Clinical Pathways Program

Clinical Guideline: BROVIAC CATHETER REPAIR IN PEDIATRICS, ED AND INPATIENT

Updated: February 16, 2022

Clinical guideline summary

CLINICAL GUIDELINE NAME: Broviac Catheter Repair in Pediatrics, ED and Inpatient

PATIENT POPULATION AND DIAGNOSIS: Pediatric patients with a broviac catheter needing repair.

APPLICABLE TO: SH Grand Rapids Hospitals

BRIEF DESCRIPTION: This guideline outlines the steps for the care and management of a broviac catheter that is fractured and needing repair.

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MANAGING CLINICAL PRACTICE COUNCIL (CPC): Children's Health

CPC APPROVAL DATE: February 17, 2022

OTHER TEAM(S) IMPACTED: HDVCH, Medical Staff, Pediatric Nephrology , Pediatric Neurology, Pediatric Orthopaedics, Pediatrics

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Clinical pathways clinical approach

TREATMENT AND MANAGEMENT:

1. **Purpose:**
   To outline the steps for the care and management of a broviac that is fractured and needing repair.

2. **Responsibility:**
   Broviac repair shall only be done by pediatric critical care or pediatric surgery physicians, or their NPs and PAs who are trained to do so. Nurses and providers caring for a patient with a repair will follow post-repair care as outlined in this procedure. Children with broken lines that are used exclusively for home TPN should be repaired only by the surgical team.

3. **Equipment Needed:**
   - Appropriate sized catheter repair kit
   - Sterile non-fenestrated drapes and/or sterile towels
   - Sterile gloves, mask, hat
   - Sterile gown (optional)
   - Sterile untoothed catheter clamp or needle holder
   - Angiocaths or blunt needles
   - Large and small sterile gauze
   - Sterile scissors
   - Sterile preservative free 0.9% sodium chloride (NaCl)
   - Heparin (10 units/milliliter) or Heparin/Vancomycin/Ciprofloxacin flush.
     a. Antibiotic choice recommendations: vancomycin is the preferred choice based on likely pathogens +/- Ceftriaxone per provider decision.
     b. If vanco/cipro/heparin flush will be required it should be ordered from pharmacy prior to starting to procedure so that it is available when needed.
   - Sterile 3 mL syringes (3)
   - Dedicated assistant for the operator

4. **Procedure:**

   A. Collect all necessary supplies for the repair and ensure an assistant is available to help with the procedure.

   B. Catheter preparation
      1. Inspect the entire catheter for signs of leak, wall thinning, stretch or other deformity.
      2. Identify a point of the catheter proximal to all defective portions of the catheter. If the catheter has previously been repaired attempt to cut out the old repair.
      3. Gently clamp the catheter proximal to the leak. Protect the catheter from further damage by placing a 2x2 gauze between the catheter and the clamp.
      4. If there is any question regarding the feasibility of catheter repair, contact the pediatric intensivist or pediatric surgeon (depending on who inserted the catheter).

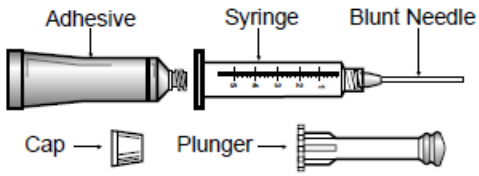
   C. Sterile field
      1. All people in the room including the patient are required to wear a surgical mask and hat. In addition, the operator will consider wearing a sterile gown.
      2. Prepare an ample sterile field area for instruments and repair components.
         Using sterile technique, cleanse any skin and catheter that will be in the sterile field. Scrub with betadine solution for 2 minutes, then allow to air dry for 30 seconds.

D. Repair

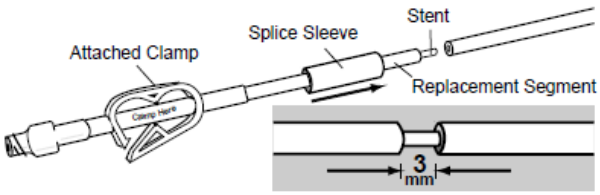
1. Using sterile technique and keeping the catheter clamped, bisect the catheter at a **90 degree angle** with sterile scissors, leaving as much native catheter as possible.
2. To assure proximal catheter patency:
    a. Insert an appropriately sized angiocath (needle removed) or blunt needle into each lumen at the recently bisected portion of the catheter.
    b. Release the clamp.
    c. Gently flush each lumen with sterile 0.9% NaCl. Every attempt should be made to clear any obstruction before repair. If there is a partial obstruction, consider instilling a thrombolytic into the lumens via the blunt needles. If an obstruction cannot be cleared, discuss further plans with the service (PICU, surgery) that placed the line.
    d. If blood cultures are desired they should be obtained at this time.
    e. Once lumens are flushed, reclamp catheter.
    f. Prime the replacement end of the catheter with sterile 0.9% NaCl being careful to keep the metal inserts dry.
3. Sterilely fill syringe with provided adhesive.

