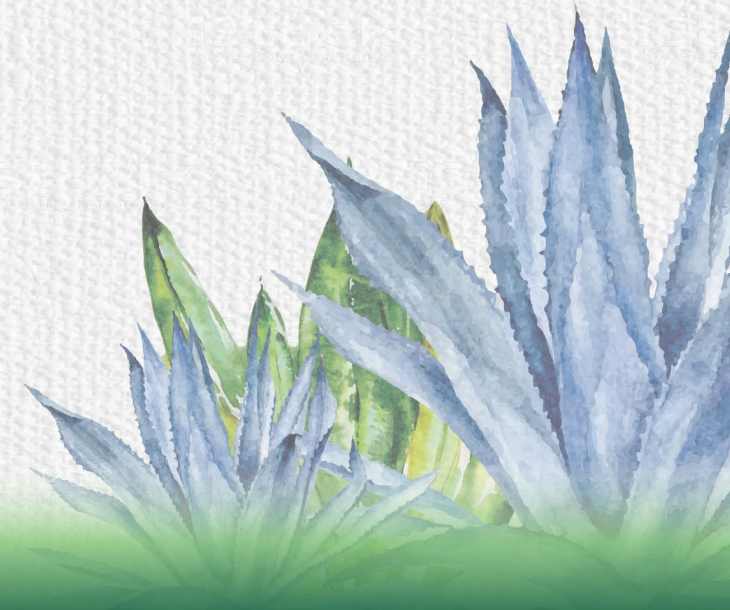


Radial (Proximal & Distal) and Cubital access When and How? Tips to avoid complications

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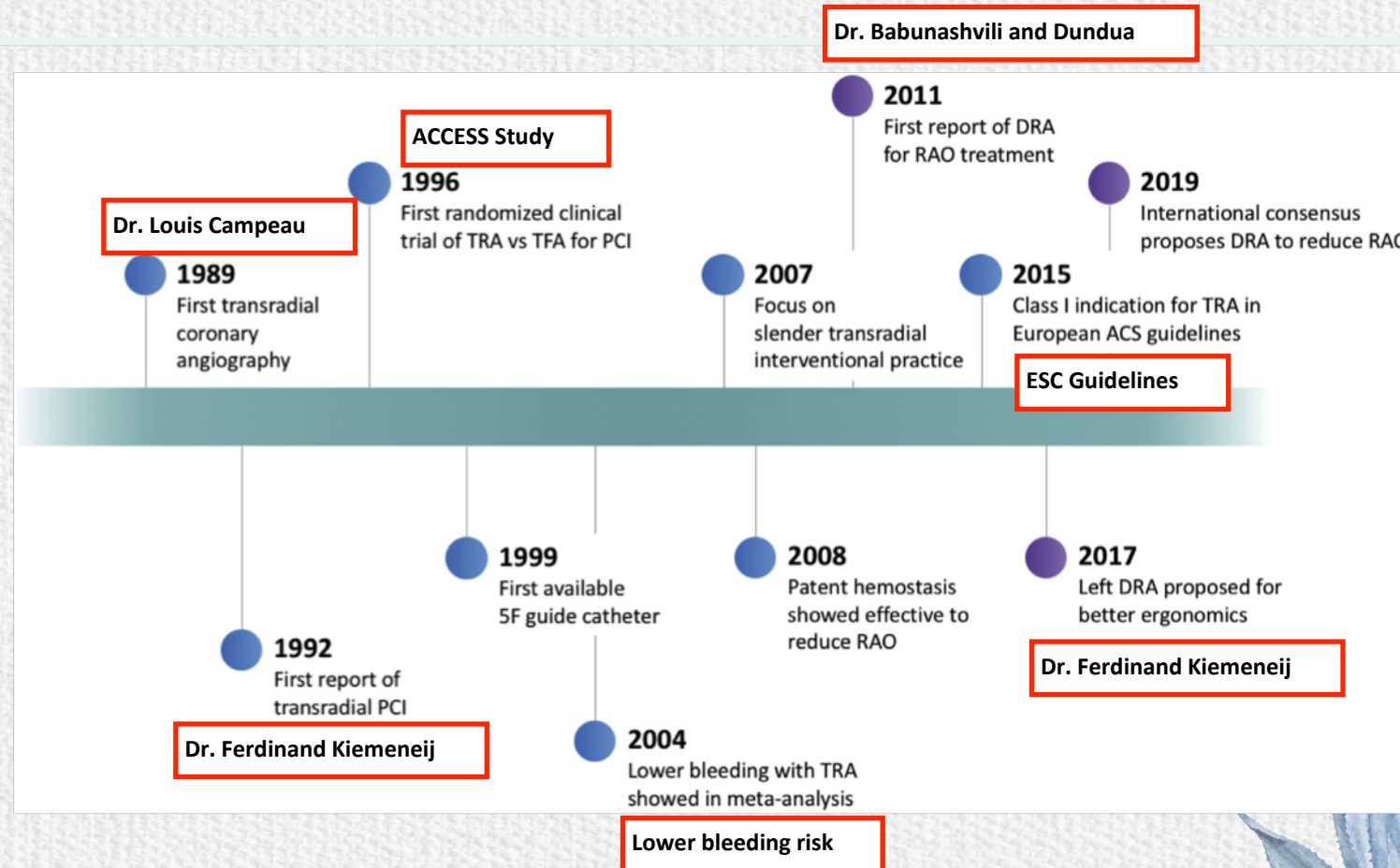


Introduction:

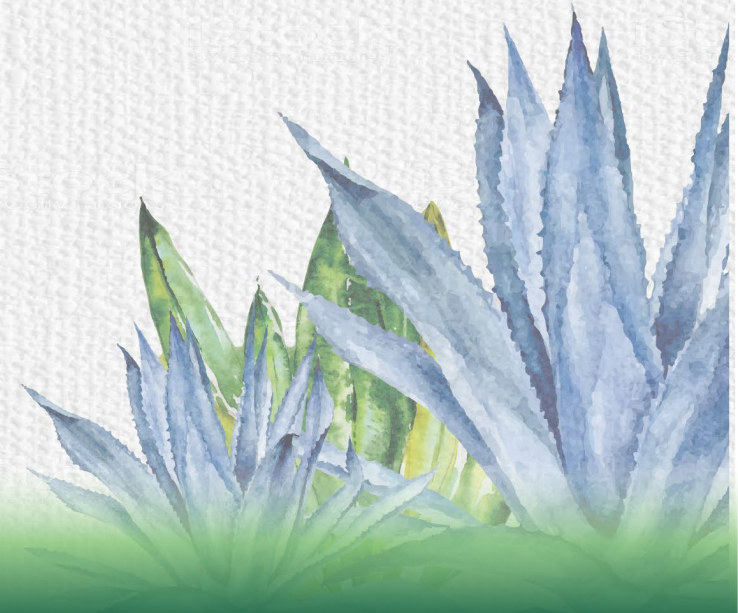
- The radial artery has become the **default access site** for coronary angiography and intervention
- European and American guidelines endorse a “**radial first**” **strategy (Class of Recommendation I, Level of Evidence A)**, whenever feasible and regardless of clinical presentation, to be performed by proficient operators
- The use of the radial artery, compared with the femoral artery, is associated with **lower risks of mortality, major adverse cardiovascular events, access site related major bleeding and vascular complications**
- Is **preferred to femoral access by the majority of patients**; it allows immediate mobilization, favours same-day discharge and is, therefore, a **cost-saving intervention** compared with femoral access

