Non-Dialysis Procedures

Port Placement, Removal, and Management

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Selecting a Vascular Access Device

- Duration of use
- Number of lumens
- Frequency used
- Blood flow requirements
- Preferences
  - physician
  - patient

Duration of Use:

- 3 – 5 days: Peripheral IV or triple lumen catheter
- 7 – 30 days: PICC or small bore tunneled
- 30 – 90 days: Tunneled catheter
- 3 – 12 months: Tunneled catheter or port
- > 12 months: Port

Frequency of Use

- Daily: PICC or tunneled catheter
- Intermittent: Port

A Systematic Review of 200 Published Prospective Studies


Catheter Related Infection per 1000 days

<table>
<thead>
<tr>
<th>Type</th>
<th>Infection Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-tunneled non-cuffed</td>
<td>2.7</td>
</tr>
<tr>
<td>Tunneled non-cuffed</td>
<td>1.7</td>
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<tr>
<td>Tunneled cuff</td>
<td>1.6</td>
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<tr>
<td>PICC</td>
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<tr>
<td>Ports</td>
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Port placement is appropriate for patients requiring long-term intermittent venous access

Tunneled catheter is appropriate for patients requiring chronic but continuous venous access

Port Design
Low profile port systems are as safe as traditional chest ports and reduce the risk of skin perforations which occurs when the port system is too tight within the port pocket.

Attachable vs. Pre-Attached Ports

Retrograde vs. Antegrade Tunneling

Guidelines for Power Injection of Ports

Port Insertion Procedure
Systemic Antibiotic Prophylaxis

Do not administer systemic antimicrobial prophylaxis routinely before insertion of an intravascular catheter. Category IB

Maximal Sterile Barrier Precautions

Use maximal sterile barrier precautions, including the use of a cap, mask, sterile gown, sterile gloves, and a sterile full body drape, for the insertion of CVCs, PICCs, or guidewire exchanges. Category IB

Chlorhexidine gluconate for skin prep

Retract breast using tape

Full body sterile field

Ultrasound imaging of the internal jugular vein

Left chest port enters the internal jugular vein too high (arrow).

This often results in the tip retracting with resulting poor function and/or vein thrombosis.
400 patients received ports
- 132 internal jugular vein
- 136 subclavian vein
- 133 peripheral cephalic vein

Median F/U = 356 days

Complications:
- 0% internal jugular vein
- 0% subclavian vein
- 1.5% peripheral cephalic vein

Standard Seldinger technique using micro introducer set

0.018 inch guidewire
21g needle

Attachable vs. Pre-Attached Ports

Retrograde vs. Antegrade Tunneling

Incision of port pocket

Retrograde tunneling of port catheter

From Eric Walser
Cardiovasc Intervent Radiol 2012; 35:751-764
Correct positioning of dual lumen port and hemodialysis catheter

Port Removal

Maximum barrier precautions
2% chlorhexidine gluconate
70% isopropyl alcohol

Port Related Complications
Algorithm for Management of Port Related Problems

Radiography can be used to determine if port has flipped in pocket

Port catheters have small diameter (9 French) and are more susceptible to kinking when compared to larger diameter catheters.

Hemodialysis catheters do not do this.

Port insertion sheath kinking in subclavian vein

Port catheters have more movement with change in patient position compared to larger diameter catheters.
Patient with cystic fibrosis had episodes of severe coughing 10 days later.

Original port tip position

10 days later

Patient supine

Patient standing

Port needs to be replaced with longer catheter

Length of 1st port

Length of 2nd port

Catheter Fracture
Due to Pinch-Off Syndrome

“Ballooning” of the catheter with injection

Injection of saline into port

Port catheter material can be damaged by mechanical abrasion

Port Infection
Port site infection; pocket was normal

From Gail Sansivero, RN

Breakdown of skin over port

Port placed six weeks ago
Port pocket was filled with grossly purulent fluid

Port pocket was packed with iodoform gauze.

Iodoform packing strips