# Vascular Access Management and Complications

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# Disclosures

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# Objectives

- Selecting the appropriate vascular access device (VAD)
- Addressing and managing potential complications
- Reviewing case-based examples

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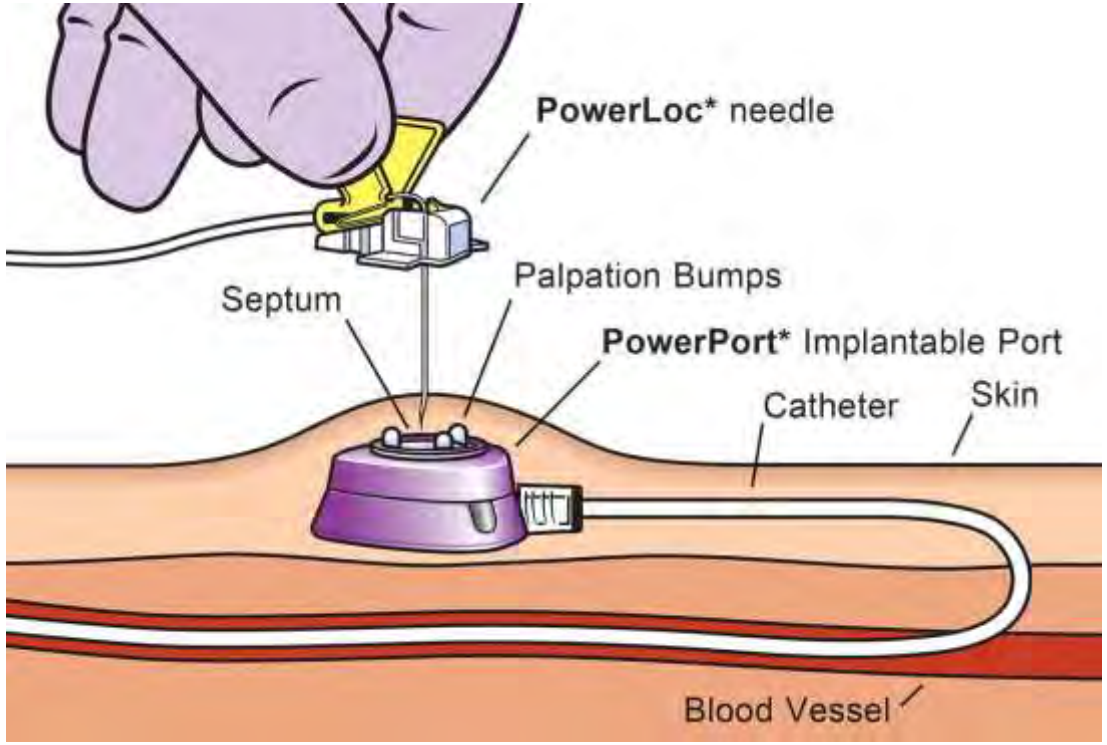
PowerLoc* needle
Palpation Bumps
Septum
PowerPort* Implantable Port
Catheter
Skin
Blood Vessel

# Broviac Catheter

# Types of Vascular Access Devices

- **Port Catheters**: For long-term, intermittent therapy (e.g., chemotherapy); subcutaneous placement reduces infection risk.
- **Hickman/Broviac Catheters**: Ideal for TPN and frequent access, with Broviac often used for pediatric patients.
- **PICC Lines**: Shorter-term solutions for weeks-to-months therapy; useful when frequent blood draws are needed.

