Radial Access, Angiography and Intervention

Shaheen Pandie

Radial vs Femoral

- RADIALIST

- 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)

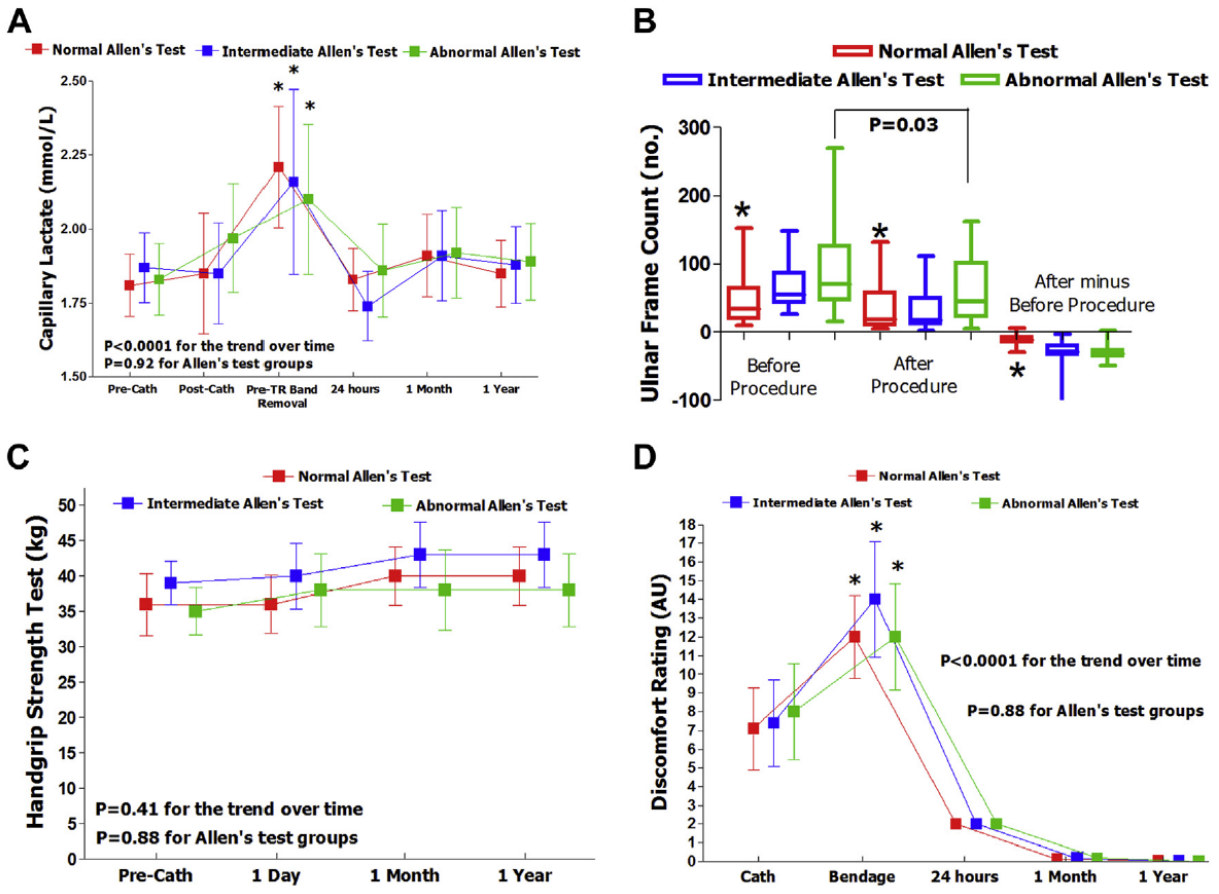


Figure 4 Thumb Capillary Lactate, Ulnar Frame Counts, Handgrip Stress Test, and Self-Reported Discomfort Rates Over Time Across AT Results

(A) The levels of thumb capillary lactate did not differ after compared with before catheterization (cath) irrespective of Allen test (AT) results obtained at baseline. Thumb capillary lactate peaked immediately before arterial bandage removal in all AT result groups. *$p < 0.002$ versus baseline values in post-hoc analysis. **(B)** Patients with normal AT results showed lower ulnar frame counts both before and after catheterization compared with patients with abnormal AT results. Ulnar frame count was significantly lower after compared with the value before catheterization in patients with abnormal AT results. *$p < 0.05$ versus patients with abnormal AT results in post-hoc analysis for the difference of ulnar frame counts after minus before catheterization. **(C)** Handgrip test at baseline and follow-up. **(D)** Self-reported hand discomfort rating after transradial catheterization.

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

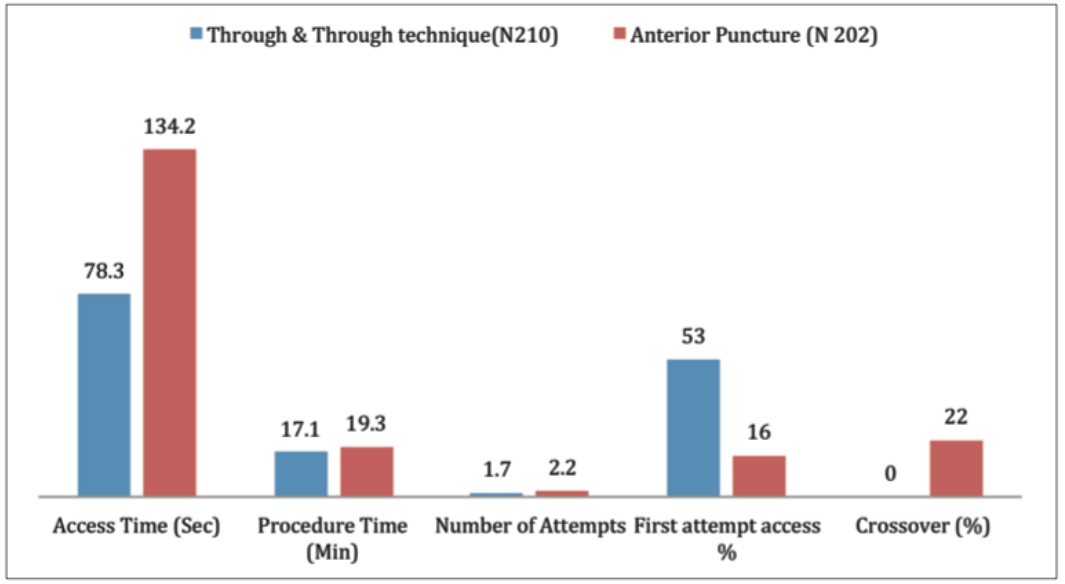
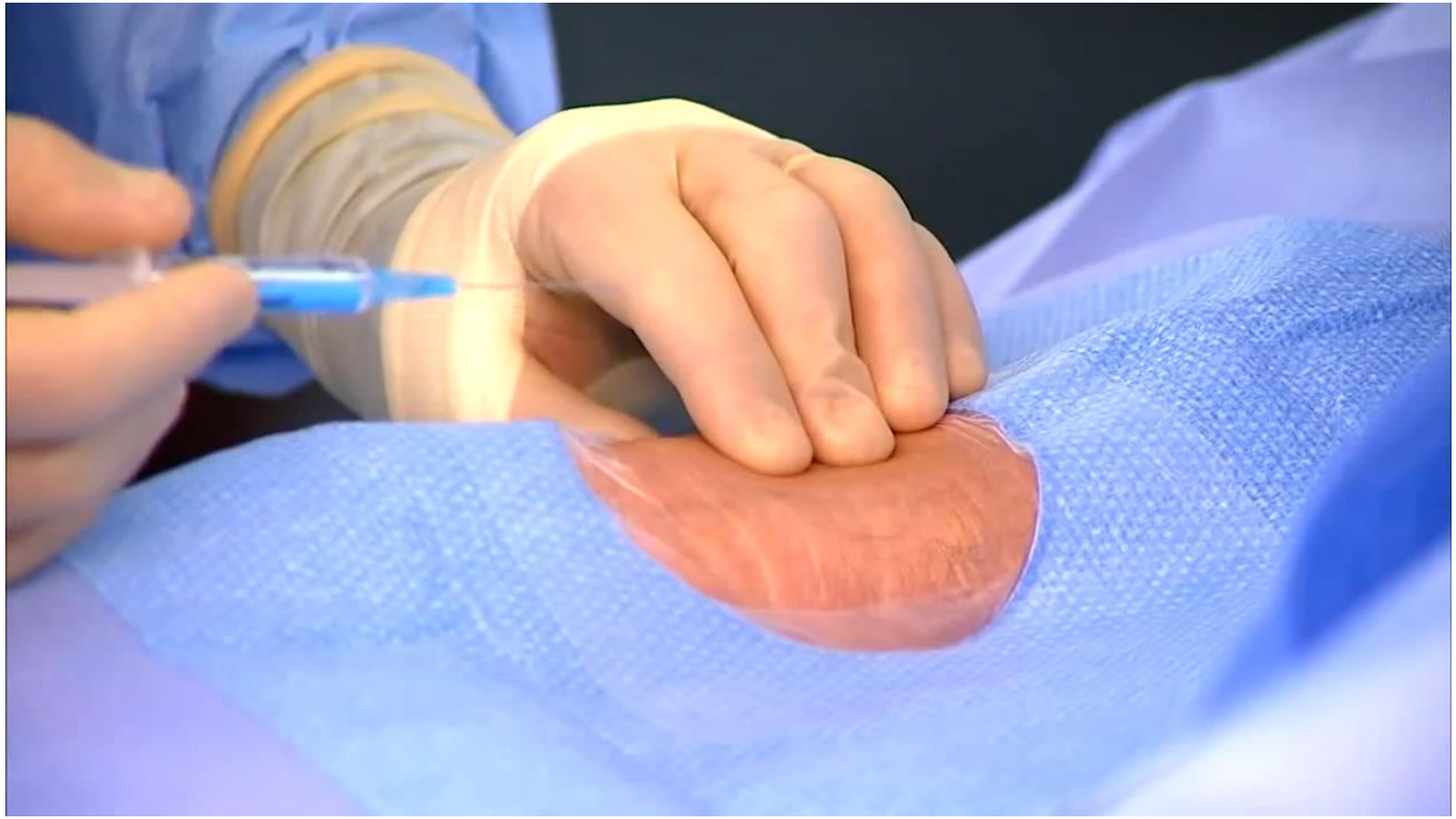


Figure 6. Radial Artery Access Technique Evaluation Trial.[3]

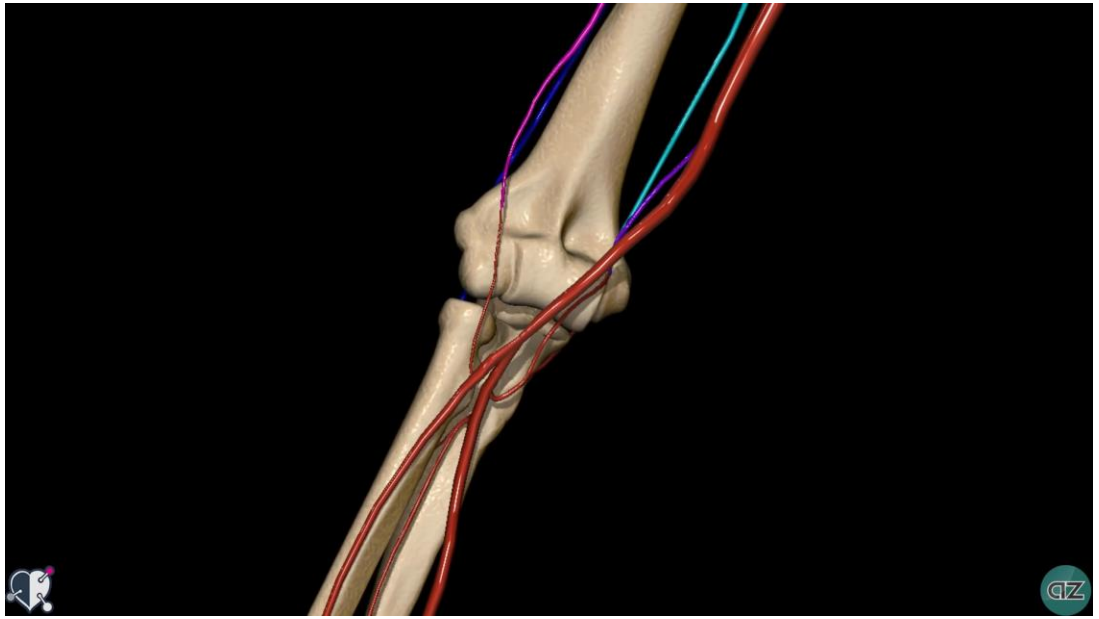
Catheter Cardiovasc Interv. 2012 Aug 1;80(2):288-91. doi: 10.1002/ccd.23445. Epub 2012 Mar 14.
Radial artery access technique evaluation trial: randomized comparison of Seldinger versus modified Seldinger technique for arterial access for transradial catheterization.
Pancholy SB[1], Sanghvi KA, Patel TM.

