Complicaciones de Acceso Radial
¿Cómo se Manejan?

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Radial Spasm *Best Management Strategy ➔ Prevention*

- Multiple local agents used according to operator’s preference
  - Calcium Channel Blockers: Verapamil or Nicadipine
    - Patient will complain of burning in the hand
  - Consider Nitroglycerin
    - NTG SQ 400 mcg – Pancholy et al. CCI 2006;68:389-91

- Sedation
  - Anxious patients have increased adrenergic tone that can contribute to spasm

- Use a hydrophilic-coated sheath
- Switch to a smaller size catheter
- Look for anatomic variation (high radial origin from the brachial artery)
Radial Anomalies and Procedural Failure

- **High Bifurcation**: 7% success, 103 failures
- **Radial Loop**: 2.3% success, 22 failures
- **Tortuosity**: 2.0% success, 23 failures
- **Others**: 2.0% success, 34 failures

n=1540

Young age, female sex, diabetes, and low BMI to be independent predictors of RAS

**Pts Undergoing Cath or PCI via the Radial Artery**

2x2 Factorial Randomization

**Operator RAS**
- Long (23 cm) \( n=396 \): 110 (27.9%)
- Short (13 cm) \( n=394 \): 120 (30.8%)*
- Coated \( n=397 \): 75 (19.0%)
- Uncoated \( n=393 \): 155 (39.9%)^*

**Patient discomfort**
- Long (23 cm) \( n=396 \): 85 (21.5%)
- Short (13 cm) \( n=394 \): 87 (22.2%)*
- Coated \( n=397 \): 60 (15.1%)
- Uncoated \( n=393 \): 112 (28.5%)^*

*p=NS  ^p<0.001
Spasm and Response to Vasodilators
Entrapment
Consequences of Spasm and Eversion

A Novel Nonpharmacologic Technique to Remove Entrapped Radial Sheath

Samir B. Pancholy, MD, FACP, FACC, FSCAI, Poorna Rajasekhar Karuparthi, MD, and Rajiv Gulati, MD, FACC, FSCAI

Pancholy S, Gulati R. CCI 2014
Management

- Sedate the patient and manage the pain
- More vasodilators
- Apply hot towels throughout the length of the arm
- Slowly pull the catheter
- Flow-Mediated Vasodilation Technique (Clamp and Release)

Call Anesthesia

Regional brachial plexus block
Hematoma or Swelling? your best friends
Then the hand looks like this!!!
• Early recognition
• Wrap potential bleeding site
  – If seen on angiogram
  – If wire pushed too hard
• Okay to wrap and finish case
• Forearm swelling not related to hemostasis device at any time, consider wrap with elastic bandage

Monitor for Compartment Syndrome
Compartment Syndrome

Tizon-Marcos H., Barbeau G. J Interven Cardiol 2008;21:380–4
Compartment Syndrome – Management

• If any complaint of pain, swelling, or induration in the forearm or arm:
  • Apply a pressure cuff at the site of induration.
  • Inflate cuff up to 15 mm Hg below the systolic pressure for 15 minutes.
  • Monitor arterial flow with oxymeter clamp; adjust cuff pressure to obtain signal.
  • Call the physician in charge.
    – If high blood pressure, consider intravenous medication to lower blood pressure.
    – If ongoing glycoprotein IIb/IIIa inhibitors, consider stopping.
    – If using recent heparin or low molecular weight heparin, consider partial reversal by protamine.
    – Consider analgesia.
• If persistence of swelling, pain, or induration after two inflations of 15 minutes, consider urgent surgical consultation.

Tizon-Marcos H., Barbeau G. J Interven Cardiol 2008;21:380–4
Perforation

Balloon Sealing

A

B

C

D

Rigatelli G et al. JACC Interv 2009;2:1158-9
A 5-Fr diagnostic catheter inserted into and through a 7-Fr guiding catheter and over a 0.035 inch standard J-tip
Razor Effect – Balloon Assisted Tracking

(A) Razor effect

(B) Balloon-assisted tracking

Patel T, et al CCI 2012
Balloon Assisted Tracking

GUIDING CATHETER  
PTCA WIRE

GUIDING CATHETER  
PTCA BALLOON  
PTCA WIRE

Patel T, et al CCI 2012
Be Careful when Navigating Tortuosity

It is okay to take a shot, make sure you are not against the wall.
Always be Careful

Never push the wire against resistance
Radial Access Site Inflammation
Sterile Inflammation

- Incidence 1.6%
- Associated with hydrophilic-coated sheath
- Absence of infectious agent
- Appears 2-3 wks post-cath
- Granulomatous reaction

One other trick to try is to place two or three bands, one on the site, one distal and one proximal, occlusive, to guarantee flow cessation.

One TR band on the site itself may not have been consistently occlusive

– Dr. Samir Pancholy

Incidence of less than 0.1%

Liou et al, J Invasive Cardiol 2010; 22: 293-295
Always be Careful when Cannulating the Coronaries
Always be Careful from the Wrist or the Groin!
Always be Careful from the Wrist or the Groin!
Conclusions

• TRA complications are uncommon
• Always be careful
  – However, if you do enough...
  – Complications will happen
• Never lose your cool – Most complications described
• There are solutions to navigate problems
• Online consultation resources exist to discuss with experts and share experience