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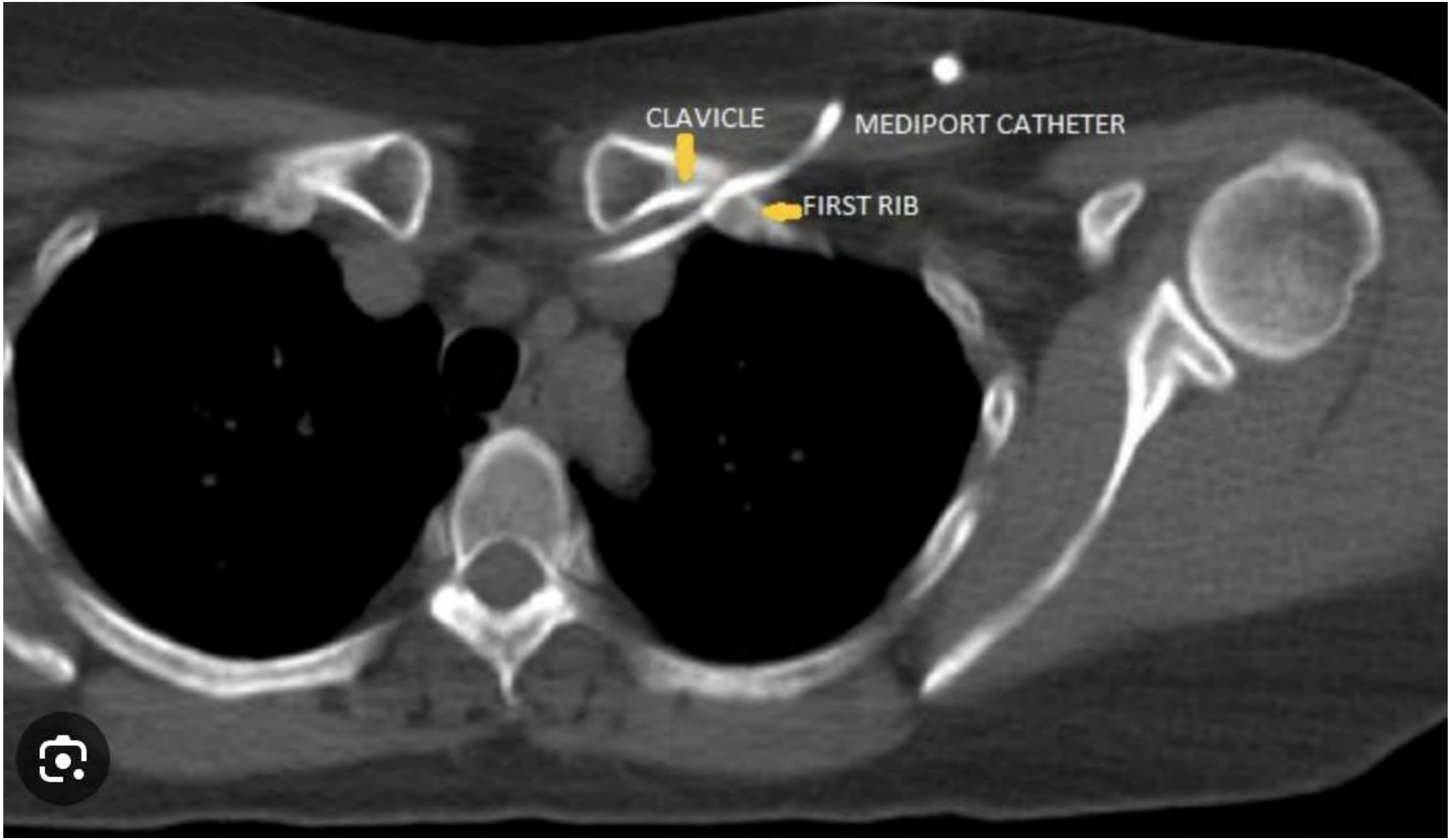