Puncture technique



Cocktails

Anatomy



Getting from puncture to engagement

Understanding anatomy

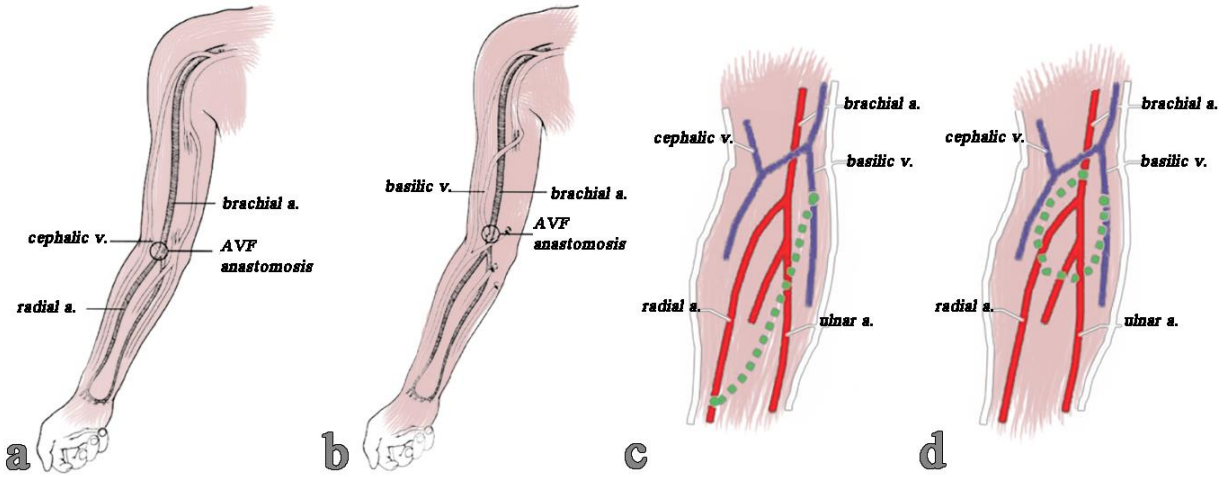


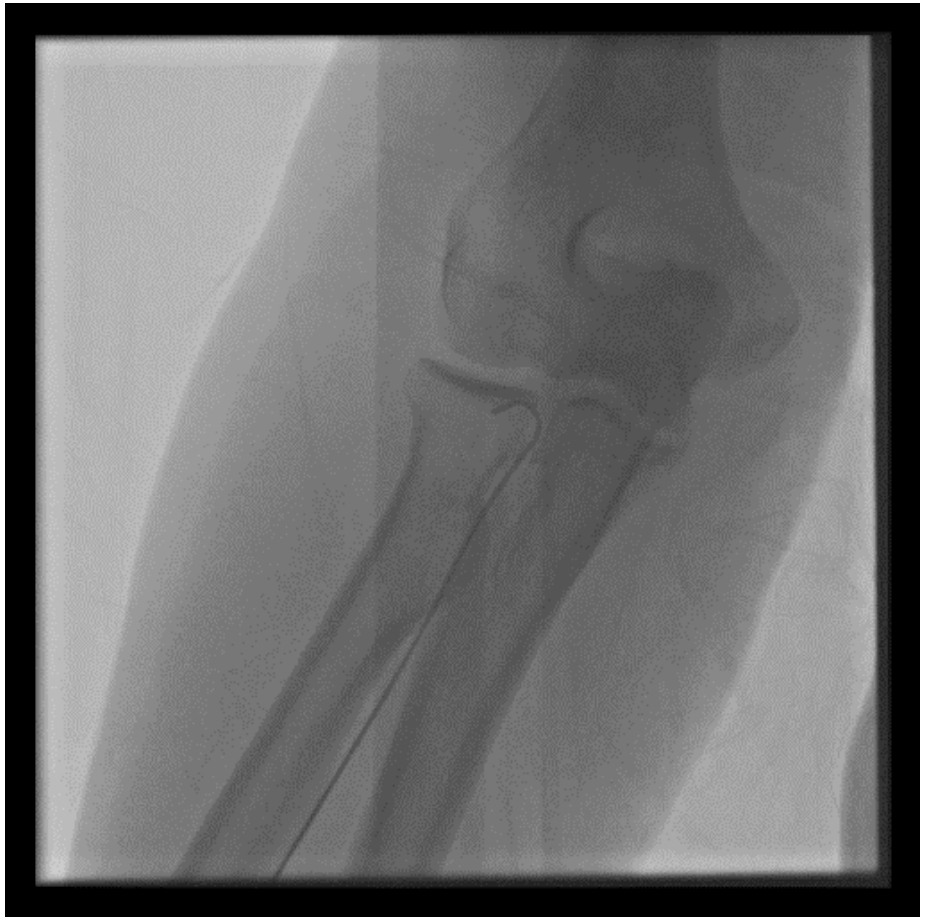
TABLE 3. **Classification of the Radial Artery Anatomical Anomalies in Our Patient Population***

	No. of cases (%)
1. Ectopic radial origin	22 (59%)
2. Radioulnar loop	6 (16%)
3. Radial tortuosity	4 (11%)
4. Radial bifurcation	3 (8%)
6. Radial hypoplasia	1 (3%)
7. Overdeveloped recurrent artery	1 (3%)

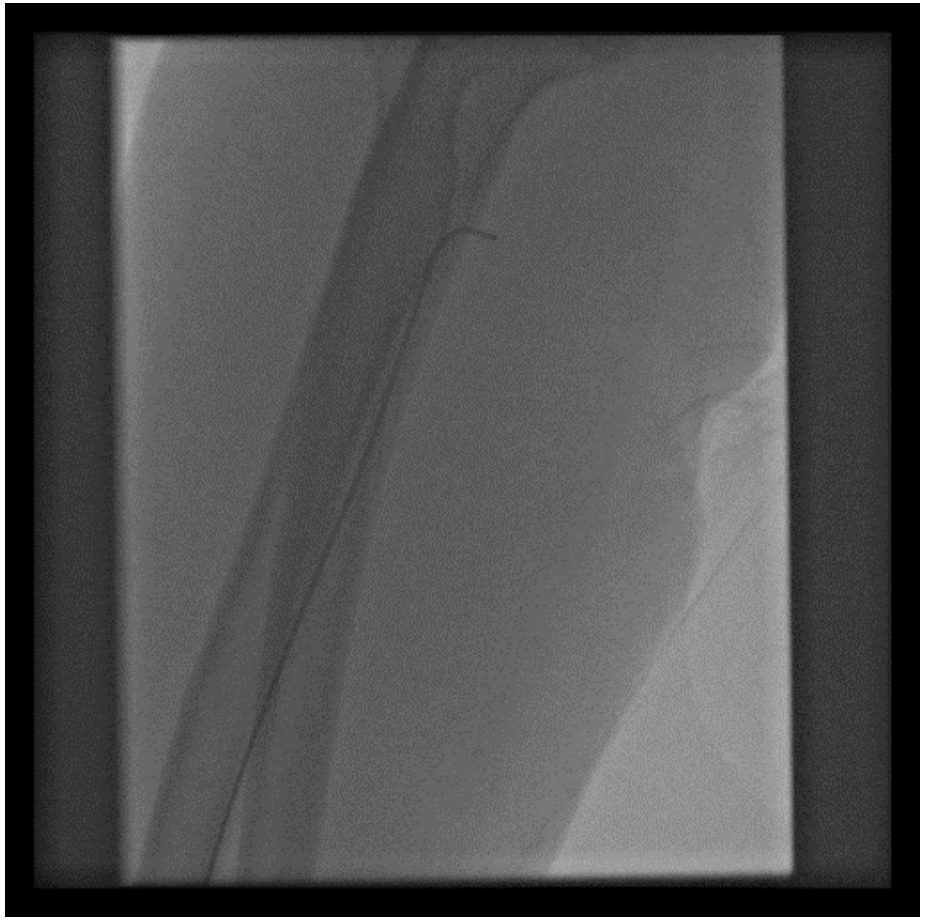
*Relative percentages of the total number of radial anatomical anomalies.