    After the operator removes the plunger from the syringe that will hold the glue, the assistant will:
    a. Clean off top of adhesive tube and cap.
    b. Puncture adhesive tube with the top of the cap provided.
    c. Squeeze the glue into the barrel of the sterile syringe that the operator is holding.

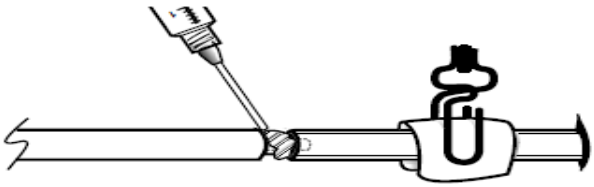
    The operator will then replace the plunger and push out all air from the syringe and blunt needle



4. Finish the repair
    a. Insert the metal ends into the proximal portion of the catheter leaving a 3 mm gap. Be sure to match the lumens appropriately: large repair kit lumen to the large original catheter lumen.

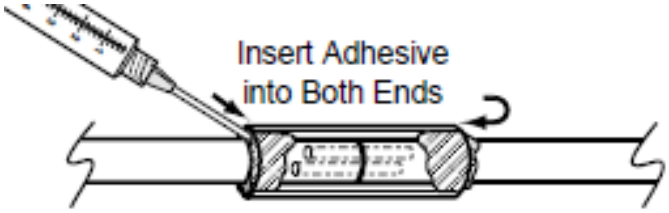


    b. Apply a drop of adhesive in the gap and press the ends together.



    c. Allow this to sit for a minute, then advance the protective sheath over the repair site being careful not to pull the repair apart.

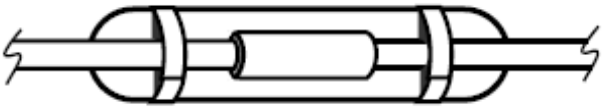
d. Using the blunt needle included in the kit, fill the entire space between the catheter and the sheath with the silicone adhesive, assuring all air bubbles have been flushed out.



e. Remove the catheter clamp and **SLOWLY** draw and flush each lumen of the catheter to assess for patency and test for leakage. Never use high pressure to flush a newly repaired catheter.

f. Heparinize each port with an appropriate volume of preservative free sterile heparin solution or the heparin/ vancomycin/ ciprofloxacin solution listed above.

g. Secure the newly repaired catheter to a padded finger splint while the repair is curing. Be sure the repair is open to the air to assure proper curing (first 24 hours).



E. Post-repair care

1. Do not use the catheter for **2 hours** after repair to allow bond to set. Following this waiting period the line may be used for IV antibiotics only. The catheter should only be used immediately after repair for those children who are:
   a. TPN dependent and require resumption of TPN to maintain glucose levels. These patients may be discharged from the ED after repair and resumption of their TPN if hospital admission is not otherwise needed.
   b. admitted to the hospital and unable to obtain alternative IV access.
2. Crystalloid infusion of any other kind should be avoided if at all possible for **4 hours** post repair.
3. Do not infuse blood products, colloids, or other viscous fluids through the catheter for at least 24 hours after repair.
4. Do not use the catheter for rapid infusions during the first **24 hours**.
5. If blood products are needed during the first **24 hours**, or infusions needed before 2 hours, a peripheral IV should be placed.
6. Monitor the catheter closely for signs of leakage over this first 48 hours post repair.
7. IV antibiotics are strongly encouraged for **24 to 48** hours after the repair. Antibiotics should be delivered through the broviac catheter lumens if at all possible.

F. Documentation

1. Time and date of repair
2. Line patency before and after repair
3. Size of repair kit used
4. Color and side(s) repaired for double lumen broviacs
5. Patient tolerance
6. Heparin Flush or Heparin/Vancomycin/Ciprofloxacin Flush amount and concentration

References:

BD-30813 Hickman, Leonard, Broviac Nursing Procedure Manual.pdf

https://www.crbard.com/CRBard/media/ProductAssets/BardPeripheralVascularInc/PF10023/en-US/BPV-CVCA-1115-0002v-1.1-Hickman-Leonard-Broviac-Nursing-Procedure-Manual.pdf