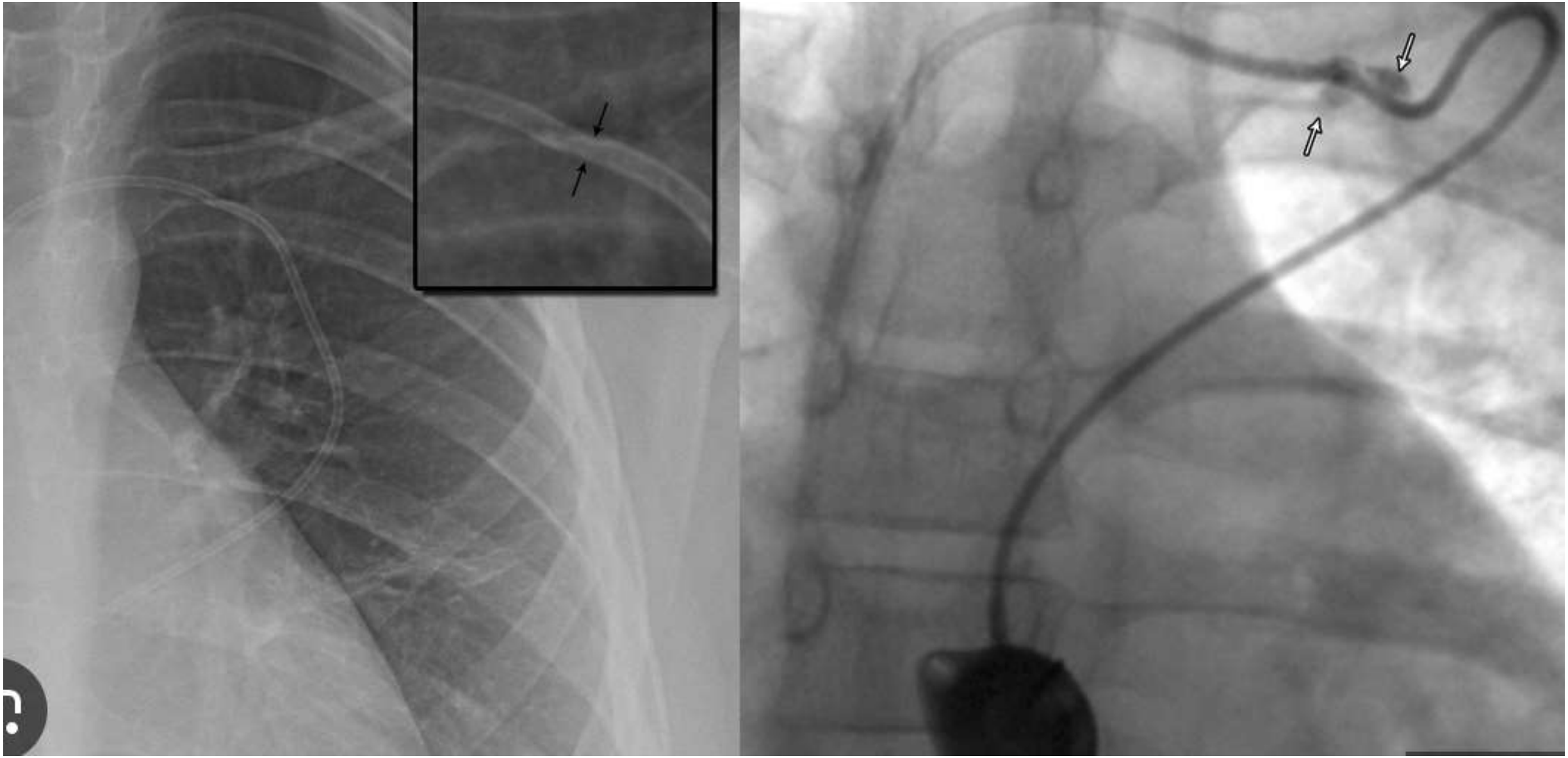
# Vein Preferences for Access Device Placement