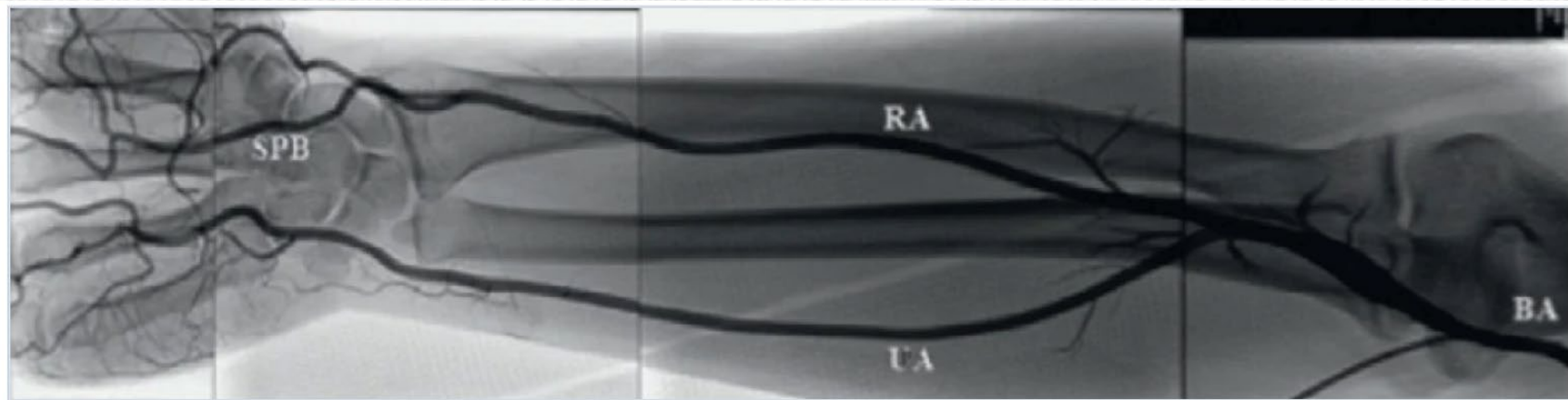


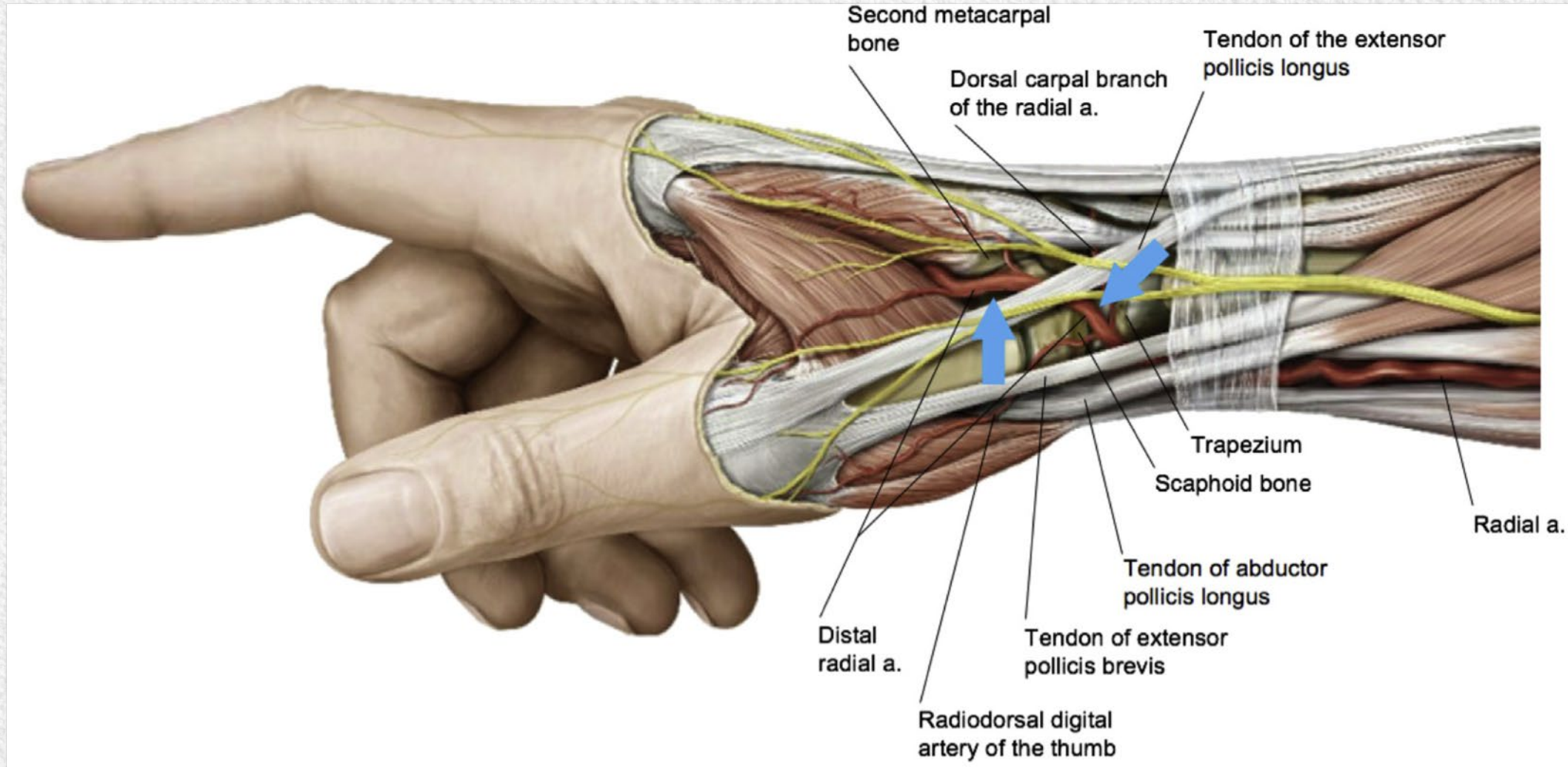
Milestones in Transradial Interventional Practice

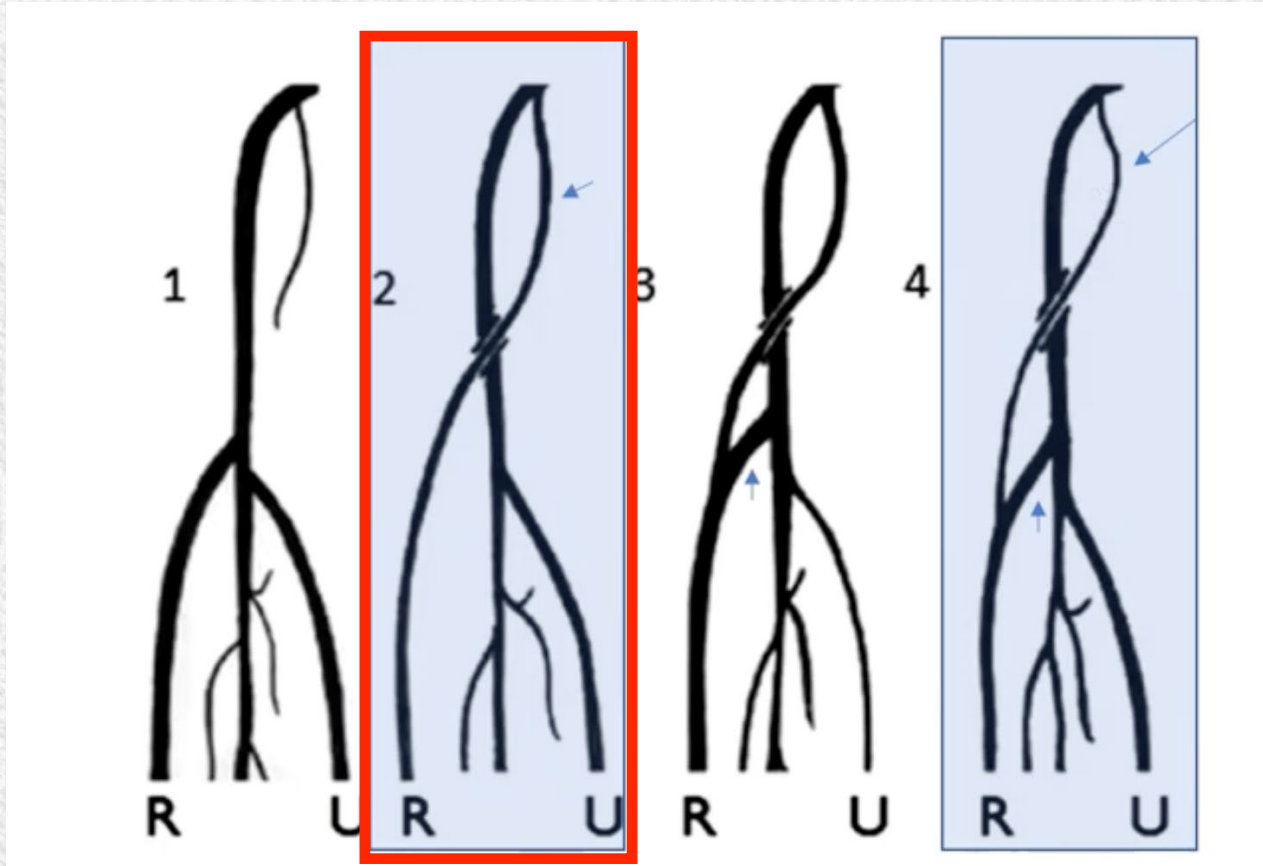


1. Anatomy of radial artery and arterial system of the hand
2. Proximal, distal, cubital
3. Radial access step by step
4. Complexities and complications
5. Scientific evidence in support of radial access









- Type 1, 3 and 4: Radial access feasible
- Type 2: High branching radial artery (arising from axilar artery): Not feasible