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

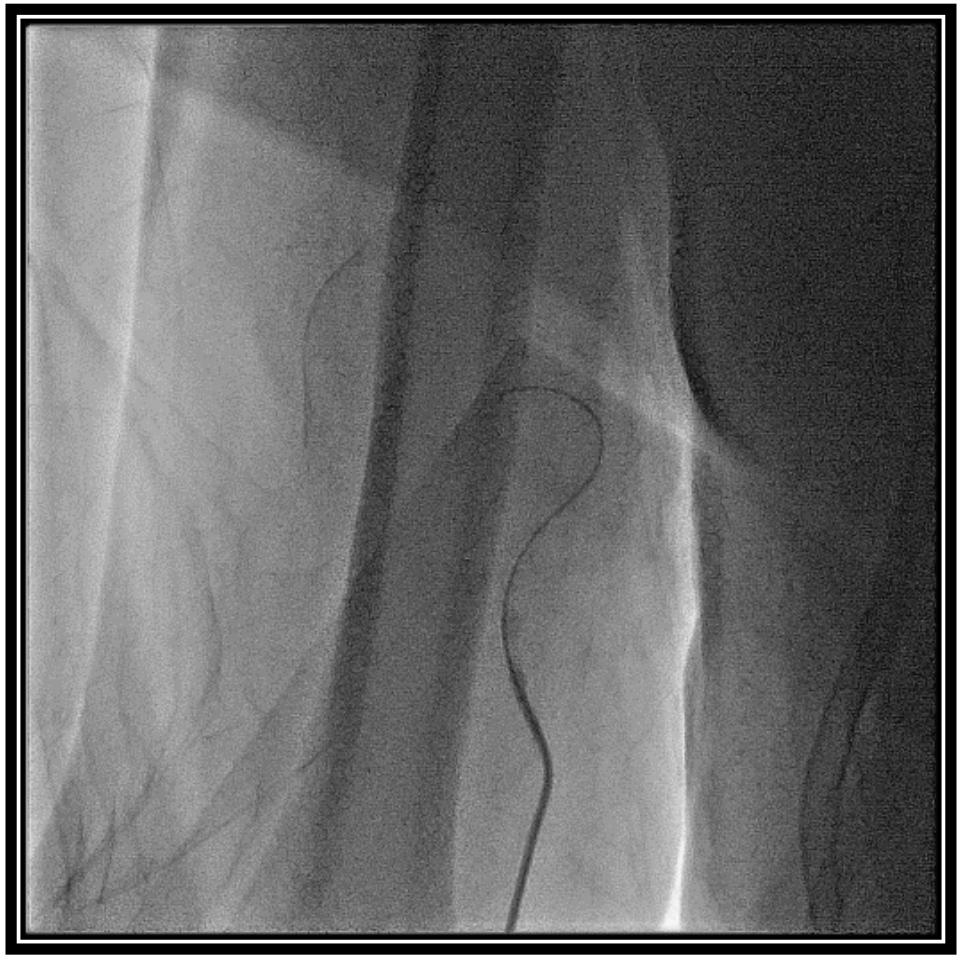


Radial to brachial



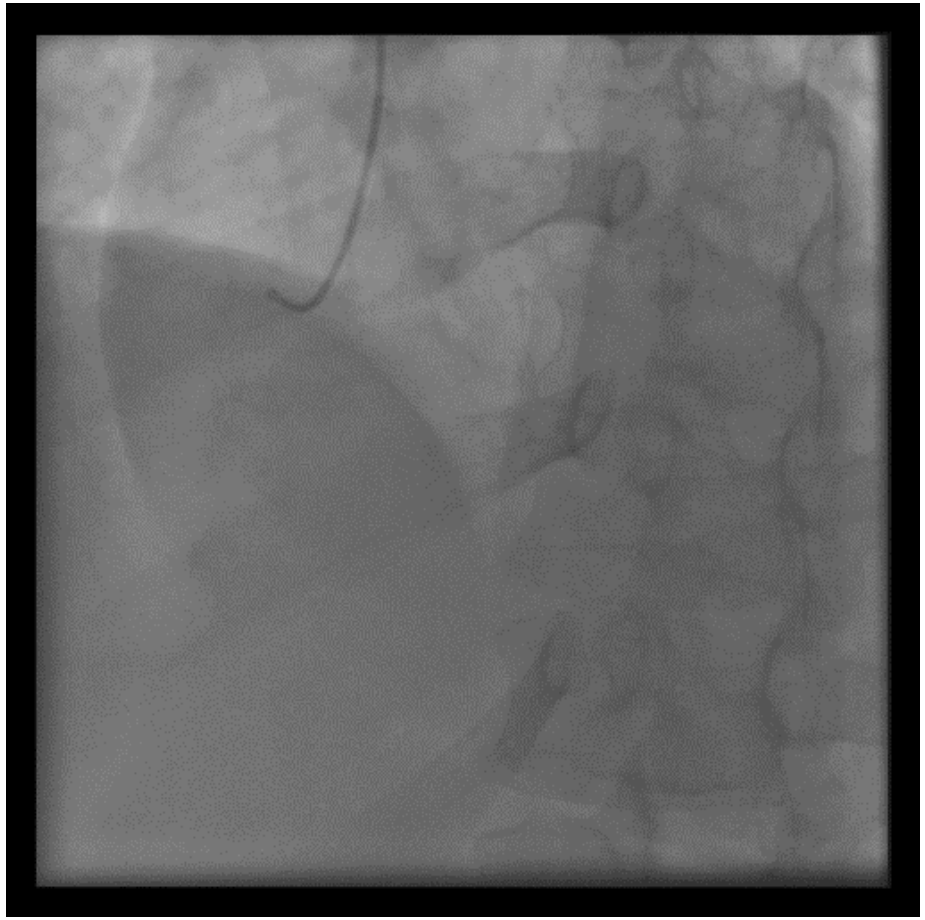
Radial to brachial

Radial to brachial



Radial to brachial

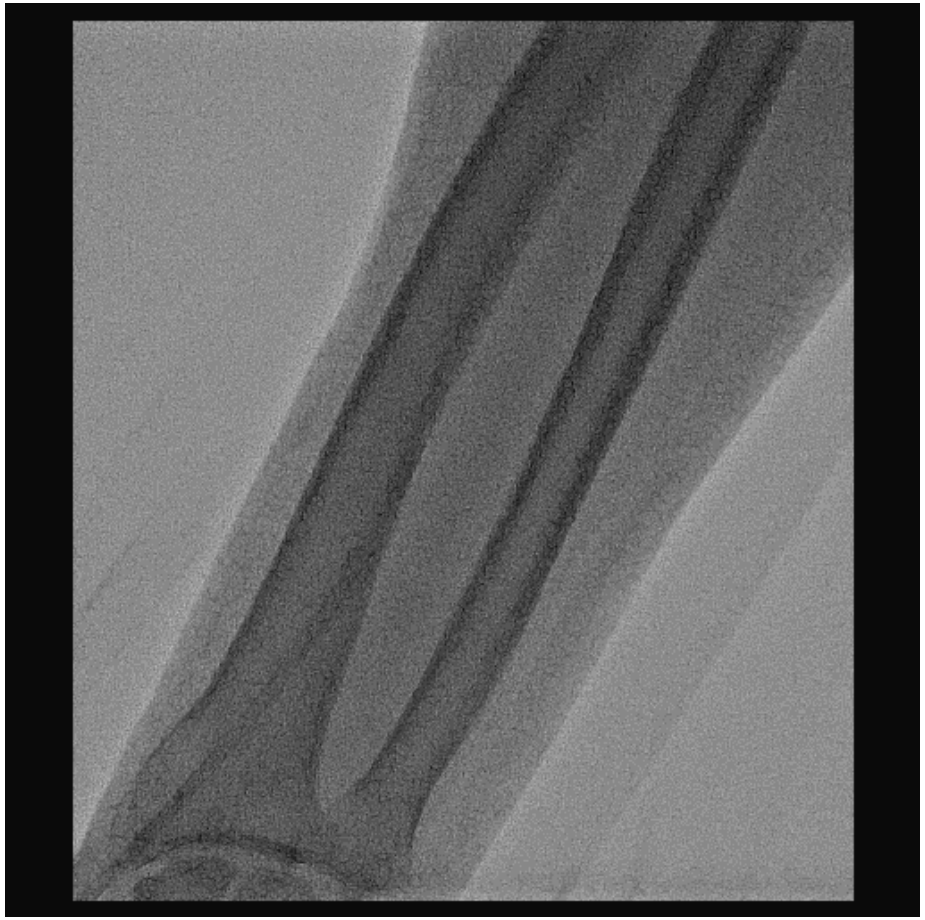
Radial to brachial

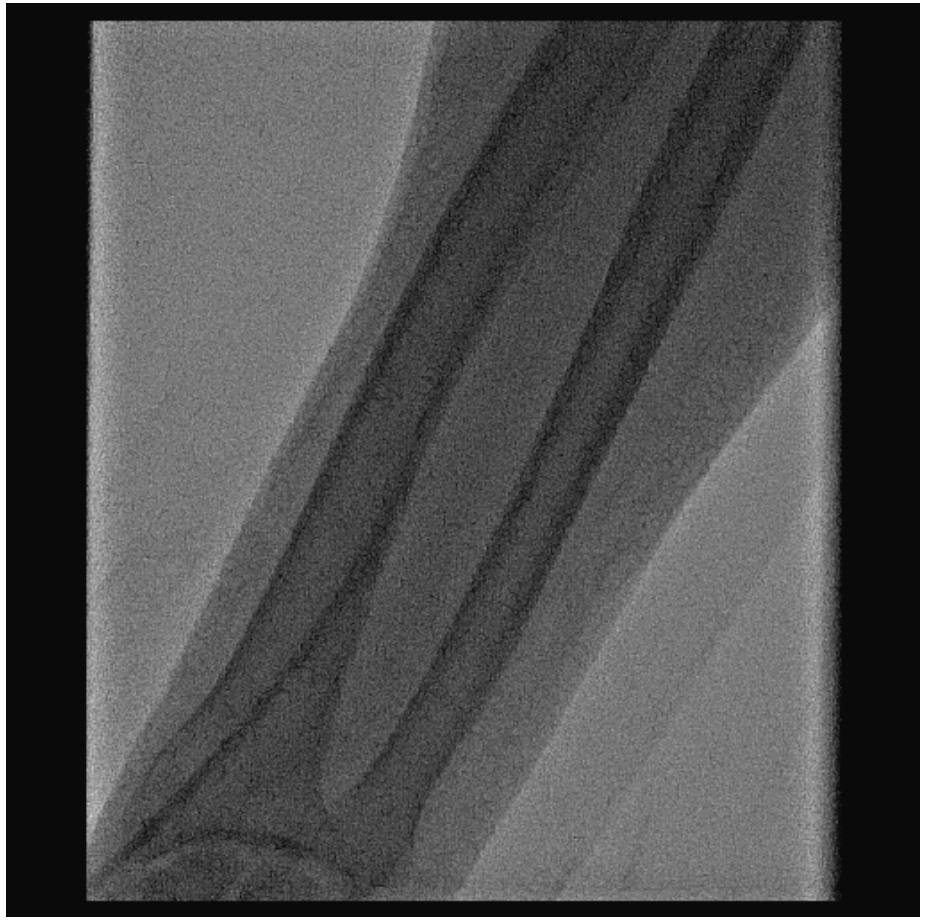


Radial to brachial

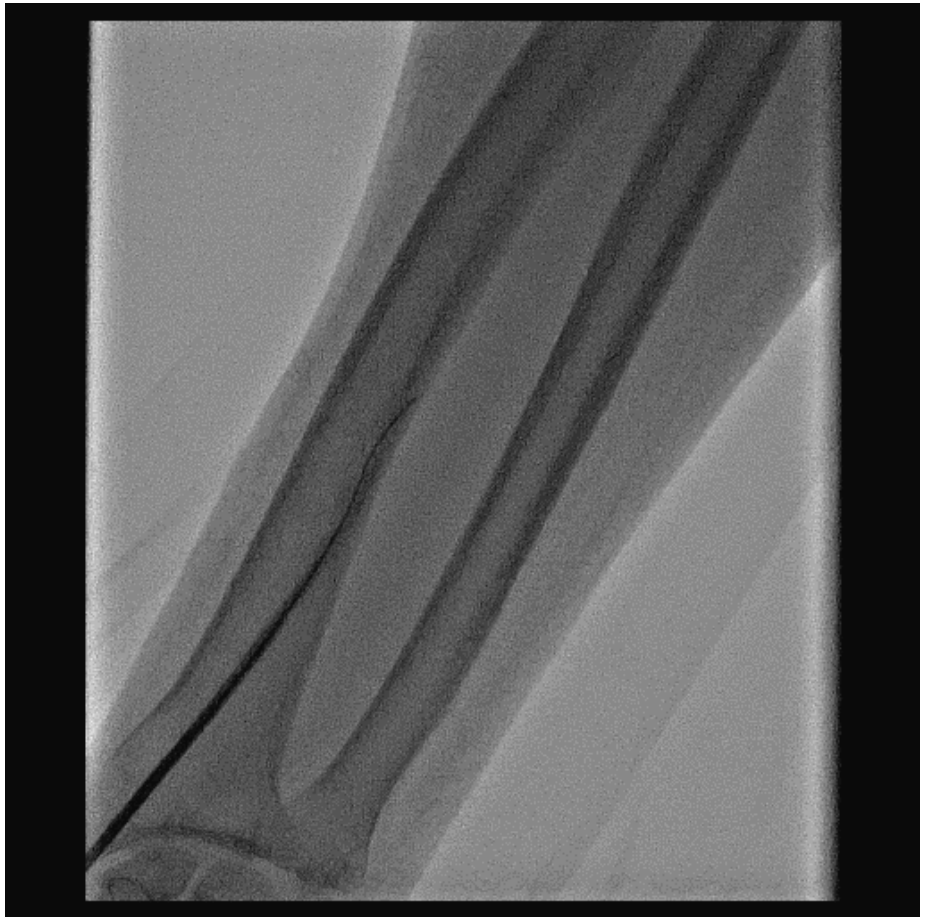
Radial to brachial

Radial to brachial





Radial to brachial



Radial to brachial

Radial to brachial

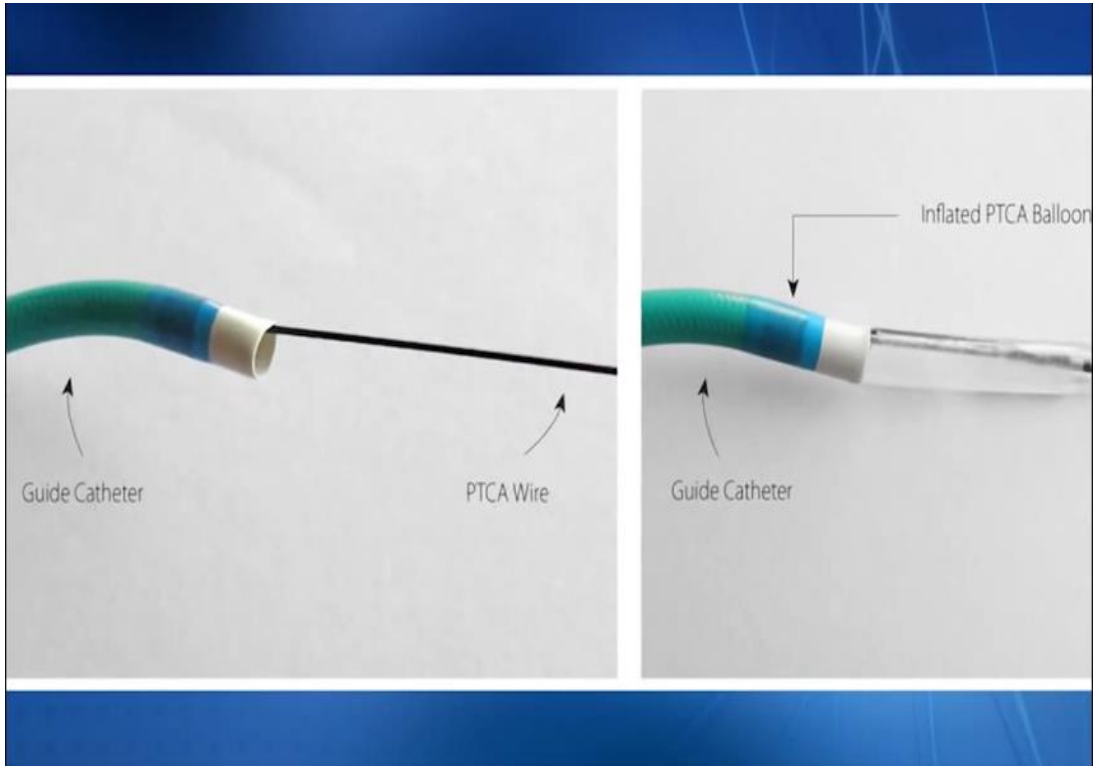
Radial to brachial

Radial to brachial

Radial to brachial

Radial to brachial

Balloon Assisted Tracking



Balloon Assisted Tracking

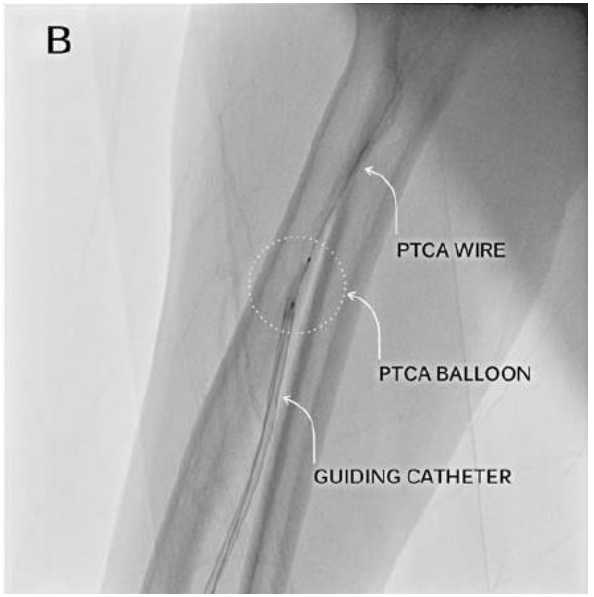
Catheterization and Cardiovascular Interventions 83:211–220 (2014)

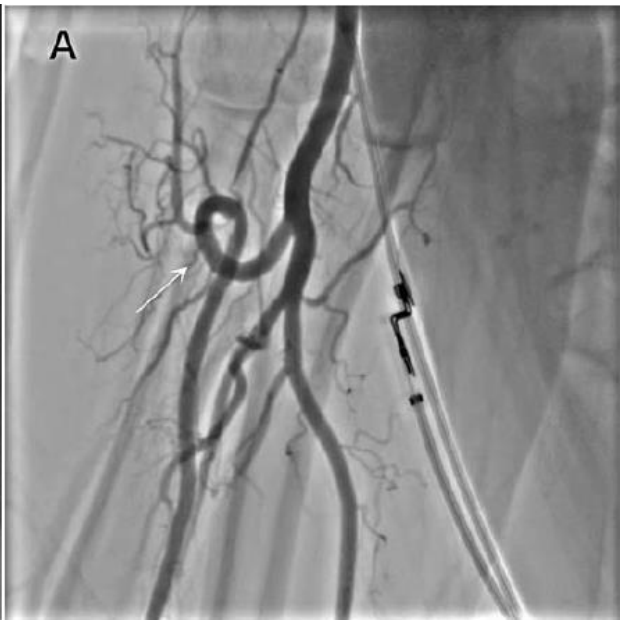
Balloon-Assisted Tracking: A Must-Know Technique to Overcome Difficult Anatomy During Transradial Approach