- Preferred Veins
  - Internal Jugular
  - External Jugular
  - Subclavian
- Alternate Sites (may pose additional risk)
  - Femoral Vein (infection and DVT risk higher)
  - Hepatic Vein (migration and bleeding risk)
  - Inferior Vena Cava (bleeding risk, catheter exchange challenges)
  - Superior Vena Cava (intestinal/liver transplant)

# Insertion Techniques and Best Practices

- **Sterility & Guidance:**
  - Ultrasound and Fluoroscopic guidance
  - Sterile technique
- **Pinch-Off Syndrome**
  - Uncommon complication of Subclavian vein access
  - secure without excessive bending.
- **Arterial Puncture Prevention**
  - Confirm vein placement (compressibility, distension with Valsalva, doppler)
  - Follow wire with fluoroscopy

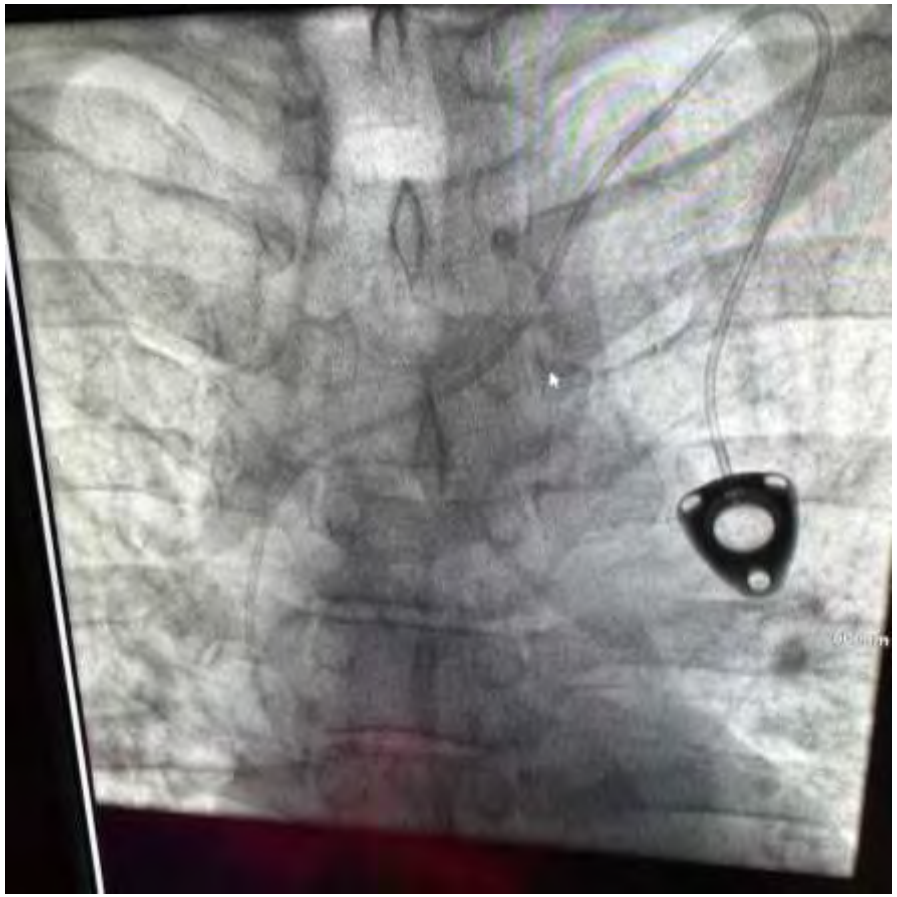

CLAVICLE
MEDIPORT CATHETER
FIRST RIB



# Routine Maintenance Protocols and Patient Education

- **Maintenance Protocols**:**Flushing**: Ports typically flushed every 4–6 weeks, PICCs and Hickman/Broviac daily or weekly, depending on access frequency.
- **Dressing Changes**: Every 7 days for PICC and Hickman catheters or if visibly soiled; less frequent for ports when not accessed.
- **Securement Devices**: Use non-suturing securement to reduce infection risk.
- Patient Education: Advise of when to alert physician/care team of potential problems related to use/possible infection

# Port catheter in Azygous vein



# Patient-Centered Access Site Preference

**Importance of Pre-Procedure Discussion**

Engage patients in the decision, considering lifestyle factors and daily activities.

Explain device options and potential impact based on placement.

# Patient Access Site – Lifestyle considerations

- **Dominant Side Concerns**:
  - Hunters, athletes, or have high-demand activities (musicians)
  - Consider placing the port on the non-dominant side or other alternative location to avoid impairing activities.
- Daily activities
  - Backpack/purse/handbag
  - Strap location
- **Seatbelt Placement**:
  - Discuss how placement can affect seatbelt comfort and safety.
  - Suggest port pillows if port location near where seatbelt will lay
  - Does patient frequently drive or ride as a passenger?.

# Patient Access Site – Special Placement Sites

- **Pediatric Considerations**:
  - For toddlers or young children, placing the port over the trapezius or base of the neck can prevent easy access and manipulation
- **Patients with Skin Issues**:
  - Consider alternatives for patients with tracheostomies or skin lesions, placing access lines in areas less likely to be irritated or obstructed.

# Complications

- **Infections**: Higher with Hickman/Broviac due to frequent access; lower with ports.
- **Catheter Thrombosis**: Common in PICCs, managed with thrombolytics or anticoagulation.
- **Pinch-Off Syndrome**: Primarily with subclavian access, leading to kinking and potential fracture. May require catheter retrieval from pulmonary artery