Proximal, distal, cubital

1. Distal radial & ulnar access:

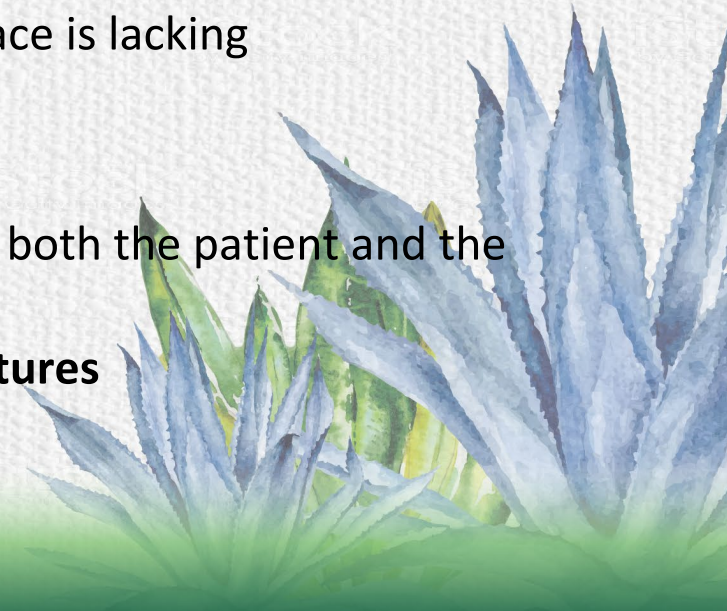
1. When **radial artery occlusion risk reduction is a priority**
2. Need to preserve proximal radial artery for **future procedures**, dialysis fistulas or CABG

2. Ulnar access:

1. **Radial known anatomic issues** (small diameter, radial stenosis with calcification, tortuosity, **small pulse**)
2. Deeper, close to the homonymous nerve and an effective compression surface is lacking

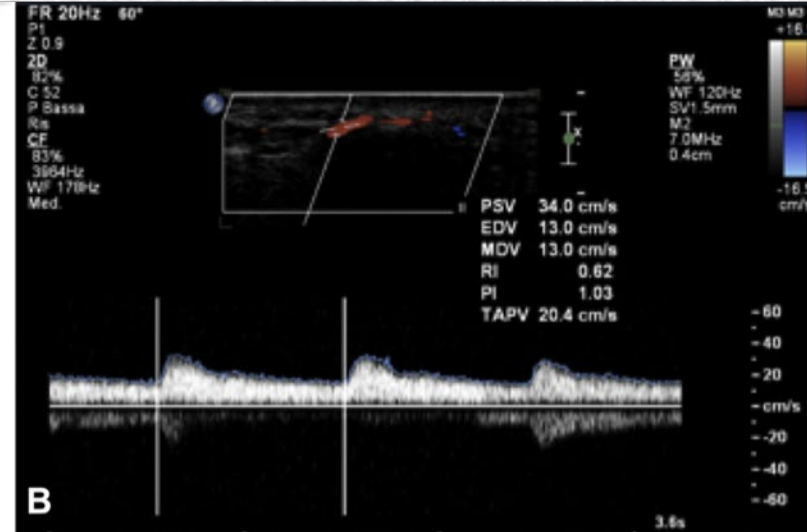
3. Distal radial:

1. LdRA: left hand close to the right groin in such a way that is **comfortable** for both the patient and the operator
2. Alternative puncture site **when spasm occurs because of failed p-TRA punctures**

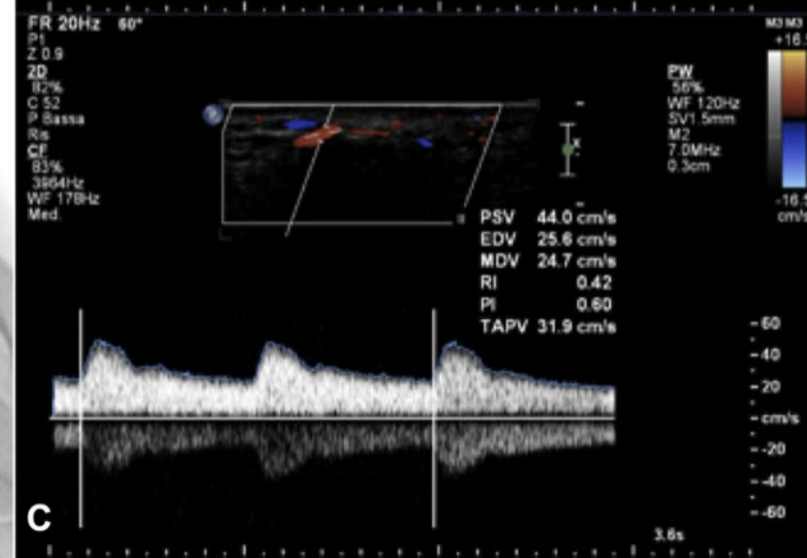




A



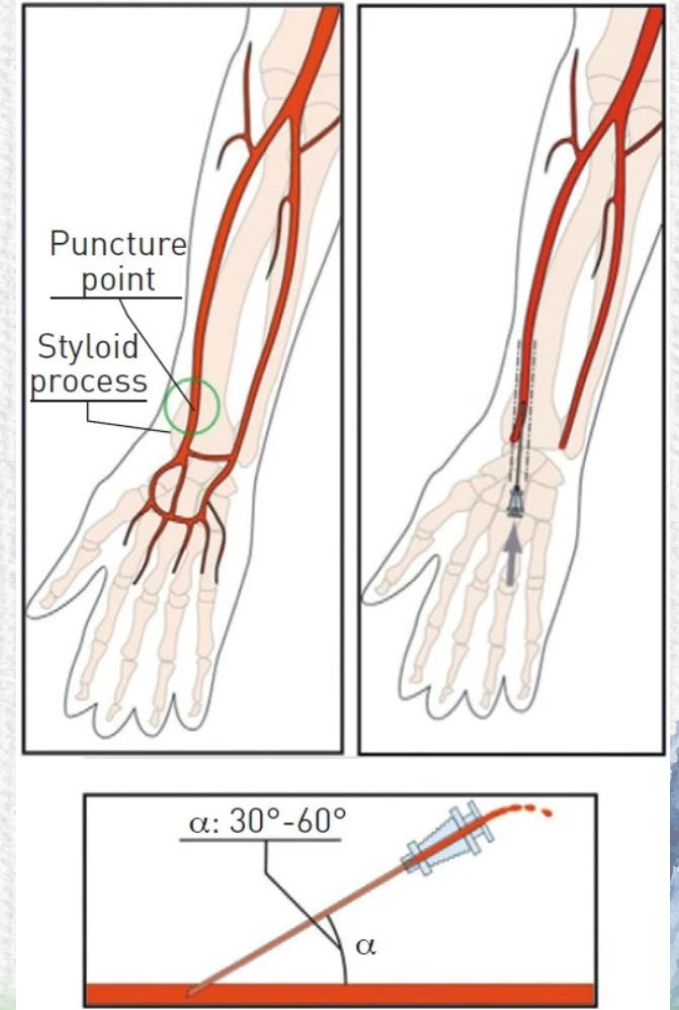
B



C

Radial Step by Step

1. Palpation of radial pulse
2. Sterile preparation
3. US guidance (if needed)
4. Local anesthetic
5. Radial artery puncture
6. 0.018 inch guidewire insertion
7. Skin nick (if needed)
8. Sheath insertion + aspiration/flushing
9. Securing the sheath (if needed)

