Port Placement, Removal, and Management

Thomas M. Vesely, MD
Saint Louis, Missouri

Non-Dialysis Procedures

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

- Non-tunneled non-cuffed: 2.7
- Tunneled non-cuffed: 1.7
- Tunneled cuffed: 1.6
- PICC: 1.1
- Ports: 0.1

Port Design

Port placement is appropriate for patients requiring long-term intermittent venous access.

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

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**Full body sterile field**

[Image: Full body sterile field with a cap, mask, sterile gown, sterile gloves, and a sterile full body drape]

**Chlorhexidine gluconate for skin prep**

[Image: Chlorhexidine gluconate being applied to the skin]

**Retract breast using tape**

[Image: Tape being used to retract the breast]

**Ultrasound imaging of the internal jugular vein**

[Image: Ultrasound image showing the internal jugular vein and carotid artery]

**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**

[Image: Left chest port image with an arrow pointing to the tip being too high]
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


Introduction

Attachable vs. Pre-Attached Ports

Retrograde vs. Antegrade Tunneling

Standard Seldinger technique using micro introducer set

From Eric Walser Cardiovasc Intervent Radiol 2012; 35:751-764

Incision of port pocket

Port catheter inserted into right internal jugular vein
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

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

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

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

Fractured port catheter due to "Pinch-Off"

Port Infection

Injection of saline into port

Port catheter material can be damaged by mechanical abrasion
Port site infection; pocket was normal

Breakdown of skin over port

Exposed port

Port placed six weeks ago
Port pocket was filled with grossly purulent fluid
Port pocket was packed with iodoform gauze.

Iodoform packing strips