RADIAL: TIPS AND TRICKS

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Disclosures

Consultant:
• Bard Medical
Discussion Points

- Avoiding Renal Artery Occlusion
- Radial Artery Spasm
- Radial Tortuosity and Loops
- Atherosclerosis
- Other Challenges
Radial Artery Occlusion (RAO)

Remaining Challenges and Opportunities for Improvement in Percutaneous Transradial Coronary Procedures

Key Points:
- The authors grouped strategies aimed at minimizing the risk of arterial occlusion into three categories: Proven to Reduce Risk, May Reduce Risk, or Not Shown to Reduce Risk.
- The Four “Proven to Reduce Risk” strategies were:
  - Adequate Anticoagulation
  - Patent Hemostasis
  - Smaller Diameter Arterial Sheaths
  - Minimizing the times that the artery is accessed

Administering Heparin to Avoid RAO

Comparison of the Effect of Intra-Arterial Versus Intravenous Heparin on Radial Artery Occlusion After Transradial Catheterization

Key Points:
• No statistical difference between intra-arterial and systemic heparin administration in regards to RAO.
• 500 consecutive patients
• Early RAO 5.6% (ia) vs. 6% (systemic)
• Late RAO 4% (ia) vs 3.2% (systemic)
RAO Dosing Considerations

- The current Society for Cardiac Angiography and Interventions best practice guidelines suggest a heparin dose of 50 units/kg (up to a 5,000-unit maximum dose) for a radial diagnostic procedure.

- Prophet Study used anticoagulation protocol of 50 units/kg to a maximum dose of 5000 Units


Radial Artery Spasm

- Small radial arteries and vasospasm are limitations to radial artery cannulation.
- Risk of arterial perforation
- Risk of arterial thrombosis

Reasons

- Vascular Trauma (Access)
- Friction as a result of catheter movement or sheath removal
- Patient Anxiety

What Happens

- The vessel grips onto the catheter/sheath
- Difficulty of advancement or removal
- Gives great pain to the patient if the system is forced out

Radial Artery Spasm occurs in 2%-6% of patients
Radial Artery Spasm Prevention

- Use of Hydrophilic sheaths and Hydrophilic catheters to reduce friction
- Use of Smaller sheaths and catheters
- Spasmolotic Cocktail (Nitroglycerin 200-400mcg, Verapamil 2.5-5mg). Consider alternate vasodilators/antispasmodic.
- Gentle Sedation
- Additional vasodilators if needed
Focal Spasm
Diffuse Spasm
After Additional Dose of Cocktail
Radial Loops and Tortuosity

• Use fluoroscopic guidance to determine a radial loop has been encountered.
  • Fluoroscopic guidance can help negotiate simple loops.
• An 035 hydrophyllic J glidewire or a more flexible, 0.014” coronary guide wire, can be used to negotiate more complex loops
• After the wire is parked in the brachial, axillary or subclavion region – the catheter is then advanced carefully over the wire.
• The loop can sometimes be straightened after passing through by slightly pulling back on the catheter and wire assembly.
Glidewire

1.5mm J-Tip can track through radial artery with average diameter of 1.0mm - 2.0mm.

1.5mm Radius
Radial Loop
Radial Loop
Atherosclerosis & Calcification

- Atherosclerotic and calcific lesions cause resistance in passing guidewires and/or catheters.
- This resistance most often can not be solved after administering spasmolytic cocktails.
- Flouroscopic guidance can help as the operator tries to overcome the obstruction.
- Advancing the catheter in a slow corkscrew movement under visual guidance can help.
Atherosclerosis & Calcification
Navigating the Arch and Selective Angiography

• Diagnostic and Guide Catheter selections are key to success

• An 035 J tip glide wire in association with catheter support can be used to navigate Subclavian loops and the vessel will straighten once the catheter is directed through the loop

• Once you access the Aortic Arch use an exchange wire to maintain access in the arch for all catheter exchanges

• It is important to stock Guideliners for additional support as needed for PCI
Other Anatomical Challenges

• Distorted aortic route
  • Difficult to navigate to the ascending aorta
  • Wider catheter curves should be considered (ie Tiger Catheters, AL III)
  • The patient can take deep breathes to help enter the ascending aorta.
  • Left radial access is another alternative

• If you have successfully performed a diagnostic procedure via radial access and you are now converting to an Intervention all performed over the exchange wire and the guide will not track up the wire in the radial/brachial region you have likely cannulated an accessory radial artery. Do not try to force the guide up, it will result in a dissection and/or perforation. Your best option is to bail out and proceed with Intervention via femoral access.
Diagnostic Catheters
Standard Right Radial Guide Catheters

Launched Catheters
- 6F
- .071" ERAD LEFT LONG TIP
- .071" ERAD LEFT SHORT TIP
- Medtronic

NCHV 2016
Standard Left Radial Guides

A radial specific catheter that provides enhanced back up support in comparison to standard femoral guide catheter shapes\(^1\) — resulting in simplified procedures.
Case Example of Tortuous Anatomy Using Standard Catheters from the Right Radial
Case Example USING ERAD For PCI
Case Example USING ERAD For PCI
Other Anatomical Challenges

• Bypass Grafts
  • The angle might make it difficult to catheterize the graft.
  • Negotiating from the right may be difficult as the operator crosses the aortic arch.
  • TIG can be used to catheterize saphenous vein grafts.
  • Multipurpose catheters is another alternative to catheterize SVGs.
  • Right radial access may sometimes be the only alternative for radial access when the left has been harvested as a graft.
    • Understanding navigation techniques for LIMAs in this situation is important
Case Example of Bypass PCI USING AL2 from Right Radial Approach
Conclusion

• Decide on dosage for heparin to prevent RAO

• Develop radial cocktail to reduce chances of radial artery spasms

• Stock Inventory that allows you to overcome obstacles and reduce chances of creating radial spasm
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