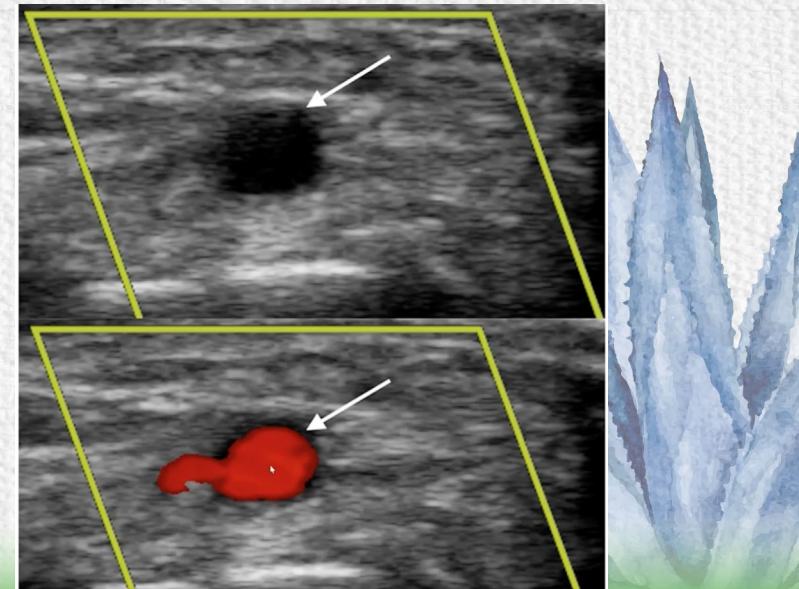
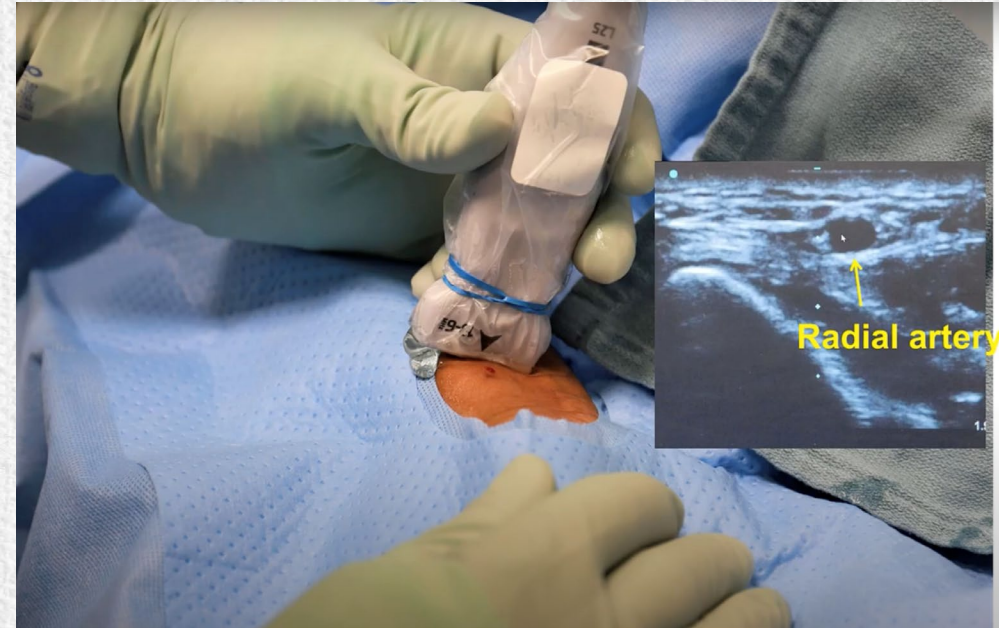


- p-TRA & ulnar access:
 - Patient supine
 - Wrist extended
- d-TRA:
 - Right: neutral position with its lateral side facing superiorly
 - Left: at patient's groin or left arm at 90*



When to use US

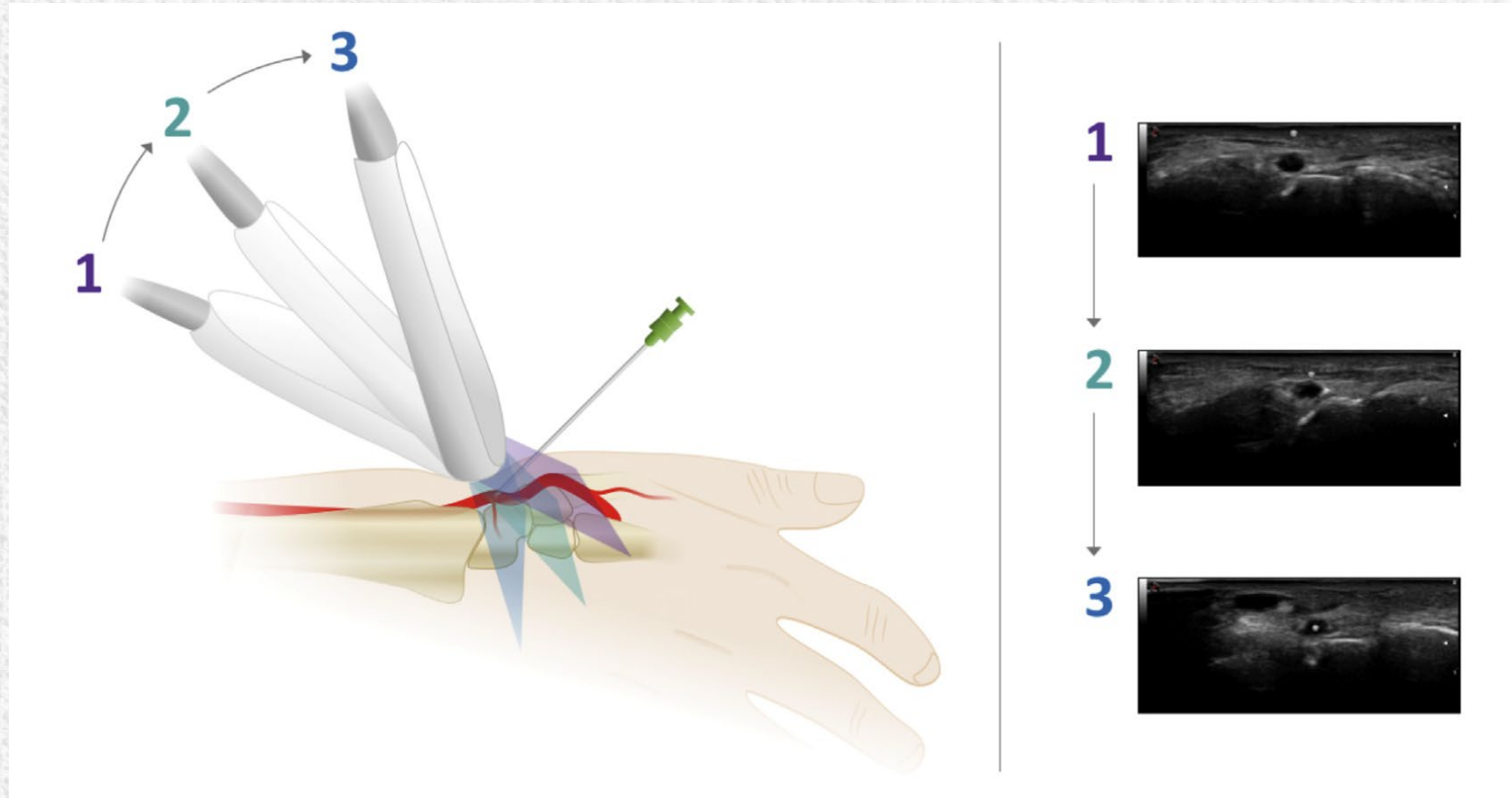
- Weak or non-palpable pulse
- Key Benefits of Using US:
 - Real time visualization
 - Confirms artery vs. vein
 - Confirms patency (color Doppler)
 - Reduces risk of posterior wall puncture
 - It's helpful for teaching (demonstrate anatomy and needle tip control)
- **Improves first puncture success, reduces time to access and vascular adverse events**