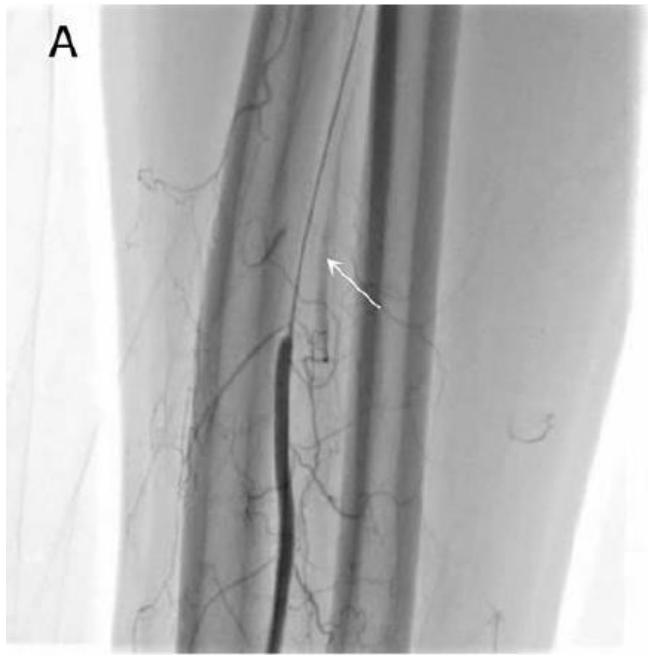
Tejas Patel,[1,2*] **MD, FACC, FSCAI, Sanjay Shah,**[1,2] **MD,**
Samir Pancholy,[3] **MD, FACC, FSCAI, Sunil Rao,**[4] **MD, FACC, FSCAI,**
Olivier F. Bertrand,[5] **MD, PhD, FSCAI, and Tak Kwan,**[6] **MD, FACC, FSCAI**

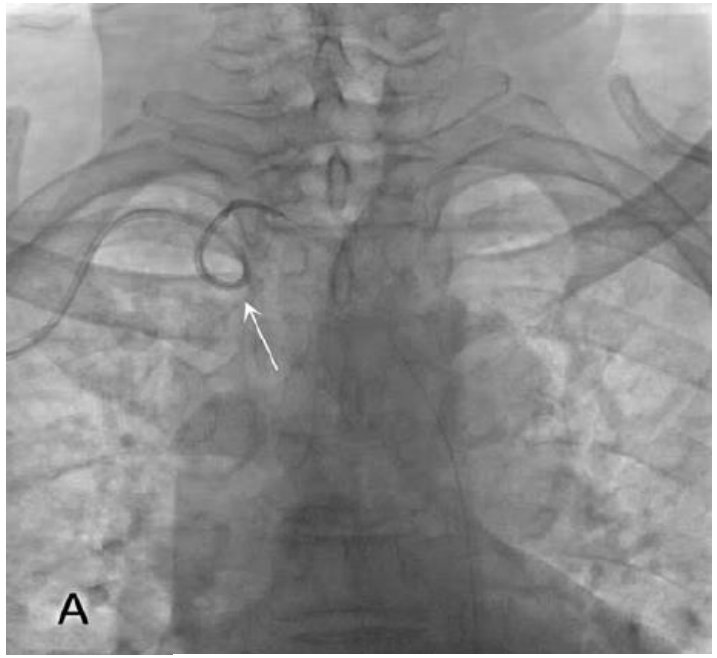
TABLE II. Break-Up of Difficult Vascular Anatomy During TRA

(1)	Small radial artery (RA diameter less than 1.5 mm)	25
(2)	Significant RA tortuosity	22
(3)	Complex RA loops	4
(4)	Severe and resistant RA spasm	6
(5)	Subclavian tortuosity and/or stenosis	6
	Total	**63**









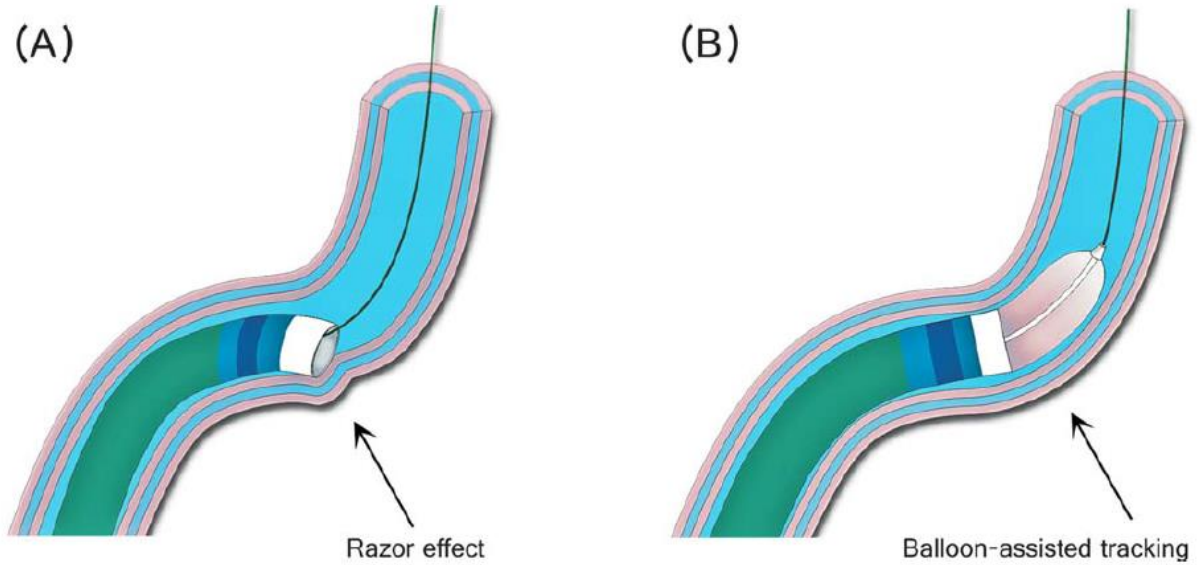
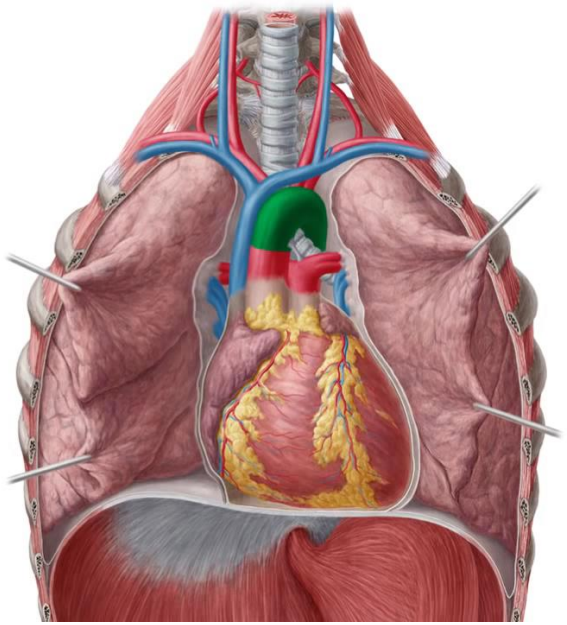
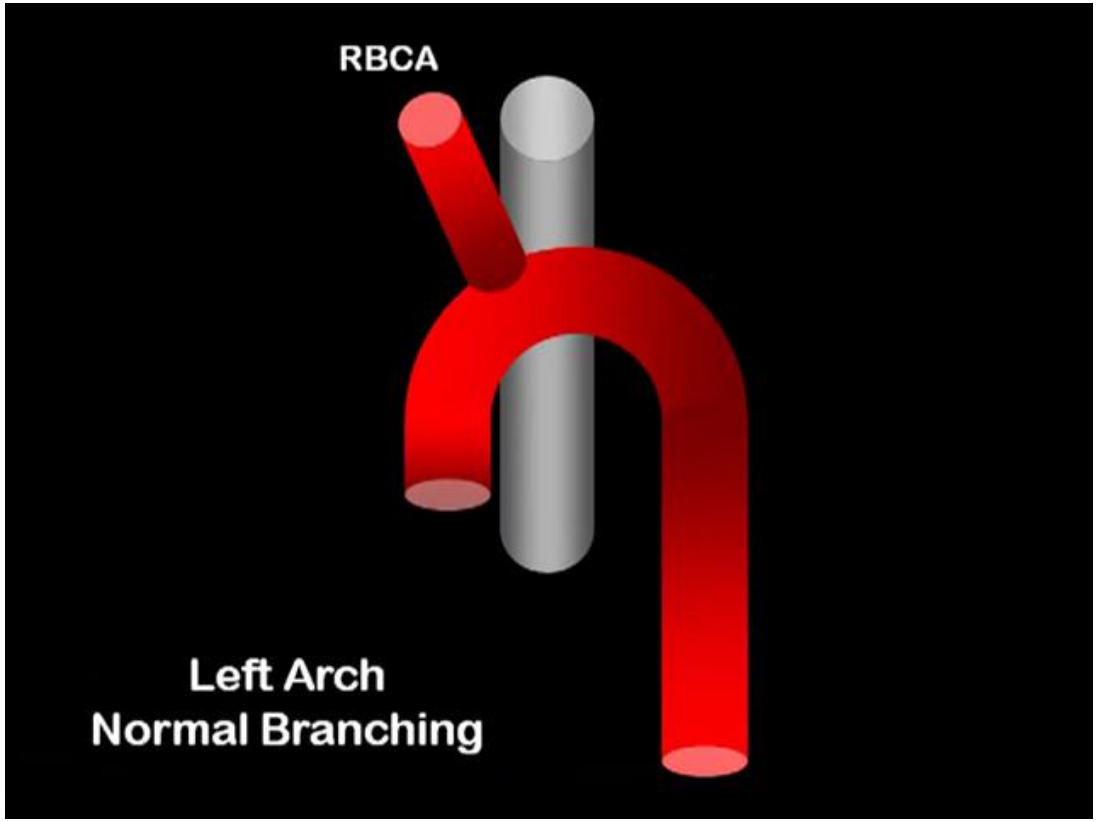


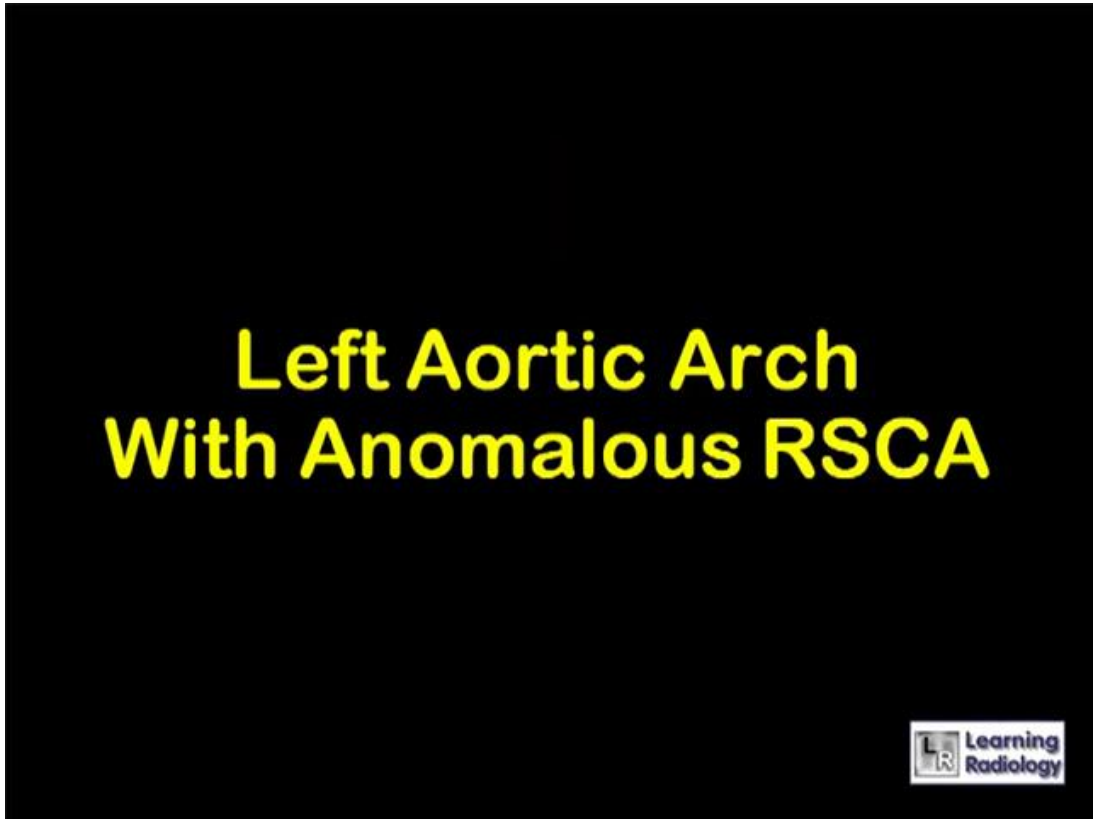
Fig. 7. Schematic representation of "razor effect" and balloon-assisted tracking. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

