This is INCORRECT
• The appropriate cervical collar will limit the mouth opening and the anterior portion of the collar needs to be removed to allow direct laryngoscopy
• However, manual in-line stabilization of the cervical spine should be performed when the collar is removed
2. Which of the statements about postoperative visual loss (POVL) after spine surgery is FALSE?

A. Central retinal artery occlusion is usually unilateral
B. Ischemic optic neuropathy is the most common cause for permanent POVL
C. Ischemic optic neuropathy is associated with emboli into the retinal artery
D. Central retinal artery occlusion is associated with direct compression of the globe
2. A Central retinal artery occlusion (CRAO) is usually unilateral.

- This statement is CORRECT
- Prone position increases the risk of CRAO due to external ocular compression caused by weight of the head against the headrest
- CRAO may be reversible if treated within 6h
- Treatment includes vasodilators, ocular massage and thrombolytic agents
2.B Ischemic optic neuropathy (ION) is the most common cause for permanent POVL

- This statement is CORRECT
- Prone and Trendelenburg position increase intraocular pressure and ophthalmic vein congestion leading to ION
- Anterior ION (AION) is located anteriorly to the lamina cribrosa and is most likely caused by posterior ciliary artery occlusion while Posterior ION (PION) is posterior and results from improper pial vessel supply.
2.C Ischemic optic neuropathy (ION) is associated with emboli into the retinal artery

- This statement is INCORRECT
- The central retinal artery and the posterior ciliary artery are branches of the ophthalmic artery. The veins of the retina drains into the cavernous sinus
- Prone and Trendelenburg position increase intraocular pressure and ophthalmic vein congestion leading to ION
- Central retinal artery occlusion is caused by emboli of the retinal artery
2.D Central retinal artery occlusion is associated with direct compression of the globe

- This statement is CORRECT
- Central retinal artery occlusion (CRAO) is a result of emboli and globe compression resulting in a loss of blood supply of the surface layer of the optic disk
3. The risk factors for hypotension during decompressive craniotomy for intracerebral bleed include all EXCEPT?

A. Low Glasgow Coma Scale score
B. Absence of basal cisterns on CT scan
C. Bilateral dilated pupils
D. Elevated Fibrinogen
3. A Low Glasgow Coma Scale score

- Profound hypotension can occur after dural opening during craniotomy when the intrinsic stimulus for blood pressure elevation such as raised ICP, diminishes
- Low GCS indicates a high ICP
3.B Absence of basal cisterns on CT scan

- Profound hypotension can occur after dural opening during craniotomy when the intrinsic stimulus for blood pressure elevation such as raised ICP, diminishes
- Absence of basal cisterns indicates a raised ICP
3.C Bilateral dilated pupils

- Profound hypotension can occur after dural opening during craniotomy when the intrinsic stimulus for blood pressure elevation such as raised ICP, diminishes
- A bilateral dilated pupils indicate raised ICP
3.D Elevated Fibrinogen

• This is INCORRECT

• Elevated Fibrinogen Degradation Products (FDP) may predict intraoperative hypotension during decompressive craniotomy

• Coagulation disorder triggered by traumatic brain injury can lead to intraoperative hemostatic disorder, hemorrhage and postoperative cerebral edema

4. Which of the following is a relative contraindication for ‘awake’ craniotomy?

A. Temporal lobe tumor
B. Epilepsy
C. Tumor involving the motor cortex
D. Anxiety & Psychiatric disorders
4. A Temporal lobe tumor

• This is INCORRECT
• Resection of tumors adjacent to the eloquent cortex, the pre-motor cortex, the speech cortex, the temporal lobe, and the epileptic focus are the indications for ‘awake’ craniotomy
4.B Epilepsy

• This is INCORRECT

• Resection of tumors adjacent to the eloquent cortex, the pre-motor cortex, the speech cortex, the temporal lobe, and the epileptic focus are the indications for ‘awake’ craniotomy

• Awake craniotomy allows an accurate electrocorticogram recordings and assists complete resection of the epileptic focus
4.C Tumor involving the motor cortex

• This is INCORRECT

• Resection of tumors adjacent to the eloquent cortex, the pre-motor cortex, the speech cortex, the temporal lobe, and the epileptic focus are the indications for ‘awake’ craniotomy

• Awake craniotomy helps delineate the primary and secondary motor cortex and facilitates complete tumor resection while preserving the motor function
4.D Anxiety & Psychiatric disorders

- This is CORRECT
- Patients with severe anxiety and psychiatric disorders may be inappropriate for ‘awake’ craniotomy
- Patients with difficult airways and/or obstructive sleep apnea present relative contraindication for ‘awake’ craniotomy
5. Which of the following statements about intracranial pressure (ICP) is TRUE?

A. ICP provides a direct measurement of cerebral blood flow
B. ICP should be maintained below 30 mmHg
C. ICP monitoring is not indicated in patients with severe traumatic brain injury with a normal CT scan
D. Hyperventilation to reduce ICP should be used only for brief periods as it can cause brain ischemia
5. A ICP provides a direct measurement of cerebral blood flow (CBF)

• This is INCORRECT
• ICP monitoring does not provide direct information about the CBF, it allows one to calculate the cerebral perfusion pressure (CPP)
5.B ICP should be maintained below 30 mmHg

- This is INCORRECT
- The ICP should be maintained below 20 mmHg
5.C ICP monitoring is not indicated in patients with severe traumatic brain injury (TBI) with a normal CT scan

• This is INCORRECT

• ICP monitoring is recommended in all salvageable patients with severe TBI (GCS≤8) and an abnormal CT scan (hematomas, concussion, swelling, herniation or compressed basal cistern)

• It is also indicated in severe TBI with normal CT scan provided age>40, motor posturing or systolic blood pressure <90 mmHg

5.D Hyperventilation to reduce ICP should be used only for brief periods as it can cause brain ischemia

- This is CORRECT
- Hyperventilation is routinely used to provide brain relaxation and optimize surgical conditions
- However, the decrease CBF from hyperventilation-induced cerebral vasoconstriction can potentially cause or exacerbate cerebral ischemia