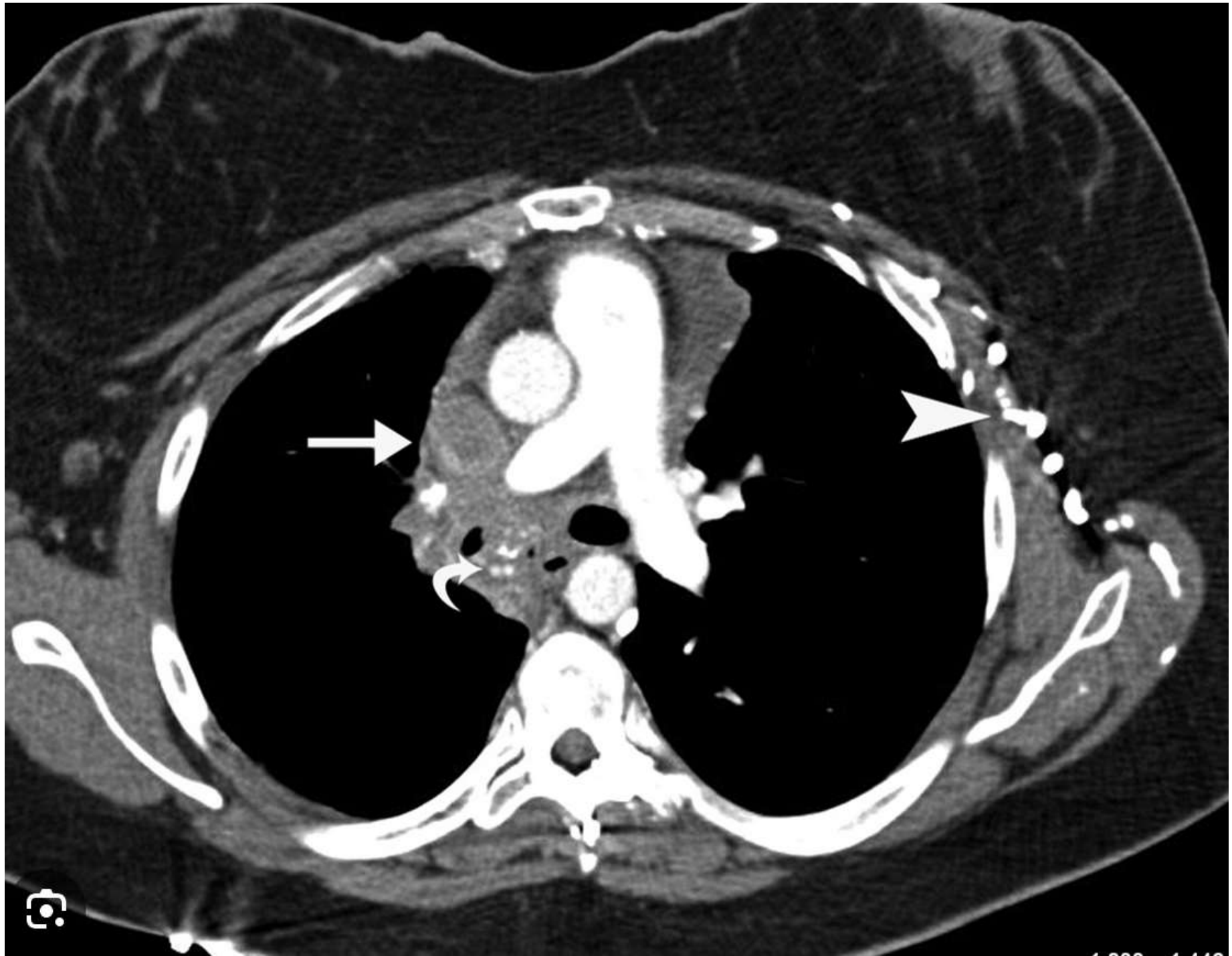
# Infection Prevention and Management

**Prevention**: Sterile technique, appropriate dressing, flushing protocols.

**Management**: Antibiotics vs. catheter removal for infected lines; avoid prophylactic antibiotics unless indicated.

# Thrombosis and Catheter Occlusion

- **Prevention**: Regular flushing, vein selection (subclavian vein higher)
- **Treatment**: Use thrombolytics, consider repositioning or replacing in severe cases.
- **SVC Syndrome**: Symptoms, detection, and urgent management



# Mechanical Complications and Catheter Migration

- **Pinch-Off Syndrome**:
  - Subclavian vein associated with  bending risk
  - signs include occluded flow and chest pain.
- **Device Fracture or Migration**:
  - Risk with repetitive arm movement or accidental pulling.
- **Flipped Port**:
  - Caused by poor securement or patient activity; use imaging to confirm and reposition.
- Migration into azygous vein
  - More common with left sided access
  - Can occur during or after placement

# Summary

## Device Selection:

- Consider therapy duration
- Infection risk
- Patient lifestyle.

## Complication Management:

- Emphasis on interdisciplinary support
- Quick intervention.