Subclavian, innominate and aortic arch

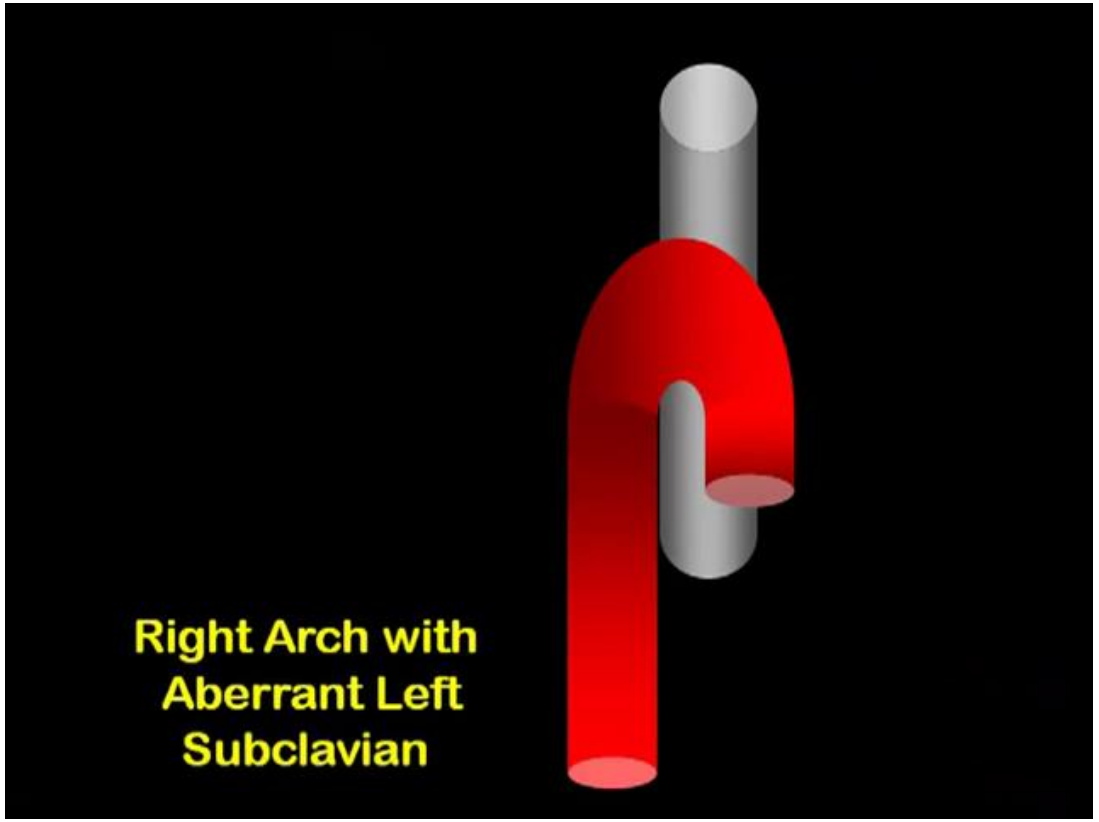




Subclavian, innominate and aortic arch



Subclavian, innominate and aortic arch



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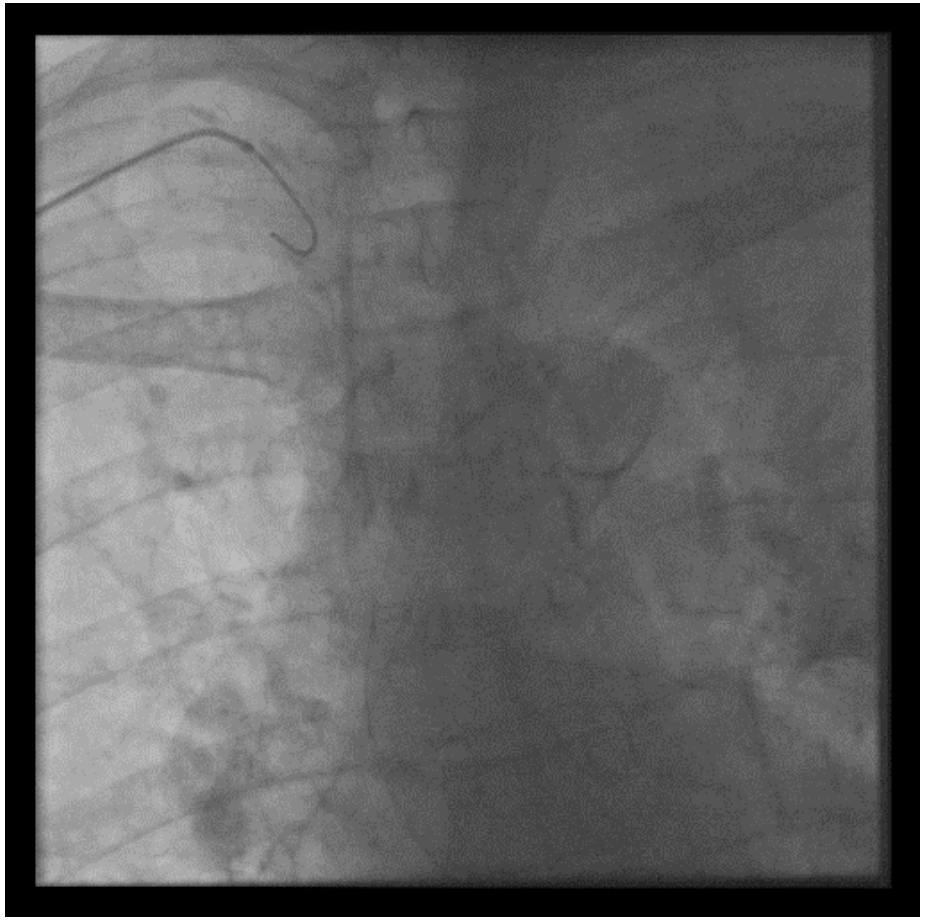

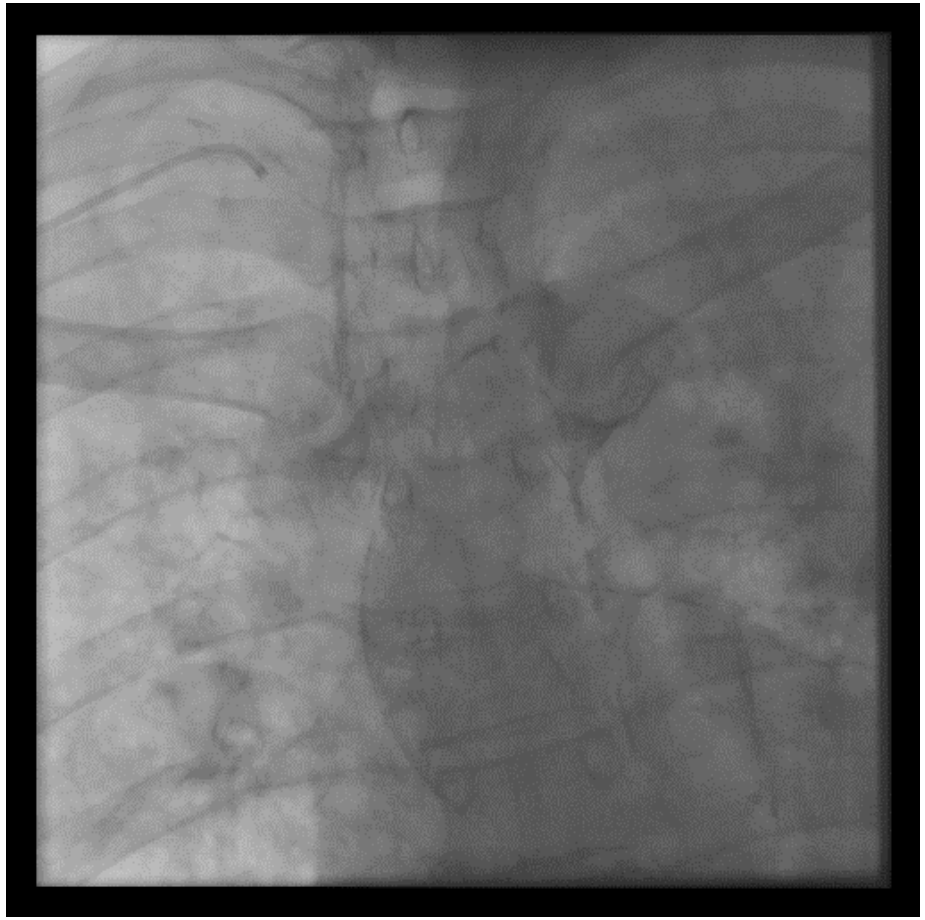

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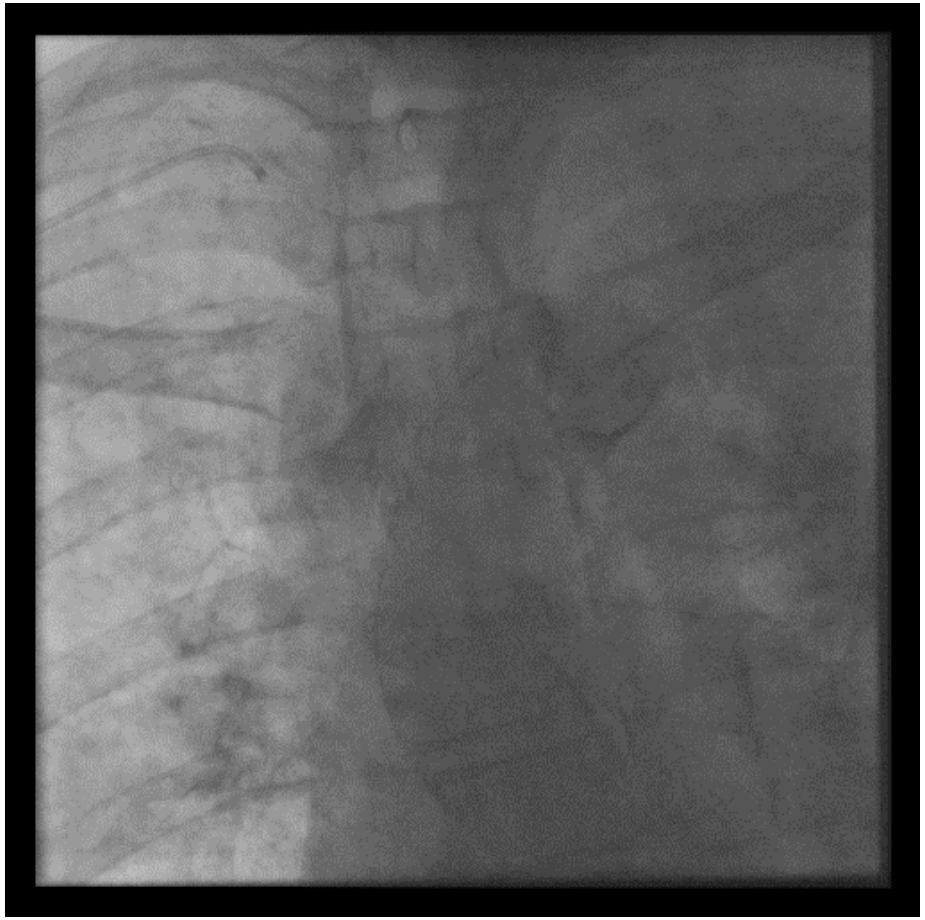
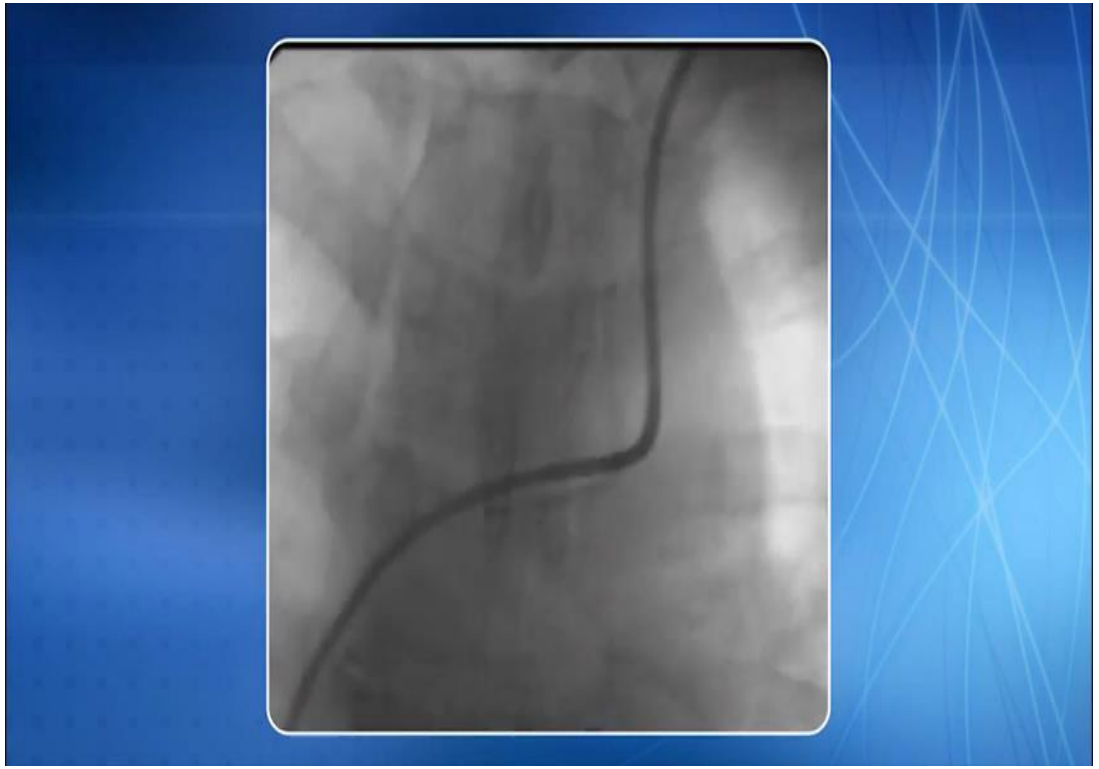


