PICC Tip Positioning Technology: Inadvertent Arterial Placement

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Purpose

- To present a case study
- Recognize the opportunities for improving the process
- Identify lessons learned and prevention for recurrence

Patient Background

- Female; 67 yo; right handed
- Multiple medical problems
  - Right-sided hemispheric stroke w/symptomatic seizures (recent)
  - Type 2 diabetes
  - Poorly controlled HTN
  - L temporal parietal intracerebral hemorrhage 2002
  - Chronic kidney disease (stage 4)
  - History of seizures
  - Osteoporosis
  - History of UTI
- Admitting diagnosis UTI

Other Pt Information

- Past surgeries
  - Gastric bypass
  - L sided Pacemaker implant 1998
- Allergies
  - Shellfish, sulfa drugs, PCN
- Medications - Multiple
  - Heparin, ASA, anti-fungal, cardiac meds, insulin, anti-seizure, pain control, multi vit, bowel control
- Social – no tobacco, alcohol or illicit drug use
- Difficult access

PICC Line Insertion

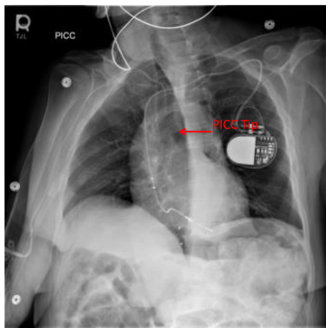
- Right Line/Right Time Paradigm applied
- Informed consent signed; time out performed
- R Basilic vein, 5 Fr DL, MST
- 38 cm inserted with 1 cm on skin
- Ultrasound used
- Electromagnetic Tip Position Sensing Device used
- Sterile occlusive with gauze dressing; securement device applied
- Comfort measures: deep breathing, imagery and verbal reassurance
- CXR ordered

Nursing Documentation

- AVAD Evaluation Outcome
  - Pt has RBV suitable for a DL Power PICC Line: Will attempt to place
  - In adult patient; informed written consent obtained; BSI fact given; time out performed
- Procedure
  - 5 Fr 18 g/18 g DL PICC successfully inserted first attempt; 2 MST kits used; 70 cm guidewire; electromagnetic position sensing wire used; Ultrasound used: 0.8 mL 1% lidocaine used; catheter trimmed 38 cm for total length 39 cm
- Positive blood return obtained
  - 0.9% saline flush use x6; Heparin Lock flush x2

CXR Final Verification: Upper SVC

CXR 1

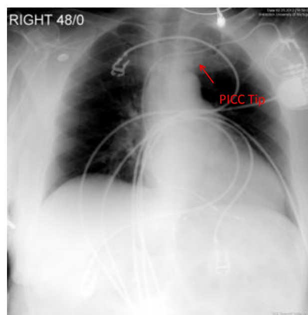


Chest X-ray used with permission of University of Michigan Hospital and Health Centers

Neurology Consult

- Accepted to service
- History
  - Prior evening, noticed rhythmic twitching of LUE
  - Movements appeared consistent with continuous simple partial seizures, responded to lorazepam
  - After initial seizure, did not have recurrence of generalized seizures, but continued twitching of the LUE & perioral area.
  - Noncontrast head CT = new area of low attenuation in R frontoparietal region suggestive of new ischemia, white matter only; etiology of right sided hypodensity remains elusive
- Febrile during convulsion resulted in infectious workup
  - Radiology informed service that RUE PICC was in brachiocephalic vein

CXR 2



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PICC Line to be Exchanged

- 1117 – PICC RN at bedside to do procedure
  - Bedside RN would like to wait for this
- 1357 – PICC RN returned
  - Family at bedside
- 1447 – PICC RN returned to complete procedure

Nursing Documentation

- AVAD Evaluation Outcome: Line will be exchanged
- Patient complained of site pain for 24 hours
- Bruising noted at insertion site
- Line was successfully exchanged
  - Patient complained of intense pain and numbness in her right hand
  - Pain did not resolve with removal of introducer from site during exchange
  - Line was then discontinued
- MD at bedside
- Site bleeding heavily, bright red blood
  - Several 4x4s added and pressure applied for approximately 30 minutes
- MD will have studies ordered for RUE evaluation
- Left upper extremity not appropriate for PICC placement per Cardiology consult
- Midline placement discussed; not appropriate access for current IV infusions and NPO status

Immediate Activity

- VAST RN x2 attempt peripheral IV (PIV) x4
- Rapid Response Team – attempted PIV access in foot
- House Officer at bedside
- Attending MD at bedside
- VAST ultrasound used VAST RN successfully inserted PIV on first attempt
- Vascular Surgery at bedside
  - Right brachial artery cutdown and thrombectomy w/return of blood flow to right hand

- Impact & Outcomes

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