Radial Access: Benefits, Tips and Tricks

NCVH 2016 - Shreveport
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Disclosures

• None
My Journey towards Radial Preference (when able and appropriate)

- 2nd year fellow at VA Shreveport - 2009
  - initial exposure via young faculty
  - dissatisfaction with groin complications and unhappy patients.
- Radial heavy interventional fellowship - University of Rochester, NY
- Current Practice - ArkLaTex Cardiology
  - 95% radial for coronaries
  - intermittent use in structural cases for angiography purposes
  - slow growing use in peripheral (largely limited by equipment availability).
Historical Perspective: this is not a “new” technique

- 1989: Campeau reported first 100 cases of percutaneous transradial coronary angiogram
- 1993: First transradial coronary angioplasty with stent implantation performed by Ferdinand Kiemeneij
- At the present time, throughout the majority of Europe, Japan, Canada 60-70% of catheterization cases are done via transradial approach (European guidelines actually give preference to radial now!)
- US has grown from 1-2% in 2006, to an estimated 20% use at present in 2015/6.
- Currently, in the US, 600-700,000 PCIs/year, 1.5-2 million heart caths (so there is potentially a lot of application)
Local History

- A few cardiologist tried mid 90s - limited by equipment, abandoned the approach
- VA Shreveport - 2009 - present, considerable experience
- At WKHS, growth from estimated <1% 2010, to ~40-50% coronary cases at present
Why radial?....A Picture is Worth a 1000 Words
AGAIN, A PICTURE IS WORTH 1,000,000 WORDS!!!
Radial Access: Reasons to pursue

- Decrease Vascular Access Complication
- Easier to Achieve Hemostasis
- Decreased Bleeding
- Easier Access and Hemostasis in Obese Pts.
- Decreased Time to Ambulation
- Decreased Post-Procedural Cost
- Improved Pt. Satisfaction (*probably the most important one driving increased use and uptake in the US right now*)
- Outpatient PCI
- Improved Outcomes ???
Radial Access: Limitations

- More Technically Challenging
- Longer Physician Learning Curve
- Limited Compatibility with Larger Devices
- Longer Procedure Times?
- More Radiation to Pt. and Operator?
Steps to becoming a Radialist (learning curve)

- **#1:** decide if you think it’s worth it???(complications, costs, patient satisfaction)
  - Data: RIVAL, RIFLE, MATRIX, etc.
  - Text: Patel’s Transradial Atlas, 2nd edition
- **#2:** Patient Set-up/Access skill set
- **#3:** Traversing to the heart (radial spasm, brachial loops, subclavian tortuosity). TAKE A DEEP BREATH!!!(the patient, that is)
- **#4:** Taking pictures
- **#5:** Intervening
- **#6:** Avoiding/treating complications
Wrist Anatomy

Radial Artery

Palmar Arch

Ulnar Artery
Oxymetry + Plethysmography

The clamp sensor is applied to the thumb

- No damping of pulse tracing immediately after radial artery compression (15%)
- Damping of pulse tracing (75%)
- Loss of pulse tracing followed by recovery of pulse tracing within 2 minutes (5%)
- Loss of pulse tracing without recovery within 2 minutes (5%)

Access

• Front wall stick vs through and through back wall technique (angiocath basically with hollow needle/outer plastic lumen)
• Dedicated kits: 10/16/25cm sheaths, 5,6Fr, Slender 6Fr - operator preference largely
Radial Spasm

Pretreatment with Vasodilator, NTG 200-300 mcg

Verapamil 2-5mg via sheath routine
Radial/Brachial loop

- Coronary 0.014 wire
- Straightened the brachial loop with 5-6 F catheter--Multipurpose Catheter
- Long Hydrophilic-coated guiding catheter
Radial Access may be Challenging!!

Significant Subclavian Tortuosity
Diagnostic Angiography

- Peripheral - Left Radial (extra 10-15cm length cut off, 125cm pigtail/multipurpose. Standard length JR4/MP for renals/mesenteric

- Coronary:
  - TIG - short/female
  - Jacky - tall/male
  - JL3.5, JR4-5

- Grafts: LCB/TIG/JR4/Simmons > IMA
Interventional Equipment

• Coronary:
  • RCA: JR4/5 > Hockeystick > XB RCA, ALR1-2 > AL1
  • Left: EBU 3.5 +/-, XBLAD, Ikari
  • Grafts: Multipurpose for SVG to RCA, LCB/JR4 for SVG to left. Left radial approach for considerable amount of CABG cases, especially PCI via LIMA
• Guideliner often helpful
• Sheathless Guide 7Fr for bifurcations (can use 110cm sheath dilator)
• Slender Sheath when needed (6Fr sheath with OD of standard 5Fr sheath - thin walled)
Interventional Equipment

• Peripheral
  • 90cm destination - Iliacs. Limited largely by balloon/stent shaft length
  • JR4/MP1 - Renals/mesenterics
  • Limited use at present due to lack of equipment availability - can’t well reach femoral arteries in majority of patients
Radial Access: Complications
Bleeding/Hematoma

- Small/local at the site of radial puncture - add a 2nd TR band
- Large forearm hematoma - use a manual blood pressure cuff on upper arm to take away systolic pressure head - resolution with 10-15 minutes occlusive pressure in great majority of cases
Radial Recovery
Typical Learning Curve

- 25-50 diagnostic cases first
- 25 -50 Type A interventions, advancing from there
- ~ 100+ cases and less than 4% crossover rate, consider STEMI cases (assuming cath lab staff well-trained and comfortable with radial setup, etc.)….hardest cases to feel “comfortable” with, the biggest likely upside though.