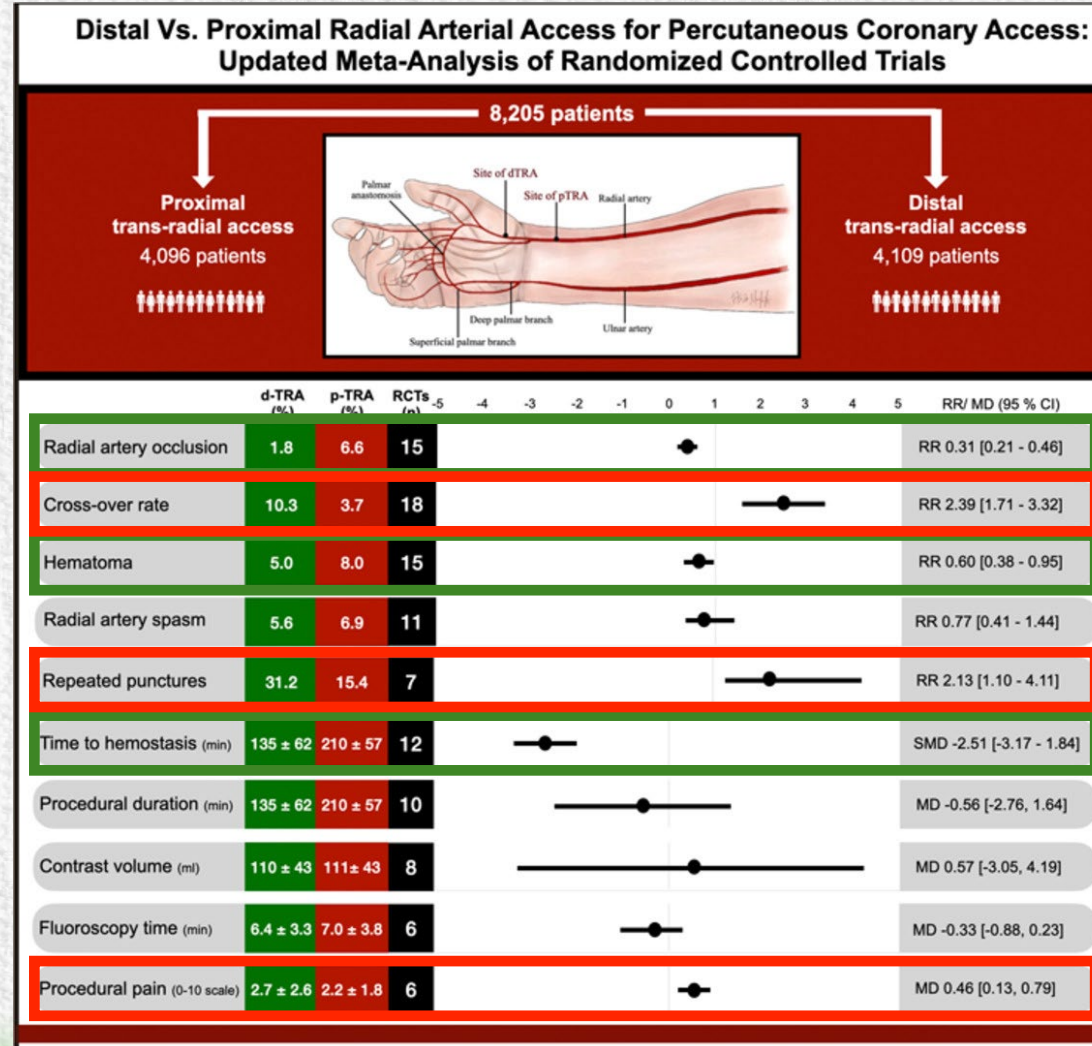
Moussa PH et al. AM Heart J 2018

When to use US

- US in d-TRA:
 - Improves puncture success from 87% to 97%



Meta-analysis of RCT p-TRA vs d-TRA



d-TRA better

p-TRA better

Front wall stick



Double wall “through and through” stick

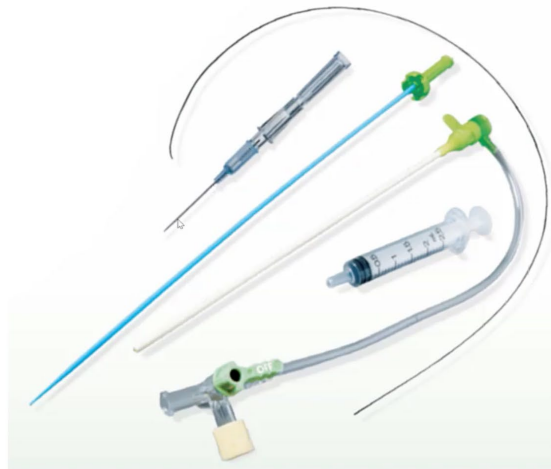
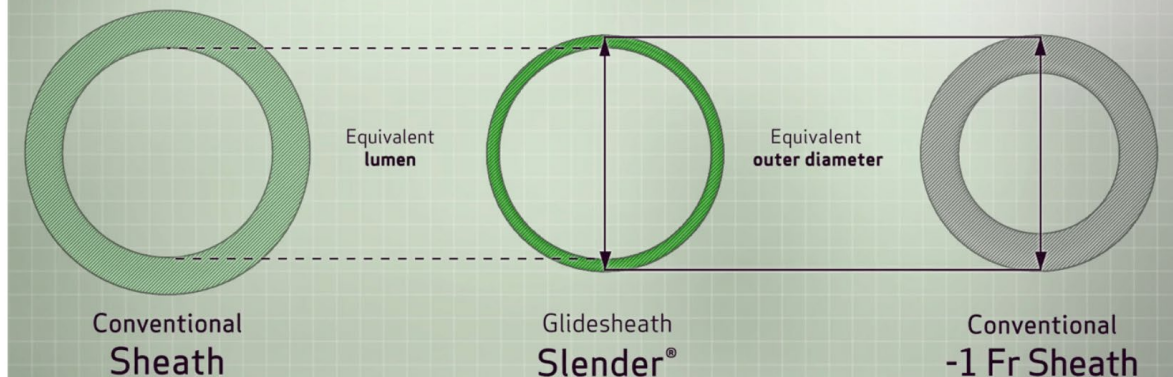
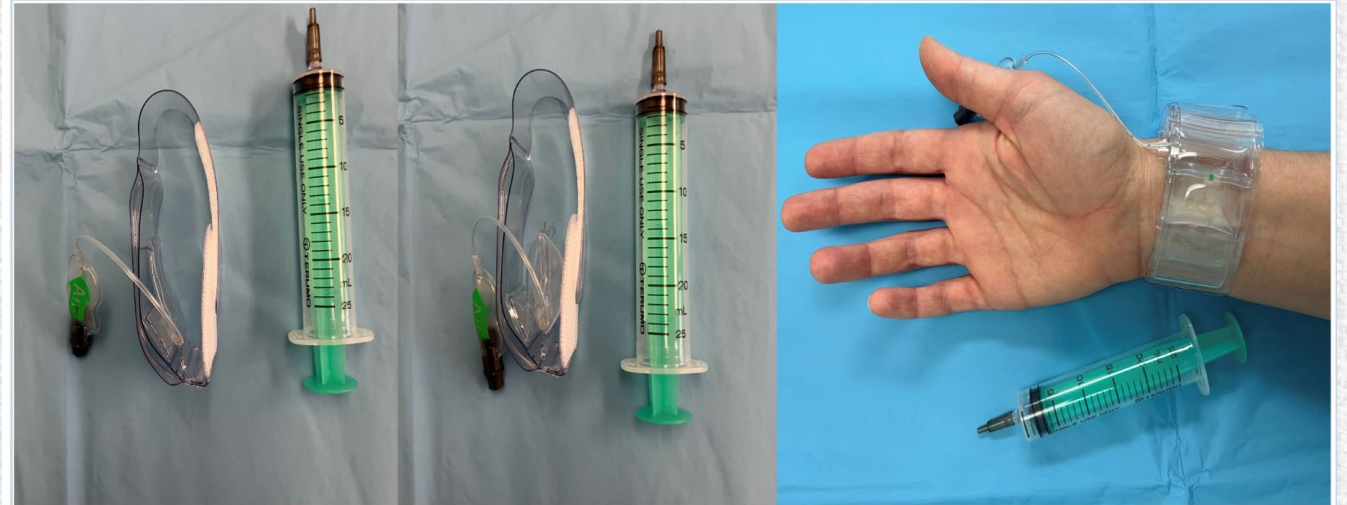


Table 1: Sheath Size by Radial Artery Diameter

Introducer Sheath	Ideal Radial Artery Diameter (mm)
5 Fr slender radial	1.6
5 Fr regular radial	1.8
6 Fr slender radial	2.4
6 Fr regular radial	2.6
7 Fr regular radial	3.1

