Episode 05 - Anesthesia Considerations: Cervical Spine Procedure Shownotes

Jaffe, Anesthesiologist's Manual of Surgical Procedures, CH 1.3 (pg 218)

Procedures Covered: Anterior / Posterior fusion / fixation of upper and mid/lower C-spine, anterior cervicotheroacic spine surgery

Preoperative

- Respiratory
    - If trauma, could cause acute respiratory failure, causing hypoxemia / hypercapnia --> immediate airway control
    - DL w/ manaul in line stabilization is rapid and reasonable approach, though video techniques may allow airway control w/ less neck manipulation
    - Assess for other injuries like pulmonary contusion, pneumo/hemo thorax, tracheal injury, facial injury
    - Labs: consider ABG to quantify respiratory impairment
- Cardiovascular
    - Acute fractures of C spine and spinal cord damage could decrease sympathetic tone (decreases BP and HR) --> neurogenic / spinal shock
        - Treat w/ crystallaoid / colloid, and atropine
        - If suspect spinal cord injury, MAP > 80 to keep up with spinal perfusion
    - Labs: as indicated in H&P
- Neurological
    - Herniation of cervical disc presents with pain in neck (especially with lateral rotation)
        - Could be associated with radiation down arms
        - Progresses to weakness and atrophy
    - Fractures at T1 could cause paraplegia
    - Fractures above C5 could cause quadriplegia / loss of phrenic function
    - Careful to document preop sensory and motor deficits
    - Labs: MRI, but trauma could be multimodal imaging
- Hematologic
    - Stop antiplatelets 10 days before elective surgery
    - 2 U PRBC crossmatched
    - Labs: HCT, T&C, as indicated by H&P

Intraoperative

- GETA
- Induction
    - Goal is to limit C spine movement
        - DL associated with a lot of movement, though if neck is stable, orotracheal intubation is acceptable
        - Consider other airway management techniques (e.g. fiberoptic, glidescope, etc.)
        - Awake intubation allows for neuro assessment after intubation and positioning
    - Consider wire reinforced tube if prone
    - Choice of induction agent is propofol
    - Consider Sux if MEP, or low dose Roc (0.5 mg /kg), or remifentanil bolus (1.5 mcg / kg)
- Maintenance
    - If no neuro monitoring, standard
    - Consider Roc 0.6 mg / kg or Vec 0.1 mg / kg, for positioning and for insetion of Dingman retractor
    - Gases > 0.5 MAC interfere with MEP (some SSEP)
    - Remifentanil (0.05 - 2 mcg / kg / min)
    - Consider keeping MAP > 80 to ensure adequate cord perfusion
- Emergence
    - If cervical fusion performed, leave ETT until patient is fully awake and following commands (basically ensure that patient could protect their own airway)
    - To test for airway patency, consider deflating cuff to make sure they are able to breathe through and around the tube
        - If concern, could spray lidocaine to reduce coughing
        - Consider airway exchange catheter through ETT
    - Give longer acting opioid prior to emergence
- Blood and Fluid
    - IV x1 16-18 gauge
    - NS/LR @ 4-6 cc/kg/hr
    - T&C
- Monitoring
    - Standard
        - If BP cuff, consider placing on leg at ankle (to avoid surgeons leaning on cuff
    - A-line
        - If CV, respiratory, or metabolic disorder, place A line
        - If with spinal cord injury, or severe stenosis, place A line preinduction
        - If posterior surgical approach and seated, place A line + central line

        - Consider CVP, Precordial Doppler, Urinary Catheter, BIS
        - MEP / SSEP
- Positioning
    - Supine
        - Anterior Cervical Discectomy
            - Roll under shoulders
            - Possible cervical strap below chin (with weight of 5-10 pounds) --> cervical traction
            - Halo or tongs
            - Mayfield 3 point attachment
        - Other considerations
            - Ensure no posterior pressure on ETT
            - Ensure neutral C-spine position
                - Malposiitoning could cause spinal cord damage
    - Prone
        - Pad pressure points
        - Eyes
        - Genitalia
    - Sitting
- Intraop Complications
    - Venous Air Embolism (VAE)
        - Particularly in seated position
        - Paradoxical air embolism through PFO --> CNS / coronary emboli
        - Incidence is up to 76% of patients
            - Consider central line
        - Detect this with precordial doppler, decreased ETCO2, increased ETN2, decreased BP, dysrrhythmia
            - Tell surgeon to flood the field
            - DC N2O
            - Lower head
            - Aspirate RA catheter
            - If doesn't work:
                - Consider PEEP < 10
                - Bilateral jugular compression (increases cerebral venous pressure)
    - Esophagus Performation
        - Anterior approach
        - To assess
            - Flood field, then force air through oropharynx, look for bubbling
    - Retraction Nerve Injury
        - Anterior surgery

        - Damage to recurrent layrngeal nerve
            - Pressure can be taken off by reducing the ETT cuff pressure once retractors are in place
    - Hypotension
        - Calculate MAP at head level
        - Decreased BP due to venous pooling

Postoperative

- Airway obstruction
    - Soft tissue falling back
- Edema / Hematoma
    - Prone positioning and surgical manipulation
- Neurologic deficit
    - Vocal cord paresis from recurrent laryngeal nerve damage
- Tension Pneumothorax

Pain Management

- IV dilaudid
- IV acetaminophen
- PCA