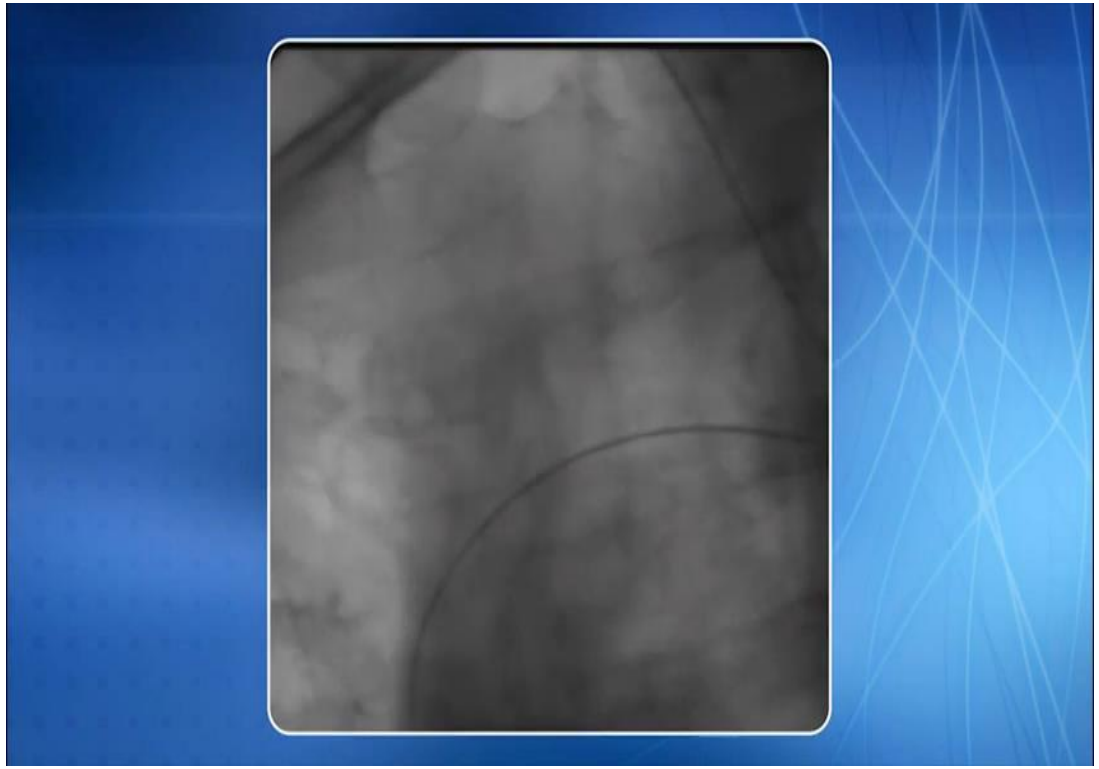
Subclavian, innominate and aortic arch

- Age
- Anatomical variations

Subclavian, innominate and aortic arch

Subclavian, innominate and aortic arch





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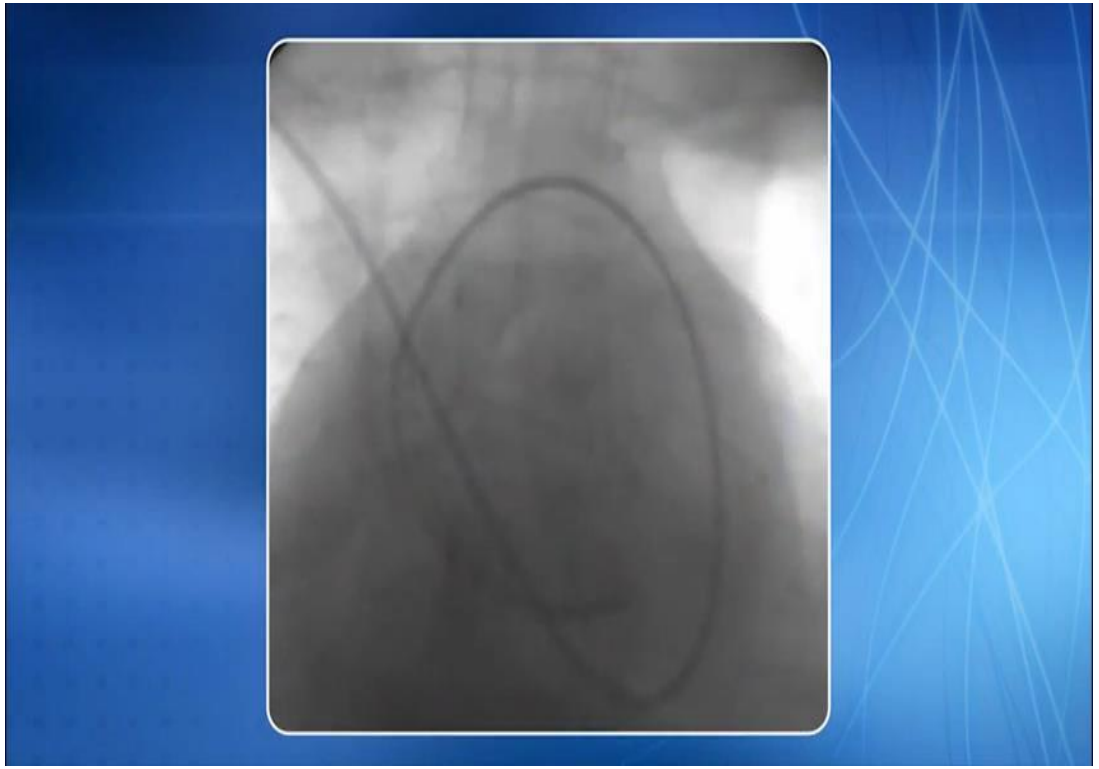
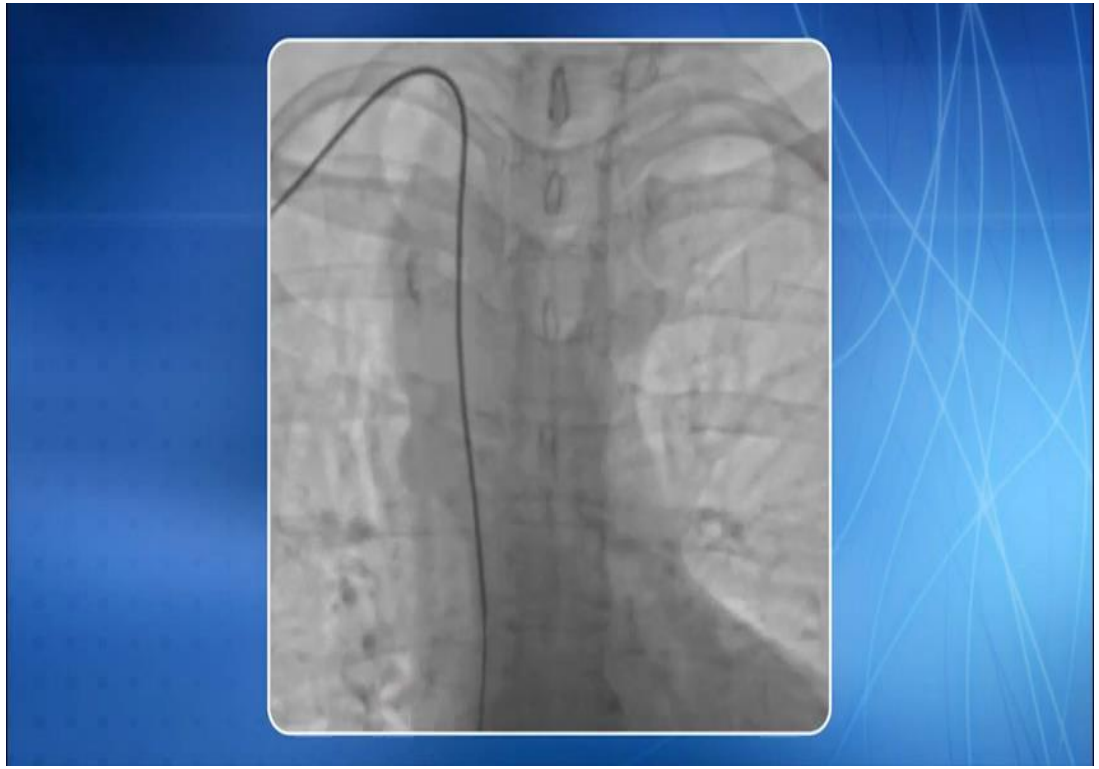
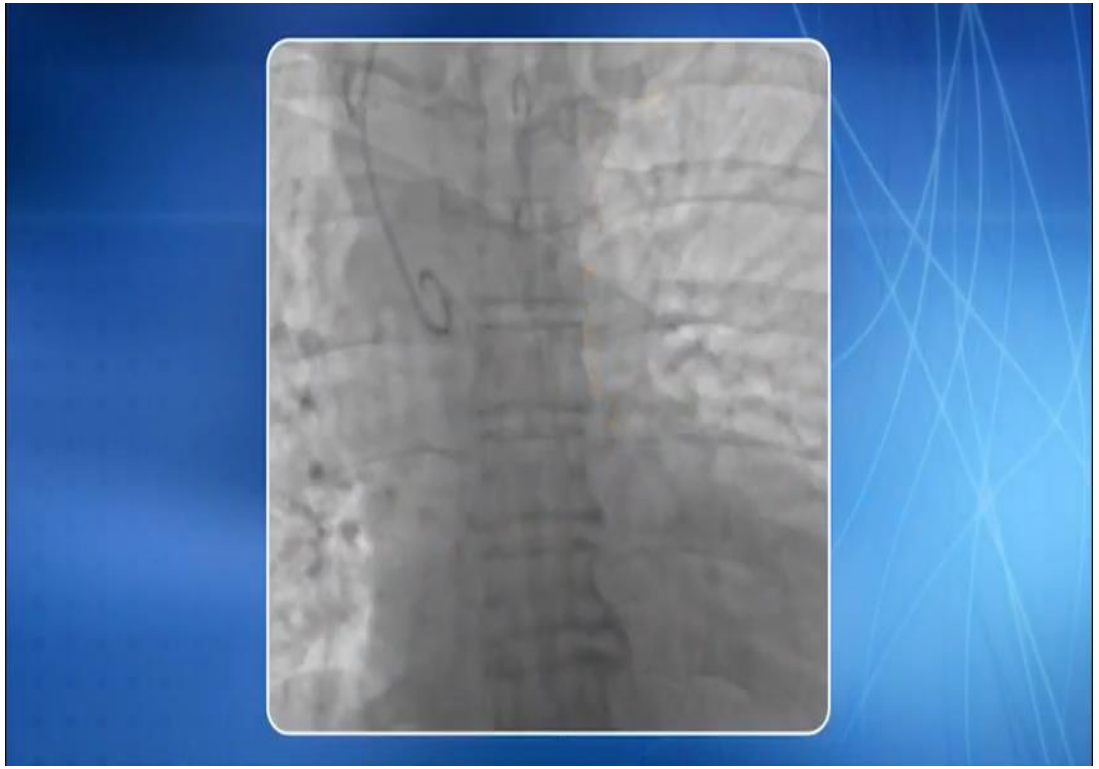