Thin-wall technology





Elastic hemostatic
bandage



Adhesive hemostatic
pressure pad



Classical radial
compression device

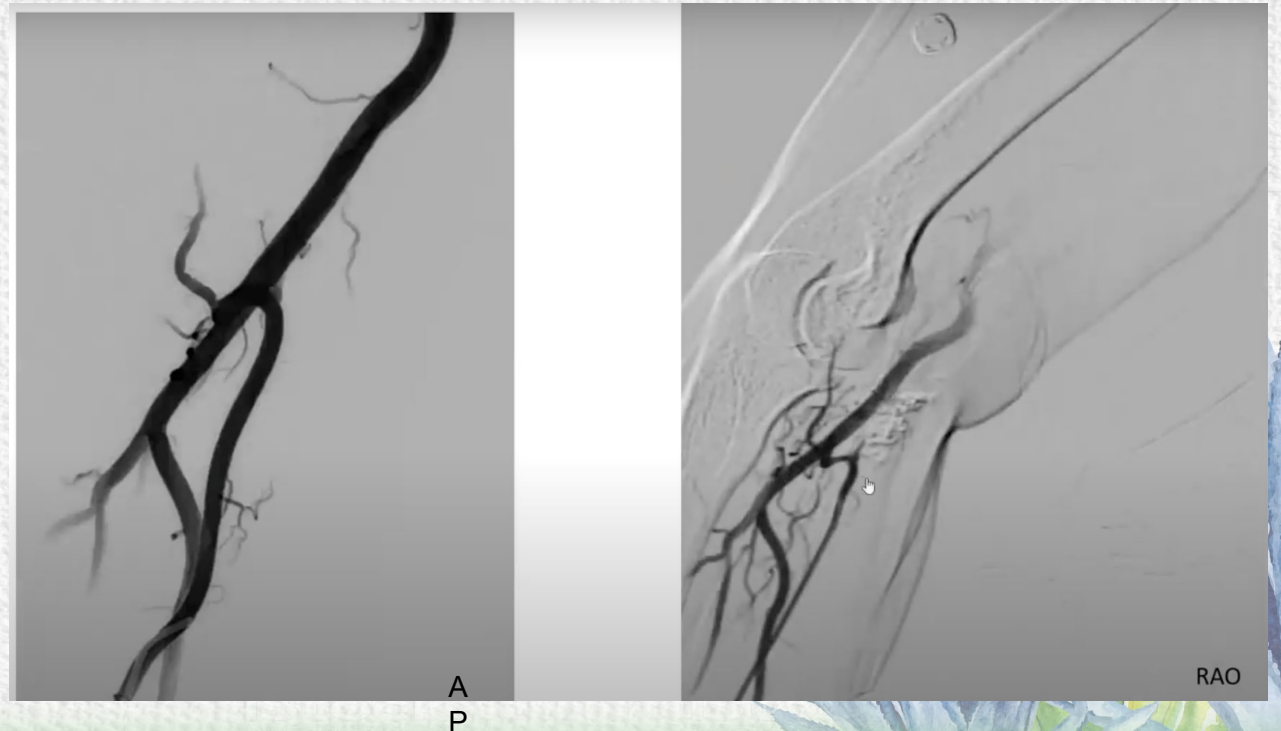


Dedicated distal radial
hemostasis device



Complexities and complications

- **When soft J wire does not advance:**
 - Try Roadrunner angled wire or Wholey Floppy wire under fluoro
 - Give NTG/Verapamil if radial artery spasm
- Substraction angio with sheath:
 - Watch for loop, accessory small radial branches but also for perforation
- Try Roadrunner angled wire under fluoro



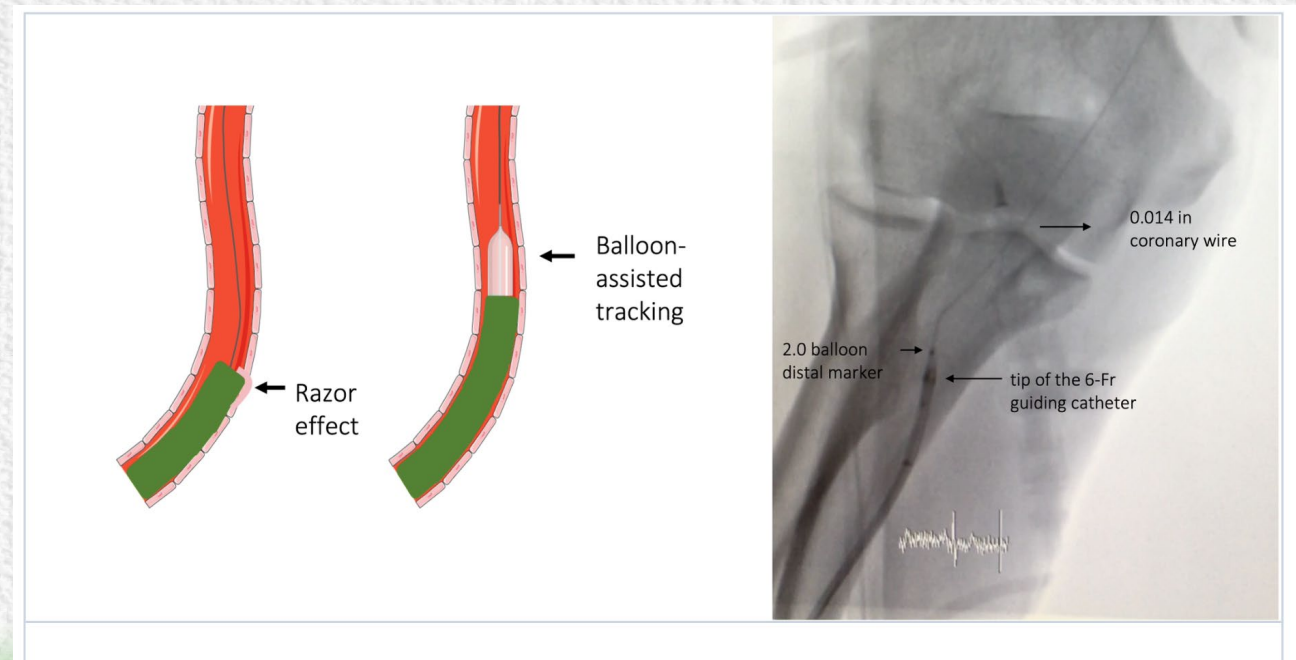
Radial Loops Techniques

- **0.014 - 0.018 wire technique:**

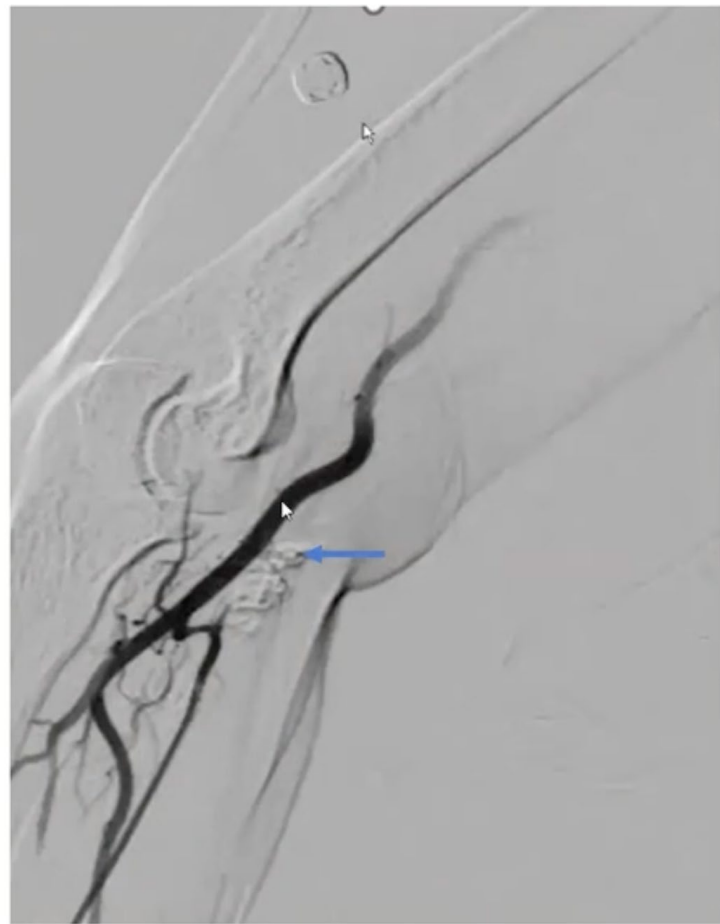
- Try 0.014 (BMW, Whisper) or 0.18 wire to advance through the loop
- Advance the softest 4-5 Fr catheter
- Exchange the 0.014 or 0.018 wire to 0.035 J wire (low or medium weight)
- Advance 6 Fr catheter

- **BAT (balloon assisted tracking):**

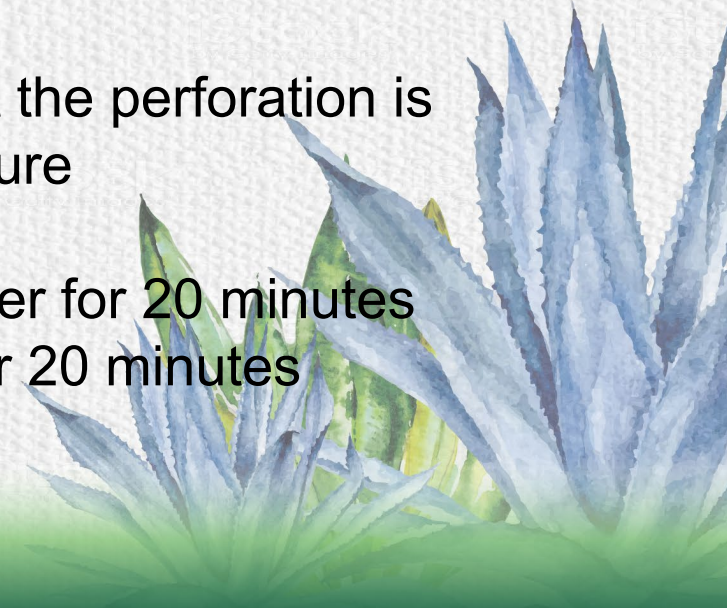
- When 0.035 crosses the loop but not the catheter
- Wire with a 0.014 and do BAT with 1.5 or 2.0 x 15 coronary balloon (keeps the catheter tip tapered and coaxial)



