Intraoperative Extubation Considerations in Patients with TBI

Traumatic brain injury is defined as an alteration in normal brain function caused by an external force. The severity of a TBI can be categorized using the Glasgow Coma Scale (neuroimaging can also be used):

Mild = GCS 13-15

Moderate = GCS 9-12

Severe = GCS <8

Common surgical procedures that TBI patients undergo include: subdural/epidural hematoma evacuation, intracerebral hemorrhage evacuation and decompressive hemicraniectomy for malignant cerebral edema.

TBI patients often present to the OR intubated. It is important to obtain the indication for which the patient was intubated (GCS<8, hypercapnic respiratory failure, needing to institute hyperventilation for ICP control, etc.) and their mental status prior to intubation.

Mechanical ventilation and intubation are critical for the support of patients with traumatic brain injury. Extubation of these patients requires careful thought and consideration.

Discuss the airway management with the neurosurgery service at the end of the procedure. Patients who arrive to the operating room intubated should not be extubated until they meet extubation criteria in the ICU.

In addition to standard extubation criteria, unique considerations in TBI patients include:

- GCS score prior to the procedure. If it was less than 8, keep the patient intubated until the neuro ICU
- Generally, cases involving the posterior fossa will remain intubated due to the risk of brainstem compression
- Keep intubated if there is evidence of increased intracranial pressure during the procedure or ICP>20 if there is an EVD in place.
- Keep intubated if there is evidence of increased intracranial pressure as evidenced by brainstem herniation
- If Pao2/Fio2 ratio is less than than 200, keep the patient intubated. TBI patients are at an increased risk of aspiration and neurogenic pulmonary edema
- Keep the patient intubated if the patient is unable to maintain normocarbia with spontaneous ventilation or if there is a need to hyperventilation post-procedure
- Consider keeping the patient intubated if there is an anticipated need for repeat surgery within the next 48 hours

- Keep the patient intubated if the patient is unable to maintain MAP >60 or cerebral perfusion pressure >60 without continuous intervention
- If extubation is being considered in the OR, ensure the patient has purposeful movements and conjugate gaze prior to extubation.

Main Take Away

The perioperative course of TBI patients is often nuanced and complex, involving many organ systems. ***Ventilatory management is a key component in the care of these patients, and as such, the decision to extubate in the OR should be made jointly and in close communication with the neurosurgery team.***

References

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