Lumbar Drain Management
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Disclosure
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Indications
• To examine the CSF as a one-time procedure
• To relieve pressure on the spinal cord during repair of a AAA/TAA
• To allow a dural tear to heal while decreasing pressure within the cranial vault
• During ENT and skull base surgeries

TAAA Repair – Complications and Risks
Complications
• Paraparesis
• Tetraparesis
• Paraplegia
• Loss of bowel or bladder sphincter control

Risks
• Increased cross clamp time
• Sustained hypotension
• Lower spinal cord perfusion
• Rise in CSF pressure

Lumbar Drainage
• Access is usually done with the patient in a lateral fetal position

• Lumbar puncture
Lumbar catheter insertion

- Position patient in lateral decubitus position
- LP at L3 -- L5,
- Advance catheter to L1– L2

Priming Tubing

- The drainage system is primed using aseptic technique
- This is done using sterile preservative-free normal saline
- The system must be free of bubbles and debris to ensure fidelity

**THIS IS A CLOSED SYSTEM – Always use aseptic technic when accessing ie: CSF sampling**

Zero Reference Level

- Level to Zero reference mark on drain to anatomical location as determined by physician
- Re-level with each patient position change
- Set pressure level of graduated burette as ordered by physician

Importance of leveling?

<table>
<thead>
<tr>
<th>Method</th>
<th>Pressure Level</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual checks</td>
<td>3.2 mm Hg</td>
<td>±2.0 mm Hg</td>
</tr>
<tr>
<td></td>
<td>(4.4 cmH₂O)</td>
<td>(SD= ±1.2 mmHg)</td>
</tr>
<tr>
<td>Carpenter’s level</td>
<td>0.95 mm Hg</td>
<td>±1.0 mm Hg</td>
</tr>
<tr>
<td></td>
<td>(1.3 cmH₂O)</td>
<td>(SD= ±1.0 mmHg)</td>
</tr>
<tr>
<td>Laser level</td>
<td>0.7 mm Hg</td>
<td>±0.1 mm Hg</td>
</tr>
<tr>
<td></td>
<td>(0.9 cmH₂O)</td>
<td>(SD = ±0.2 mmHg)</td>
</tr>
</tbody>
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Brisnaire & Robinson, 1997 (450-bed academic medical center)
Rice, et al. 2000 (community hospital)

Fluid dynamics

- Flow occurs from difference in pressure
  - All pressures relatively equal when lying supine

Fluid dynamics

- Ventricular pressure negative
- Lumbar sac pressure relatively positive
- When sitting or standing
Nursing Care

- Patient positioning is vital
  - Lock bed controls
  - Monitor head of bed, drainage height and patient position to prevent overdrainage
  - Patient may turn side to side
  - Educate to call use call light

Lumbar Drainage Complications

- Colonization and infection
- Nerve root irritation
- Tension pneumocephalus
- Subdural hemorrhage
- Herniation

Assessment Changes

- Neuro assessment per hospital protocol
- If patient exhibits:
  - Altered mental status
  - Pupillary changes
  - Motor deficits
  - Disconjugate gaze

- Turn off the drain, lay patient flat, 100% O2 and contact physician

Lumbar Drain Management: Intermittent/Continuous

- Intermittent: set chamber above zero & open to drain as ordered
  - Drain for x minutes
  - Drain for x volume
- Continuous: set chamber to correct level with zero at ordered landmark

Patient and Family Education: CSF Drains in Place

- Activity restrictions
  - Always have drain clamp when moving patient
  - Educate on complications that can occur
- Activities to avoid include
  - Sneezing
  - Coughing
  - Straining
- Nursing care routines
  - Frequent neuro exams
  - Frequent assessment of drain and drainage

Notify the nurse for….

- Change in position to reduce the risk of overdrainage, fractured catheters, or disconnection
- Change in or new onset of physical signs / symptoms, such as headache, leg paresthesia,
- Saturated dressing at catheter site
- Equipment disconnection.
Troubleshooting

- System is not draining
  - May be blocked with debris/blood clot
  - Incorrect height for the drainage system

- System becomes disconnected
  - Follow hospital policy for replacing the system

- Over drainage
  - Patients are awake and will get out of bed when they have been told not to do so.

Care of Device

- Priming solution
- Dressing change
- System change
- Removal
- Troubleshooting no drainage
- Catheter change
- Documentation

AANN.org
Publications / Clinical Guidelines

Care of the Patient Undergoing Intracranial Pressure Monitoring / External Ventricular Drainage or Lumbar Drainage
AANN Clinical Practice Guideline Series

Thank you!!

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