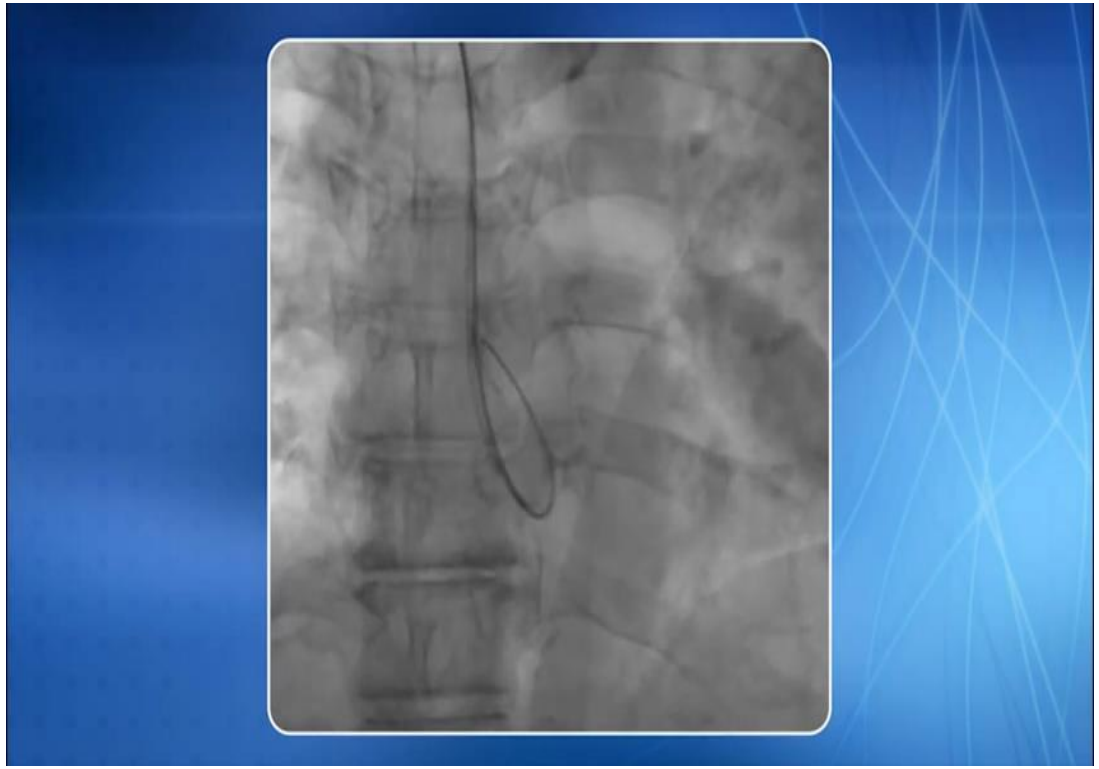


Subclavian, innominate and aortic arch



- Loops
- Anatomical variations
- Congenital anomalies

Cannulation of coronary ostia



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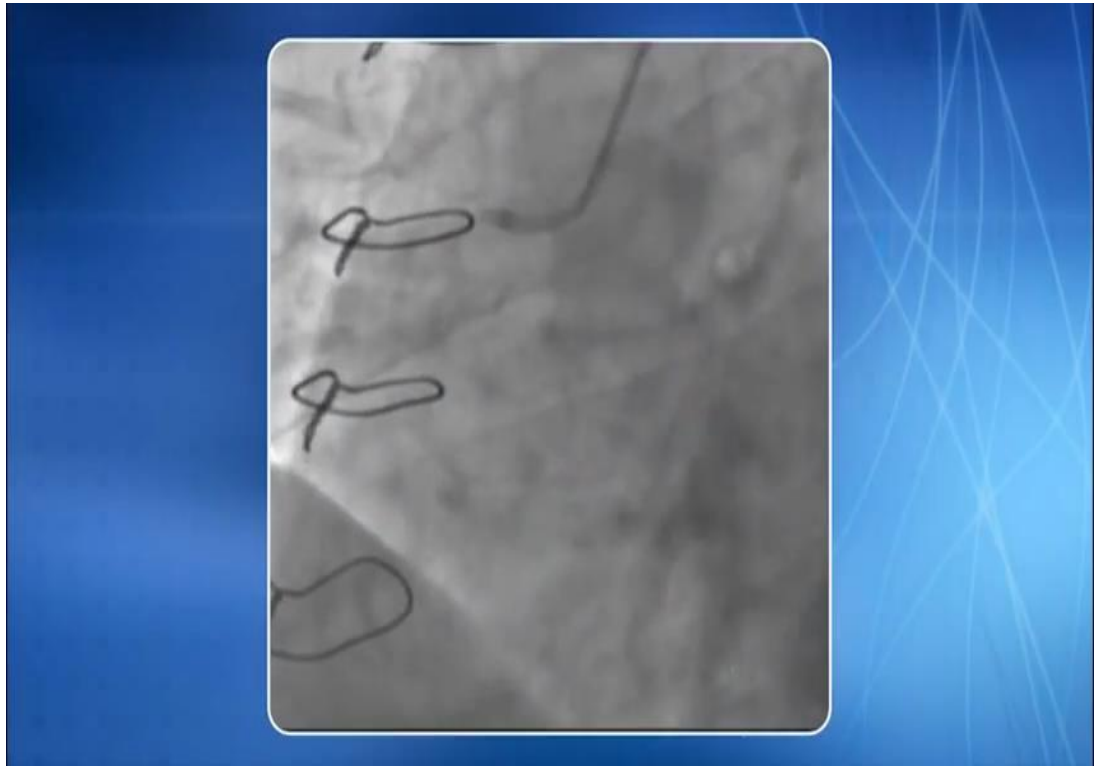

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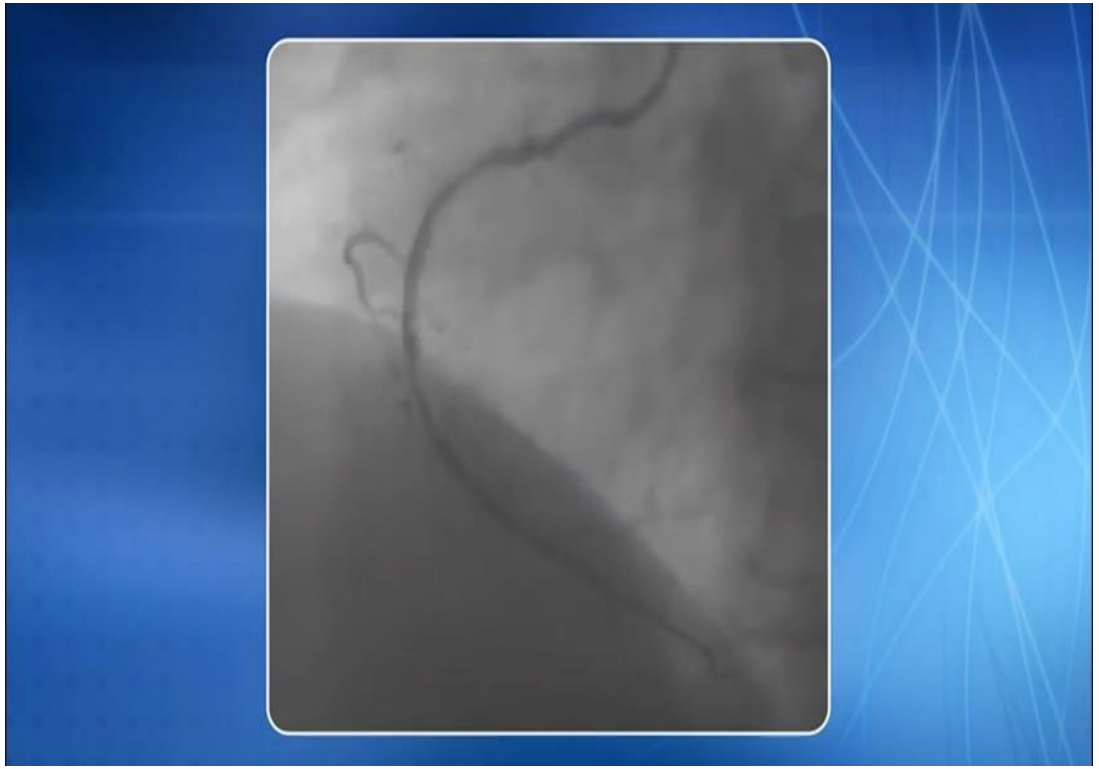
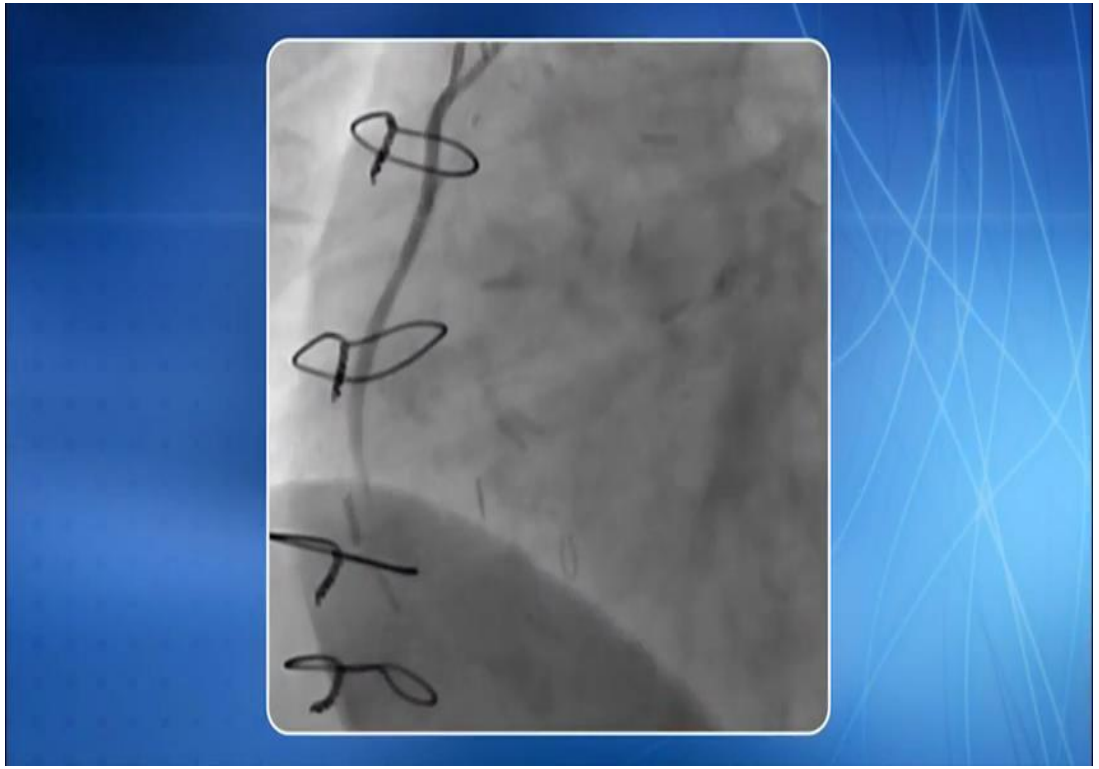
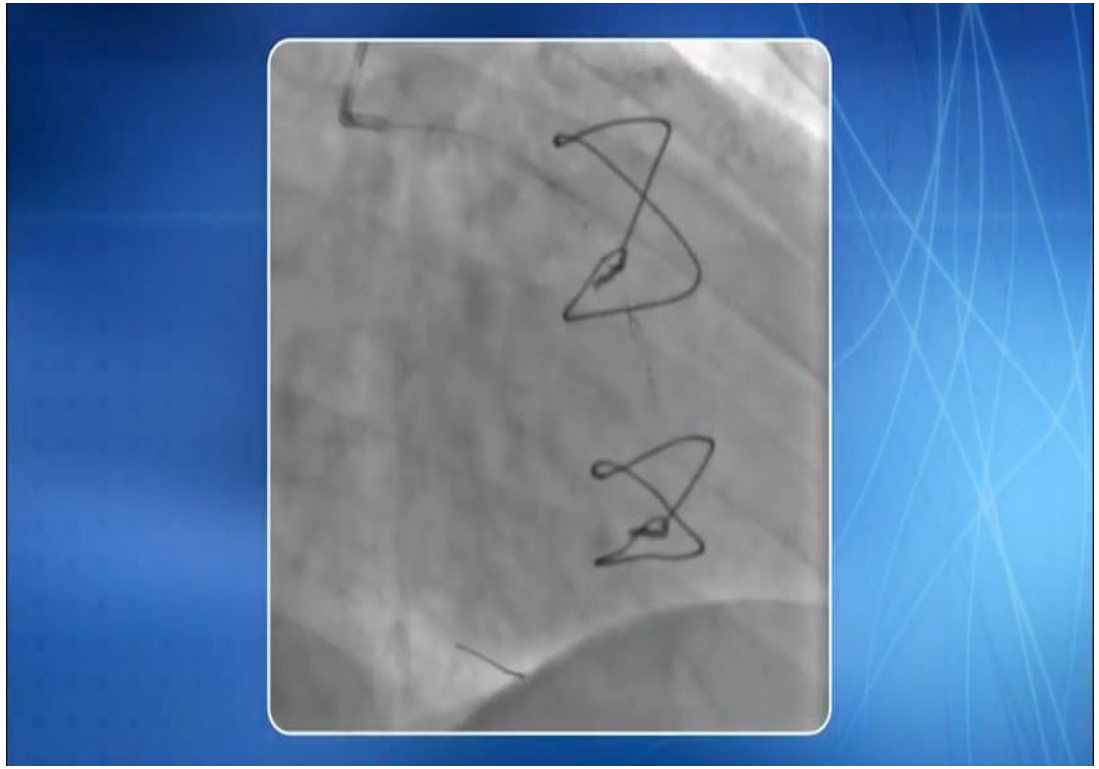