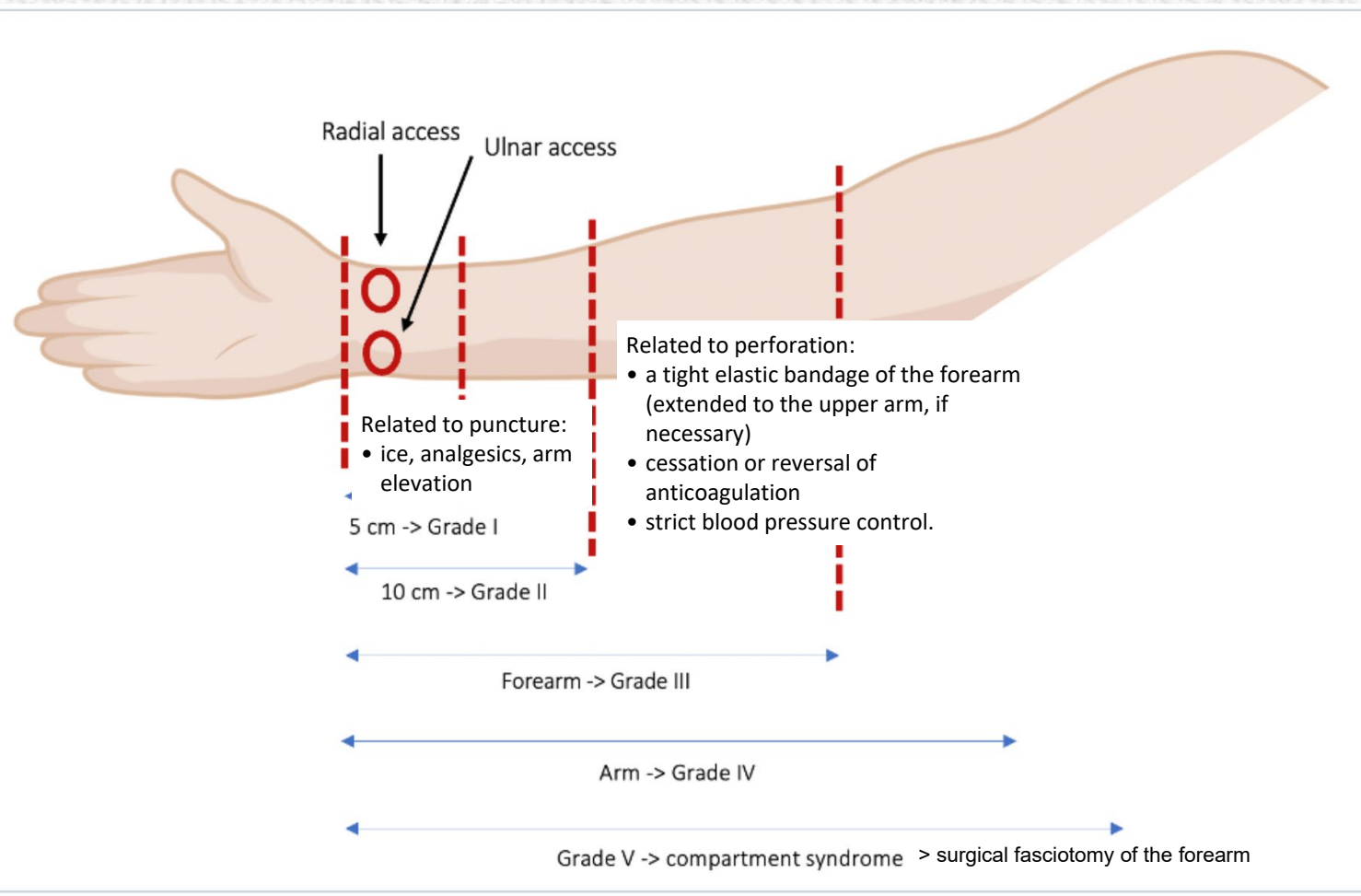
Perforation



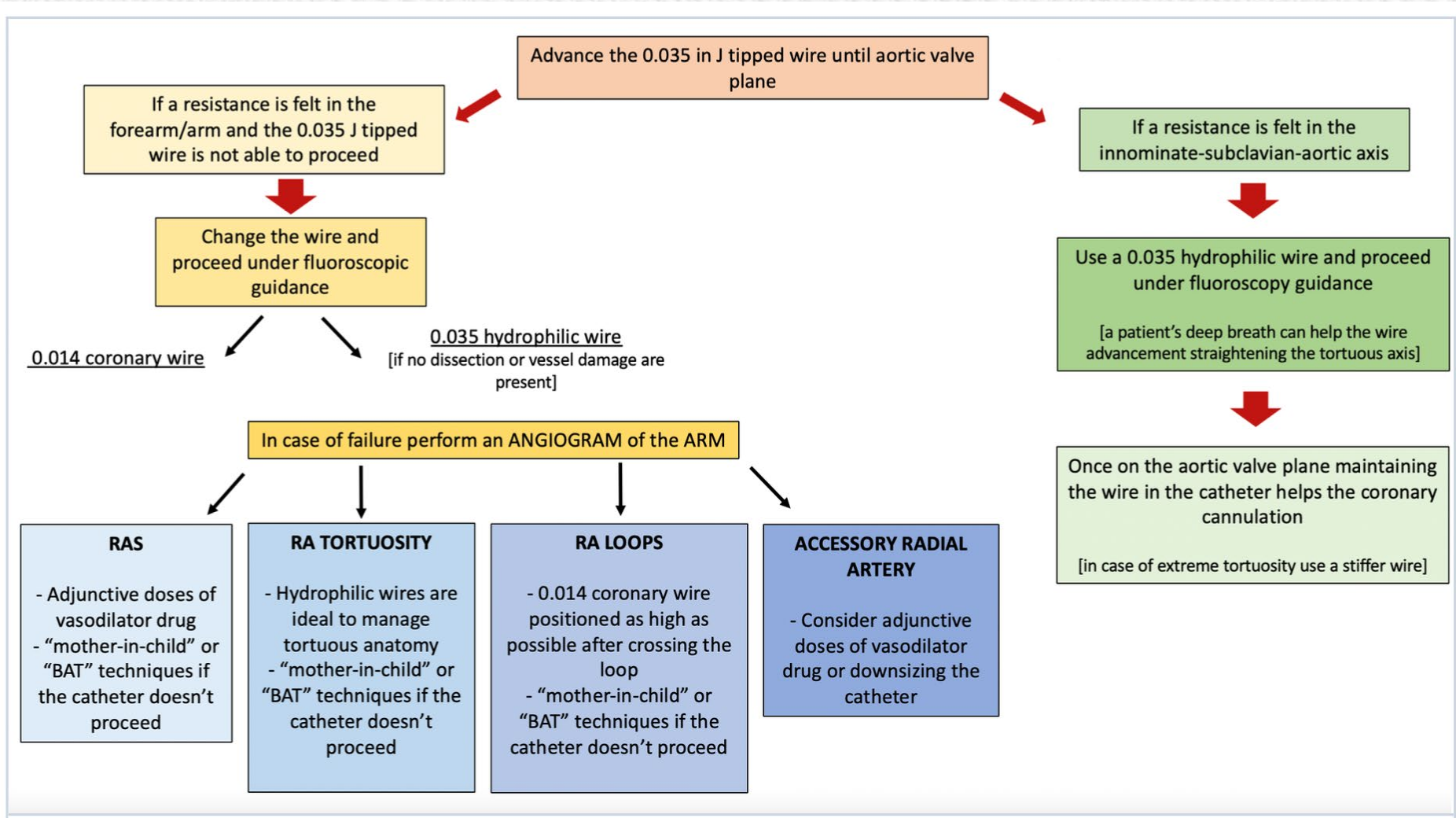
- Even if perforation happens, continue with attempts of trying to cross properly (the catheter itself will occlude flow across the small accessory branch)
- If big perforation: Inflate BP cuff for 10 minutes before reattempting to cross
- Repeat angiogram to verify that the perforation is sealed at the end of the procedure
 - If persists:
 - Advance guiding catheter for 20 minutes
 - Inflate 2.5 mm balloon for 20 minutes
 - Elastic bandage



