Postoperative Intensive Care of the Neurosurgical Patient

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Surgery

• Supratentorial Area
  – Above the tentorium (double fold of dura mater)
  – Includes cerebral hemispheres

Surgery

• Infratentorial Area
  – Below the tentorium
  – Includes brainstem & cerebellum

Surgery

• Burr Hole
  – Removes small circular area of skull bone
  – Evacuate clot
  – Obtain biopsy
  – Preparation for craniotomy
Surgery

• Craniotomy
  – Surgical opening of the skull
  – Create bone flap

• Craniectomy
  – Excision of portion of skull without replacement

Admission

• Report should include the following
  – Overview of surgery
  – History of preop neuro deficits
  – Pre-existing medical problems
  – Current baseline neurological signs
  – Information provided to family
  – Review of postop orders

Nursing Assessment

• Obtain and monitor vital signs
  – Respiration, oxygen saturation (>94%)
    • Prevent atelectasis/pneumonia, incentive spirometry
  – Blood pressure management
  – Temperature control

• Neurological examination
  – LOC, pupils, motor, sensory
  – Ask neurosurgeon what deficits are expected
Nursing Management

- Incision (Supratentorial or Infratentorial)
  - Skin flap
  - Sutures/stapes removed 7-10 days

Nursing Management

- Head Dressing
  - Turban style dressing
  - MD to remove after 24 hours
  - Monitor for blood or CSF
  - Once removed observe incision for redness, drainage, or signs of wound infection

Nursing Management

- Drain
  - Note location of drain
  - Label drains clearly
  - Measure amount of drainage every 4-8 hours
  - Maintain patency
  - May need bulb suction or gravity
    - NEVER WALL SUCTION

Nursing Management

- Positioning Head of Bed
  - Elevate HOB 30 degrees
  - Maintain neck in neutral position

- Turning and Positioning
  - No restriction

- Ambulation
  - Allowed OOB as soon as tolerated
  - Infratentorial caution with dizziness
Nursing Management

• Nutrition
  – NPO for 24 hours, IV fluids slowly
  – Clear fluids to start, progress diet as tolerated
  – Fluid restriction
  – Infratentorial caution with nausea, swallowing
• Elimination
  – Foley, remove as soon as possible
  – Prevent constipation

Fluid and Electrolyte Balance

• Maintain euvolemia
• Record I & O
• Monitor electrolyte and osmolarity

DVT Prophylaxis

• Sequential compression device
• Heparin, Lovenox
• Administer analgesics as ordered

Postop Neurological Deficits

• Diminished level of consciousness
• Communication deficits
  – Expressive/receptive aphasia (cerebral edema)
• Motor and sensory deficits
• Headache
  – First few days
  – Check head dressing
  – Codeine, Tylenol #3

Postop Neurological Deficits (con’t)

• Elevated temperature
  – Hypothalamus, infection
  – Antipyretics, hypothermia blanket
• Periocular edema
  – Discoloration, ecchymosis
  – Peak 48 – 72 hours (edema last 5 days, ecchymosis last 12 days)
  – Cold compress
• Diminished gag/swallow (CN IX & X)
  – Posterior fossa surgery
Postop Neurological Deficits (con’t)
- Visual disturbances
  - Diplopia (eye patch)
  - Field cuts
- Loss of corneal reflex
  - Eye shield, tape lid shut, artificial tears
- Personality changes
  - Edema, drugs, stress, surgery

Notifying the MD
- Change in Neuro Examination
- Change in Vital signs
- Surgical site dressing or drainage issues
- Abnormal laboratory results (glucose, sodium)
- Uncontrolled pain

Postoperative Imaging
- Know the plan
  - CT Scan with or without contrast
    - Noncontrast determines blood or edema
    - Contrast determines enhancement of tumor
  - MRI with or without contrast
  - Angiogram

Postoperative Complications
Cardiopulmonary
- Monitor oxygenation
- Monitor blood pressure
- Hypovolemic shock
- Cardiac arrhythmias
Postoperative Complications

Cardiopulmonary

• Airway obstruction
• Aspiration
• ARDS
• Neurogenic Pulmonary Edema
  – Sudden increase in ICP

Neurological

• Cerebral hemorrhage
• Increased intracranial pressure
  – Peak 72 hours
• Tension pneumocephalus
  – Entry of air, posterior fossa craniotomy
  – Within 24 hours to 1 week
• Hydrocephalus
  – Edema or subarachnoid bleeding

Neurological

• Seizures
  – Within first 7 days, focal seizure
  – Prophylactic anticonvulsants
• CSF Leakage
• Meningitis
  – Prophylactic antibiotics
• Wound infection
  – Staphylococcal
  – Redness, drainage, foul odor, elevated WBC
• Gastric ulceration/hemorrhage
  – Monitor hematocrit/hemoglobin, stools,
  – Administer histamine H2-blocker
• DVT
  – High risk
  – SCD

Other

• Respiratory
  – Dyspnexia
  – Increased respiratory rate
• Gastrointestinal
  – Nausea, vomiting, diarrhea
  – Stool frequency
  – Stool consistency
• Wound infection
  – Staphylococcal
  – Redness, drainage, foul odor, elevated WBC
Postoperative Complications

Metabolic Imbalances

- Diabetes Insipidus
  - Decreased production of ADH
  - Hypovolemia, hypernatremia (>145)
  - Monitor volume (U/O > 200cc/hr x 2) and SG(<1.005)
  - Replace volume, DDAVP

- Cerebral Salt Wasting
  - Hyponatremia (<135), replace sodium, give volume

- Hyperglycemia
  - Steroid use, monitor glucose levels

Postoperative Documentation

- Neurological assessment
- Pain level, intervention, reassessment
- Laboratory results (glucose, sodium)
- Drainage amount, color
- Dressing or incision
- HOB elevation
- Activity, Diet
- Use of DVT prophylaxis

Patient/Family Education

- Clarify and reinforce information provided by MD
- Daily hospital expectations
- Interdisciplinary team members
  - PT, OT, Speech, Social Work
- Discharge planning
  - Assess support systems
  - Discharge needs