Radial Access, Angiography and Intervention

Shaheen Pandie
Radial vs Femoral

• RADIALIST

I feel like I’m taking crazy pills!

• FEMORALIST
Interventionalist preferring RADIAL as the default access
Overview

• Practical, interactive session
• Review of the basics
• Getting radial access – puncture to engagement
• Catheters
• Tips and tricks for coronary engagement and catheter manipulation
• PCI via radial access
• Complications and troubleshooting
Basics of radial access

Patient selection
- Radial pulse
- Dual circulation
- Previous procedures
- Elective vs ACS (STEMI vs NSTEMI)
Basics of radial access

Patient preparation and equipment selection

• Pre-med
• Local anaesthetic
• Cocktail for spasm
• Dedicated radial access sets
Basics of radial access

**Puncture and wiring**
- Seldinger vs. modified seldinger
- Fewer attempts = less spasm
- Gentle advancement of introducing wire
- Tips, Tricks, Pitfalls

*Figure 6. Radial Artery Access Technique Evaluation Trial.*


Radial artery access technique evaluation trial: randomized comparison of Seldinger versus modified Seldinger technique for arterial access for transradial catheterization.

Pancholy SB, Sanghvi KB, Patel TM.
Puncture technique
Cocktails
Anatomy
Getting from puncture to engagement

Understanding anatomy

TABLE 3. Classification of the Radial Artery
Anatomical Anomalies in Our Patient Population*

<table>
<thead>
<tr>
<th>Anatomical Anomaly</th>
<th>No. of cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ectopic radial origin</td>
<td>22 (59%)</td>
</tr>
<tr>
<td>2. Radioulnar loop</td>
<td>6 (16%)</td>
</tr>
<tr>
<td>3. Radial tortuosity</td>
<td>4 (11%)</td>
</tr>
<tr>
<td>4. Radial bifurcation</td>
<td>3 (8%)</td>
</tr>
<tr>
<td>5. Radial hypoplasia</td>
<td>1 (3%)</td>
</tr>
<tr>
<td>7. Overdeveloped recurrent artery</td>
<td>1 (3%)</td>
</tr>
</tbody>
</table>

*Relative percentages of the total number of radial anatomical anomalies.

Figure (1-A): Large Accessory branch parallel to brachial artery, dye regurgance seen in brachial artery (arrow indicates); (1-B) Complete radio ulnar loop just distal to elbow joint; (1-C) Multi purpose catheter seen over the coronary wire into radio ulnar loop.
Doing it **Safely, Effectively, and Efficiently**
Radial to brachial
Radial to brachial
Radial to brachial
Radial to brachial
Radial to brachial
Radial to brachial
Radial to brachial
Radial to brachial
Radial to brachial
Radial to brachial
Radial to brachial
Radial to brachial
Radial to brachial
Radial to brachial
Radial to brachial
Balloon Assisted Tracking
Balloon Assisted Tracking: A Must-Know Technique to Overcome Difficult Anatomy During Transradial Approach

Tejas Patel, MD, FACC, FSCAI, Sanjay Shah, MD, Samir Pancholy, MD, FACC, FSCAI, Sunil Rao, MD, FACC, FSCAI, Olivier F. Bertrand, MD, PhD, FSCAI, and Tak Kwan, MD, FACC, FSCAI

Catheterization and Cardiovascular Interventions 83:211–220 (2014)
<table>
<thead>
<tr>
<th>Rank</th>
<th>Difficult Vascular Anatomy</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Small radial artery (RA diameter less than 1.5 mm)</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>Significant RA tortuosity</td>
<td>22</td>
</tr>
<tr>
<td>3</td>
<td>Complex RA loops</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Severe and resistant RA spasm</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>Subclavian tortuosity and/or stenosis</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>63</strong></td>
</tr>
</tbody>
</table>
Fig. 7. Schematic representation of "razor effect" and balloon-assisted tracking. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]
Subclavian, innominate and aortic arch
Subclavian, innominate and aortic arch

Left Aortic Arch
With Anomalous RSCA

Right Aortic Arches
Subclavian, innominate and aortic arch

Right Arch with Aberrant Left Subclavian

Double Aortic Arch
Subclavian, innominate and aortic arch
Subclavian, innominate and aortic arch
Subclavian, innominate and aortic arch

- Age
- Anatomical variations
Subclavian, innominate and aortic arch
Subclavian, innominate and aortic arch
Subclavian, innominate and aortic arch
Subclavian, innominate and aortic arch

- Loops
- Anatomical variations
- Congenital anomalies
Cannulation of coronary ostia
Cannulation of coronary ostia
Cannulation of coronary ostia
Bypass grafts
Bypass grafts

- Know your catheters
- Tips and tricks
Bifurcations

• Do you need more than 6F
• Do you have sheathless guides
Bifurcations
Bifurcations
Left main

- 7F guide
- Peripheral angio of radial
- Balloon assisted tracking is radial small
Acute myocardial infarctions

- PPCI via radial only once 100 elective PCI with RADIAL FIRST approach (crossover rate <4%)
- Left radial for PPCI if prior CABG with LIMA; or older than 75; or smaller than 165cm
- Bailout contralateral radial access or femoral access if radial access not obtained within 3 min; or if time to engage infarct artery >10 min; or >20 min to dilation of culprit lesion
- Femoral sites should be routinely prepared
Acute myocardial infarctions
Left main
Left main
CTO’s
There was a significant difference in the rates of crossover due to radial artery spasm (9.5% vs. 3.3%; p < 0.001) and radial artery loops (2.5% vs. 0.8%; p = 0.006) in women versus men.
Crossover
Patent haemostasis
Complications
Questions