Bypass grafts



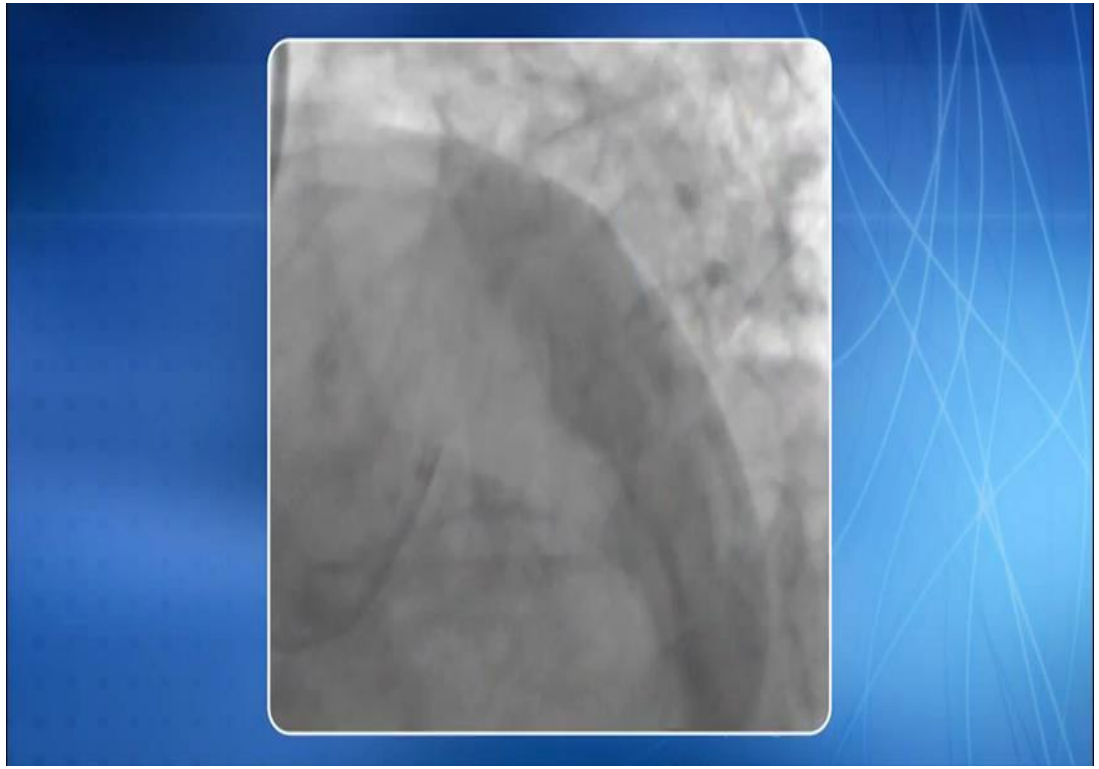


Bypass grafts

- Know your catheters
- Tips and tricks

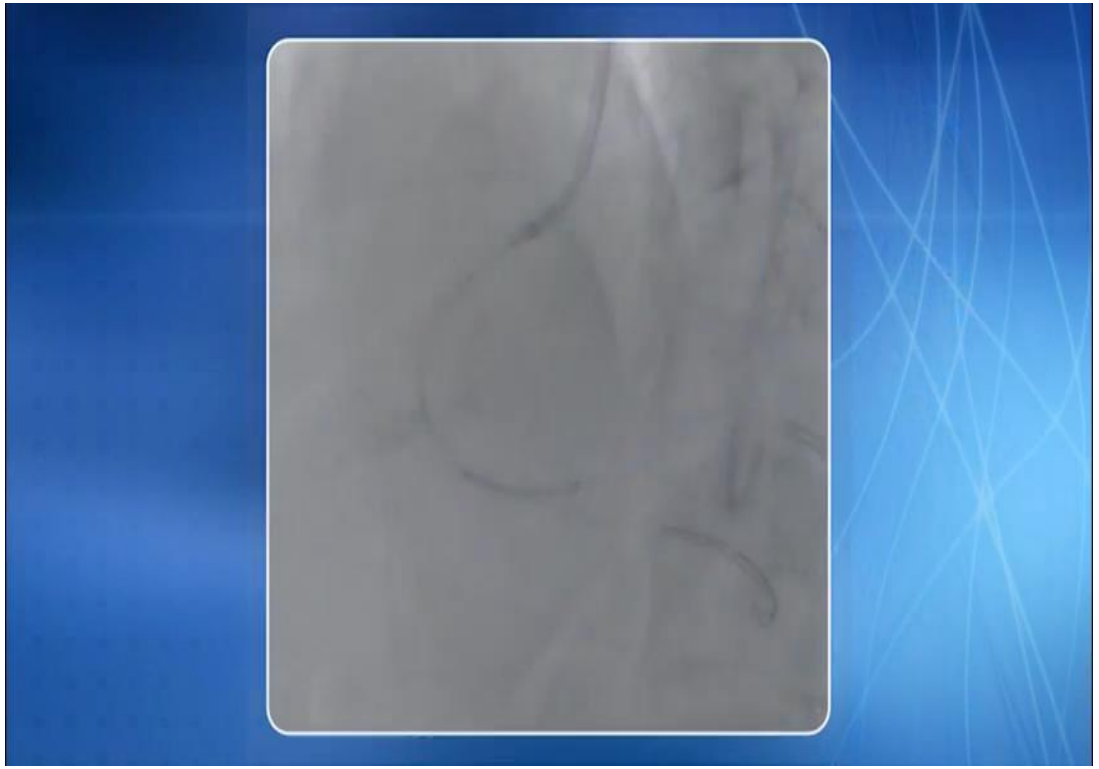
Bifurcations

- Do you need more than 6F
- Do you have sheathless guides



Bifurcations

Bifurcations



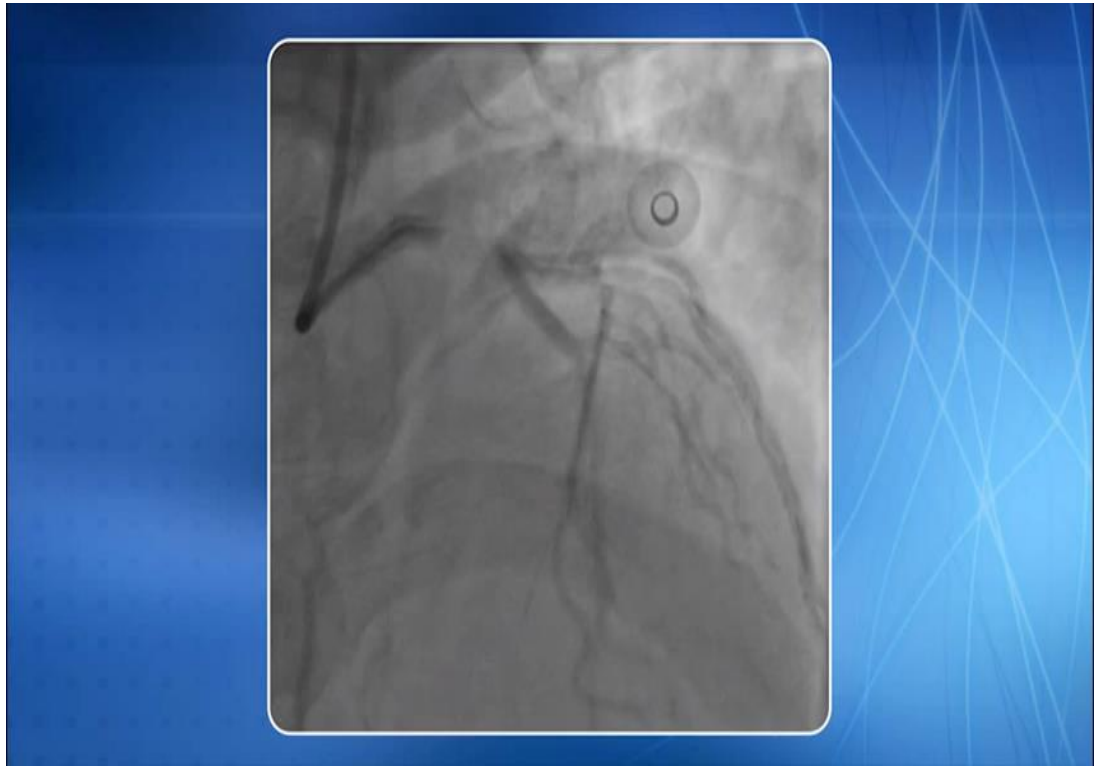
Left main

- 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

Crossover

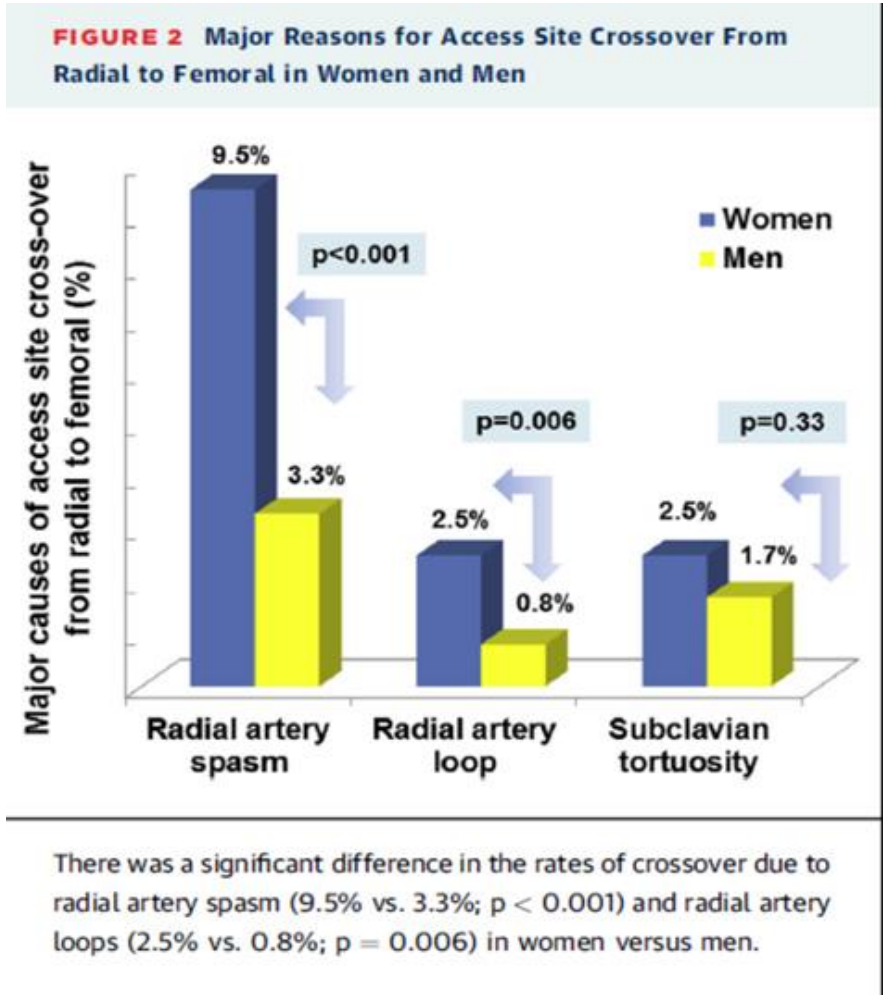
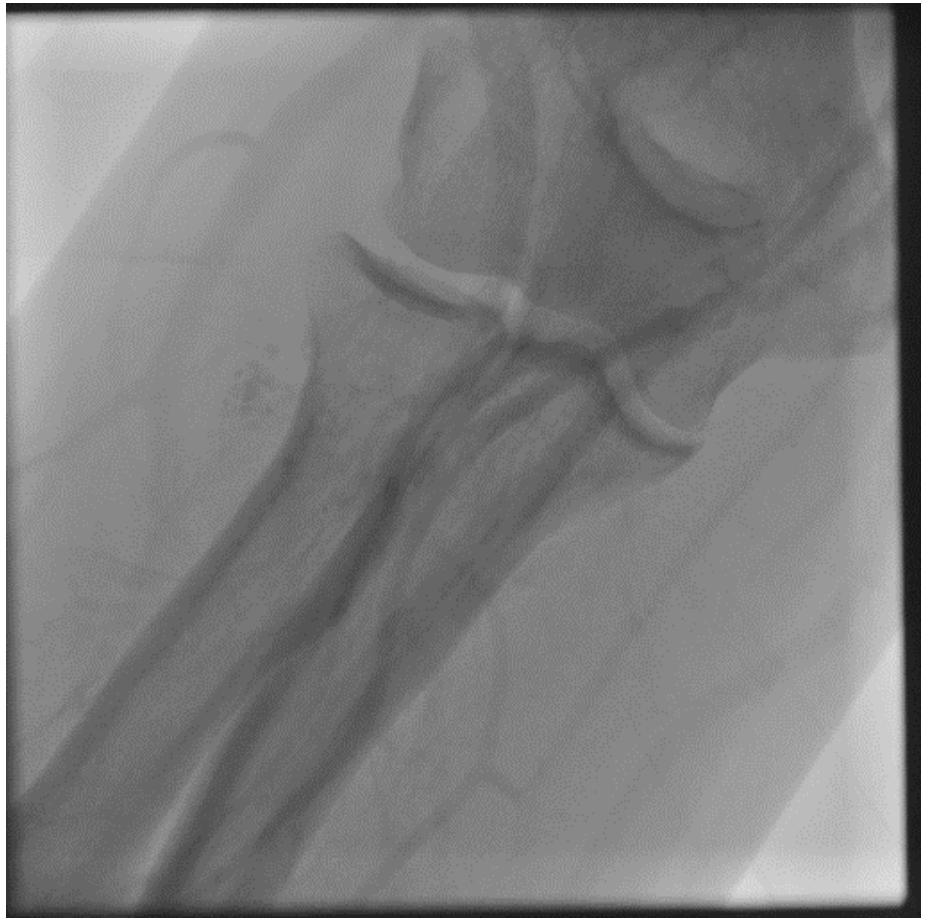
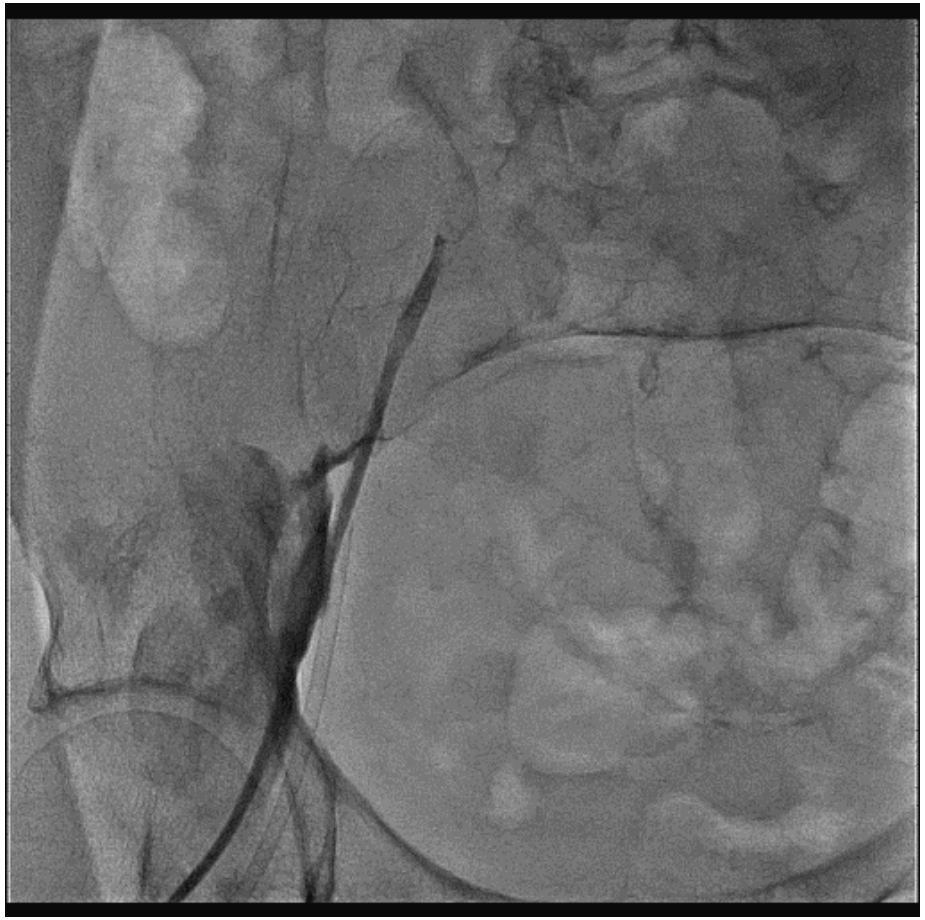


FIGURE 2 Major Reasons for Access Site Crossover From Radial to Femoral in Women and Men
Major causes of access site cross-over from radial to femoral (%)
9.5%
3.3%
2.5%
0.8%
2.5%
1.7%
p<0.001
p=0.006
p=0.33
Women
Men
Radial artery spasm
Radial artery loop
Subclavian tortuosity
There was a significant 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