CLINICAL PRACTICE GUIDELINE
Guideline coverage includes NICU KEMH, NICU PCH and NETS WA

Ventriculoperitoneal (VP) Shunt or CSF Reservoir Insertion

This document should be read in conjunction with the Disclaimer

Insertion of a Ventriculoperitoneal (VP) shunt or CSF Reservoir is indicated for the management of infantile hydrocephalus. Hydrocephalus is defined as excess cerebrospinal fluid (CSF) accumulation in the brain due to disturbance of the formation, flow or absorption of CSF.

Infantile hydrocephalus is associated with the following:

- Aqueduct Stenosis, Spina Bifida and Chiari II malformation.
- Dandy-Walker syndrome, Encephaloceles, Viral or Parasitic infections, Arachnoid Cysts, Intracranial Neoplasm's and Vascular Problems.
- Perinatal Intraventricular Haemorrhage (IVH) and Meningitis.
- Trauma, closed head injury.

  (Intraventricular Haemorrhage, Aqueduct Stenosis and myelomeningocele are the most frequent of these causes).

Key Points

- Swabs from the nose and any wound are sent for MRSA and MSSA screening prior to surgery.
- Antibiotic prophylaxis with Vancomycin and Cefotaxime should be commenced 2 hours prior to surgery and then continue for 48 hours.
- Contact neurosurgeon if any bogginess/swelling at shunt/reservoir site.
- Hourly neuro-observations for 24 hours post-op.
- Ensure parents have received education and written information about infection or blockage of shunt and on the care of their infant at home after discharge as this will enable parents to identify the signs of infection and malfunction of the shunt early.

Shunt Characterisation

The VP Shunts that are used are antibiotic impregnated (Rifampicin and Clindamycin). Meta-analyses of observational studies have shown that antibiotic impregnated catheters may decrease the risk of CSF shunt infections. Shunts usually consist of three parts:

1. **Proximal end** that is radiopaque and is placed into the ventricle of the brain. This end has multiple small perforations.
2. **Valve** - this allows for unidirectional flow. Some shunts can be adjusted to various opening pressures (called programmable shunts). Usually has a reservoir that allows for checking shunt pressure and sampling CSF.
3. **Distal end** that is placed into the peritoneum by tracking the tubing subcutaneously.

Pre-Operative Investigations and Management

Preferably start 7 days prior to surgery. However, urgent shunt surgeries should not be postponed for the sake of pre-operative investigations.

- All Infants requiring shunt surgery for open spina bifida must be managed with **Latex Free** care and latex free products i.e. dummies, dressing etc.
- Screen nasal and any skin lesions for the presence of Methicillin Resistant Staphylococcus aureus (MRSA) and Methicillin Sensitive Staphylococcus Aureus (MSSA) - Consult with a clinical microbiologist if results are positive before proceeding to surgery.
- Pre-operative antistaph with 1% chlorhexidine to be attended prior to theatre.
- 2 hours prior to surgery, administer IV Vancomycin 15 mg/kg.

Intra-Operative Management

During surgery, after induction of anaesthesia, ensure that Vancomycin has been completed and flushed through the line. Then administer IV Cefotaxime 50 mg/kg. If Vancomycin has not been administered pre-operatively, reverse the order of antibiotics given. Intra-operative antibiotics have been shown to reduce the risk of shunt or reservoir infections.

Post-Operative Management

- Continue with Latex Free care if indicated.
- Continue antibiotics for 48 hours post-operatively, give 8 hourly Cefotaxime 50 mg/kg (first dose to be given 8 hours post the intra-operative dose)
- Administer IV Vancomycin at 15 mg/kg/dose 8 hourly irrespective of gestation. The first dose is to be given 8 hours post the administration of the intra-operative dose.
- Ensure head and abdominal dressings remain dry and intact. Observe for the accumulation of CSF beneath the skin leading to soft ‘boggy’ swelling near the surgical wound on the scalp. A CSF leak or blockage is associated with the increased risk of shunt infection. If swelling is noted, call the neurosurgeon for review immediately.
- Scalp and abdominal dressings are to be taken down 48-72 hours post-surgery. Remove the dressings only after discussing with the neurosurgeons. Dressings can be removed earlier if the wound is soaked through with blood or there is concern for the wound.
- After the dressing is removed, to minimise the colonisation of bacteria near the surgical wound, clean the area surrounding the surgical sites with 1% chlorhexidine wipes three times a day for three days or until discharged (if before 3 days).
- Neurological observations (using the neurological observations chart, MR494 to be commenced on return to the unit every hour for the first 24 hours post-surgery.
- All sutures are dissolvable. Keep the wound dry for 7 days. Sponging around the area is allowed, if the wound becomes wet then, dry off immediately. If the dressing becomes wet then change the dressings.

Discharge Information Sheet for Parents

References

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Neonatal Clinical Guideline – Pre-Operative Care

Neonatal Medication Protocols – Cefotaxime

Vancomycin

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