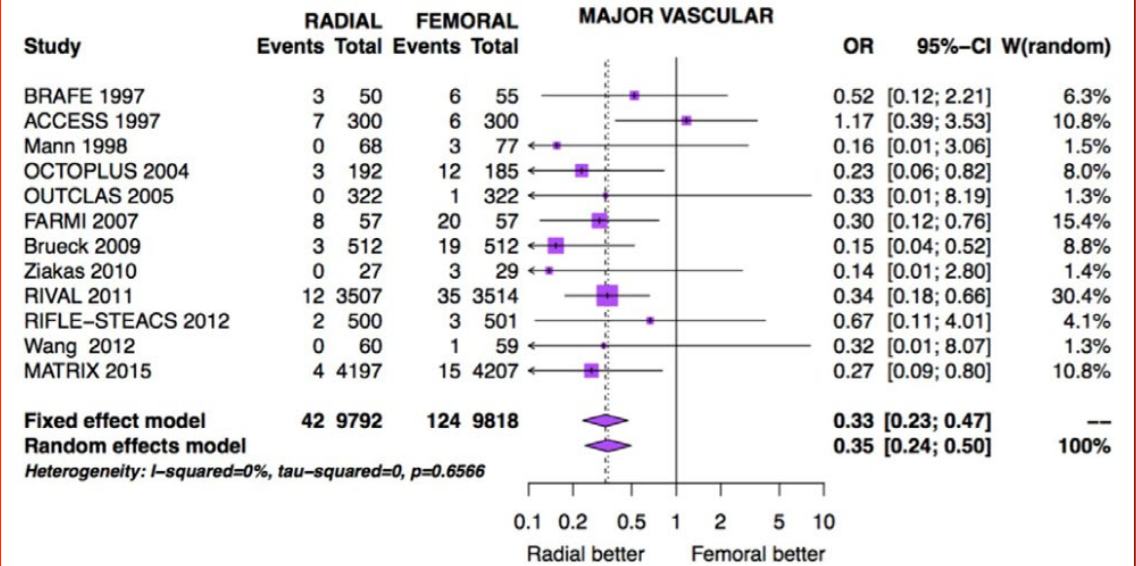
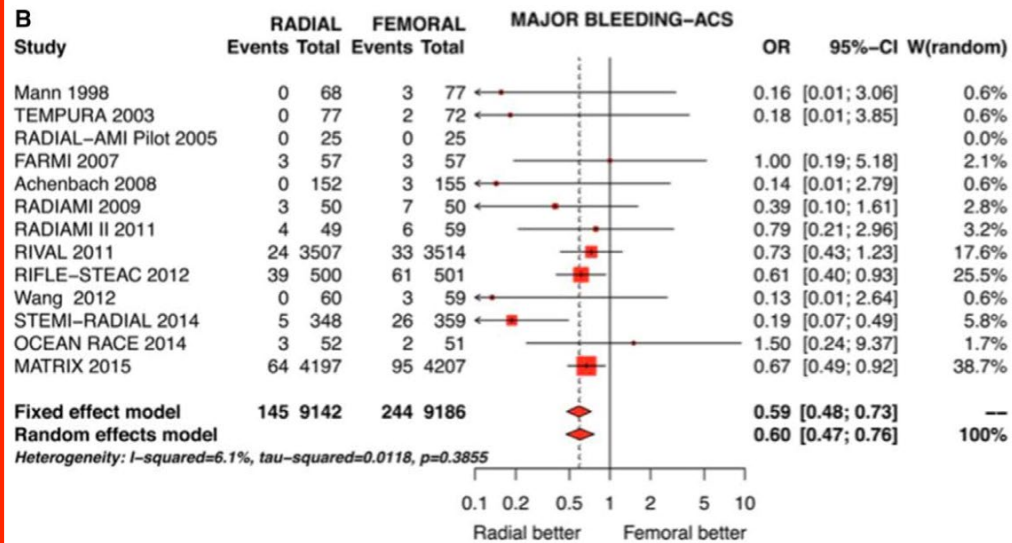
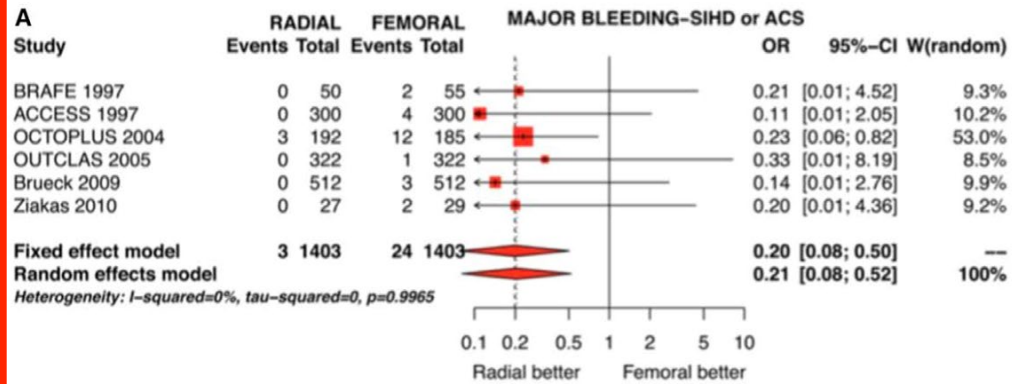
EASY (EARly Discharge After Transradial Stenting of coronary arteries) classification of the upper limb haematoma



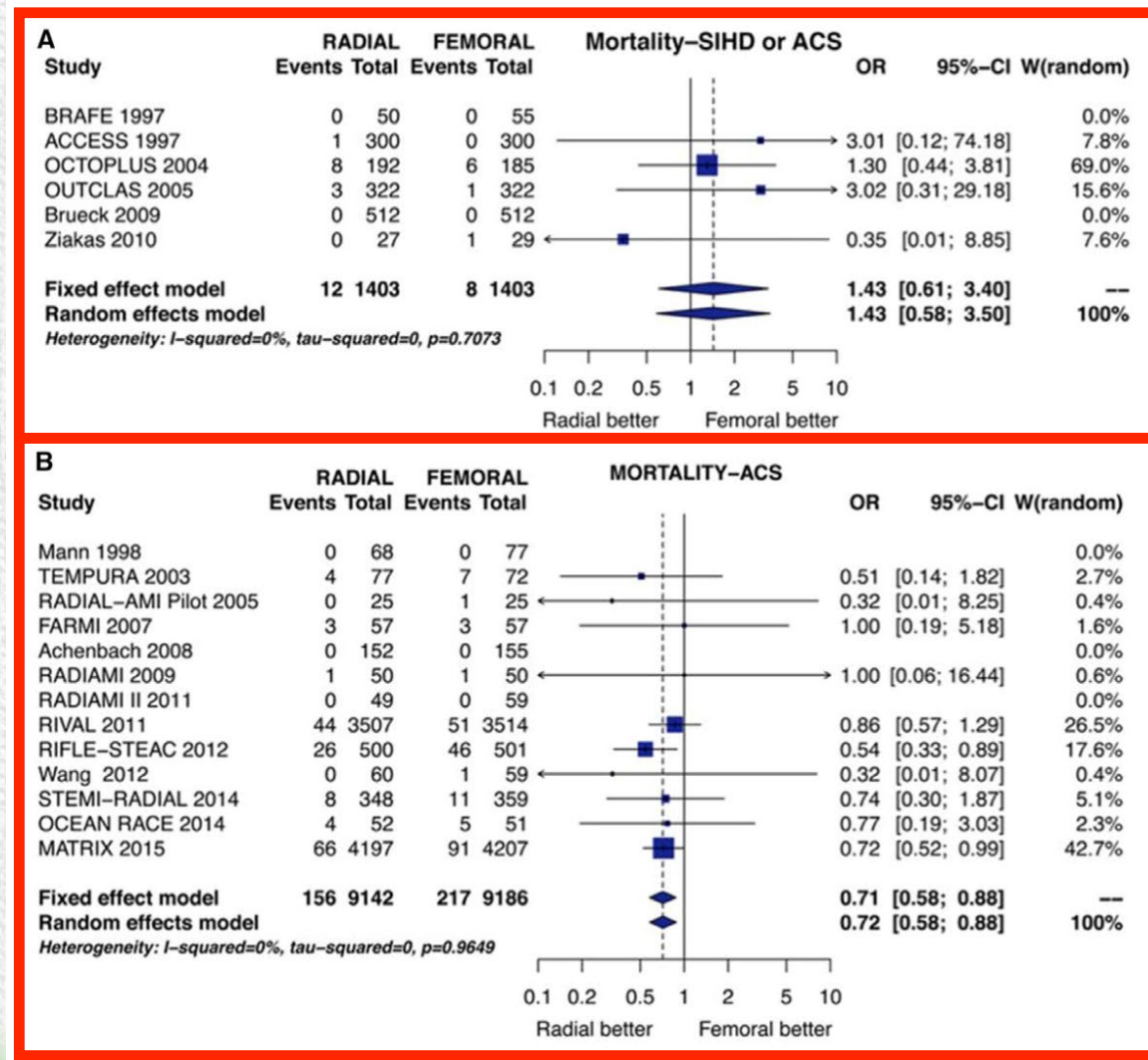
A practical algorithm for challenging anatomical situations



Evidence



Evidence



TAKE HOME MESSAGES

- A radial-first approach is strongly recommended in all patients
 - lower risks of mortality in ACS patients
 - lower risk major bleeding and vascular complications
 - preferred by the majority of patients
- d-TRA: to preserve proximal radial artery for future procedures
- Ulnar: effective in small radial pulse
- Ultrasound guidance facilitates radial vascular access

Thank you

