

DISTAL RADIAL ACCESS AND POSTPROCEDURAL US EVALUATION OF PROXIMAL AND DISTAL RADIAL ARTERY

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ARTERIAL ACCESS FOR PCI



Recommendations on choice of stent and access site

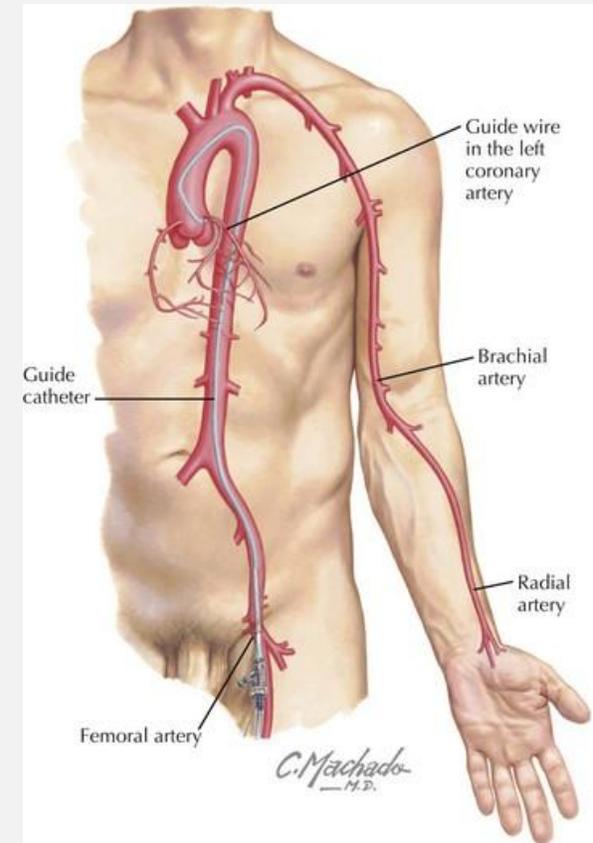
| Recommendations | Class ^a | Level ^b |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|
| DES are recommended over BMS for any PCI irrespective of: <ul style="list-style-type: none"> ● clinical presentation ● lesion type ● planned non-cardiac surgery ● anticipated duration of DAPT ● concomitant anticoagulant therapy.^{100,578,579,640} | I | A |
| Radial access is recommended as the standard approach, unless there are overriding procedural considerations. ^{172,638,641} | I | A |
| BRS are currently not recommended for clinical use outside of clinical studies. ⁶⁴²⁻⁶⁵⁰ | III | C |

© ESC 2018

BMS = bare-metal stents; BRS = bioresorbable scaffolds; DAPT = dual antiplatelet therapy; DES = drug-eluting stents; PCI = percutaneous coronary intervention.

^aClass of recommendation.

^bLevel of evidence.



ARTERIAL ACCESS FOR PCI



European Society
of Cardiology

European Heart Journal (2019) 40, 87–165
doi:10.1093/eurheartj/ehy394

ESC/EACTS GUIDELINES

2018 ESC/EACTS Guidelines on myocardial revascularization

The Task Force on myocardial revascularization of the European Society of Cardiology (ESC) and European Association for Cardio-Thoracic Surgery (EACTS)

Developed with the special contribution of the European Association for Percutaneous Cardiovascular Interventions (EAPCI)

Recommendations on choice of stent and access site

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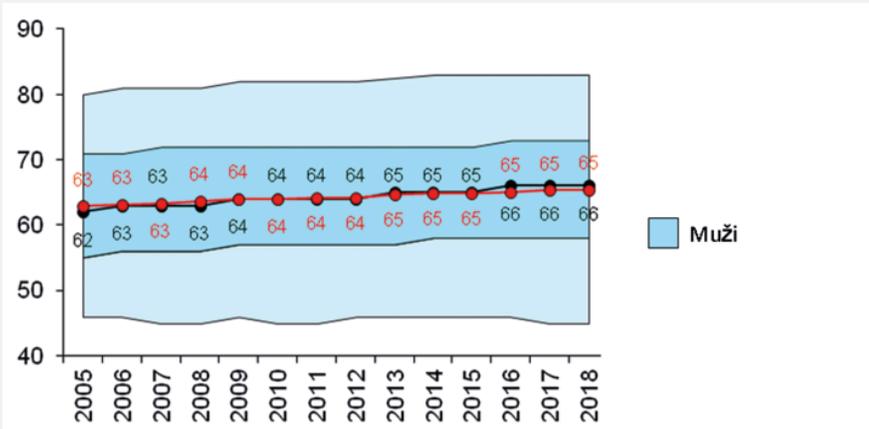
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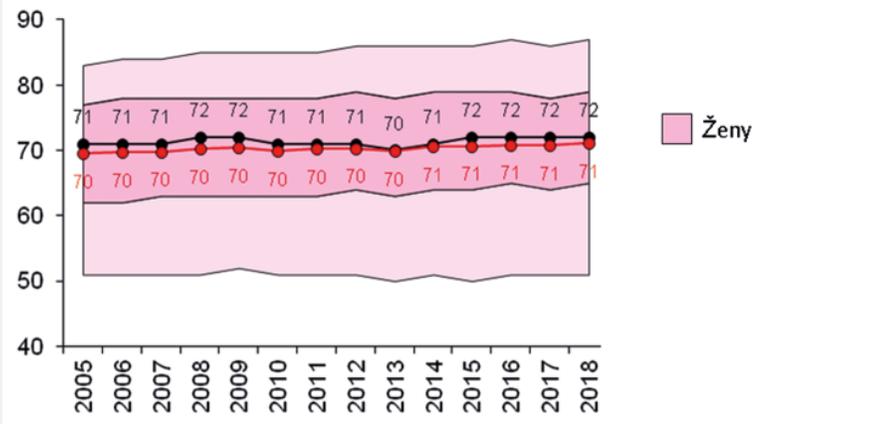
^bLevel of evidence.

PCI in the Czech Republic - data from the National Register of Cardiovascular Interventions

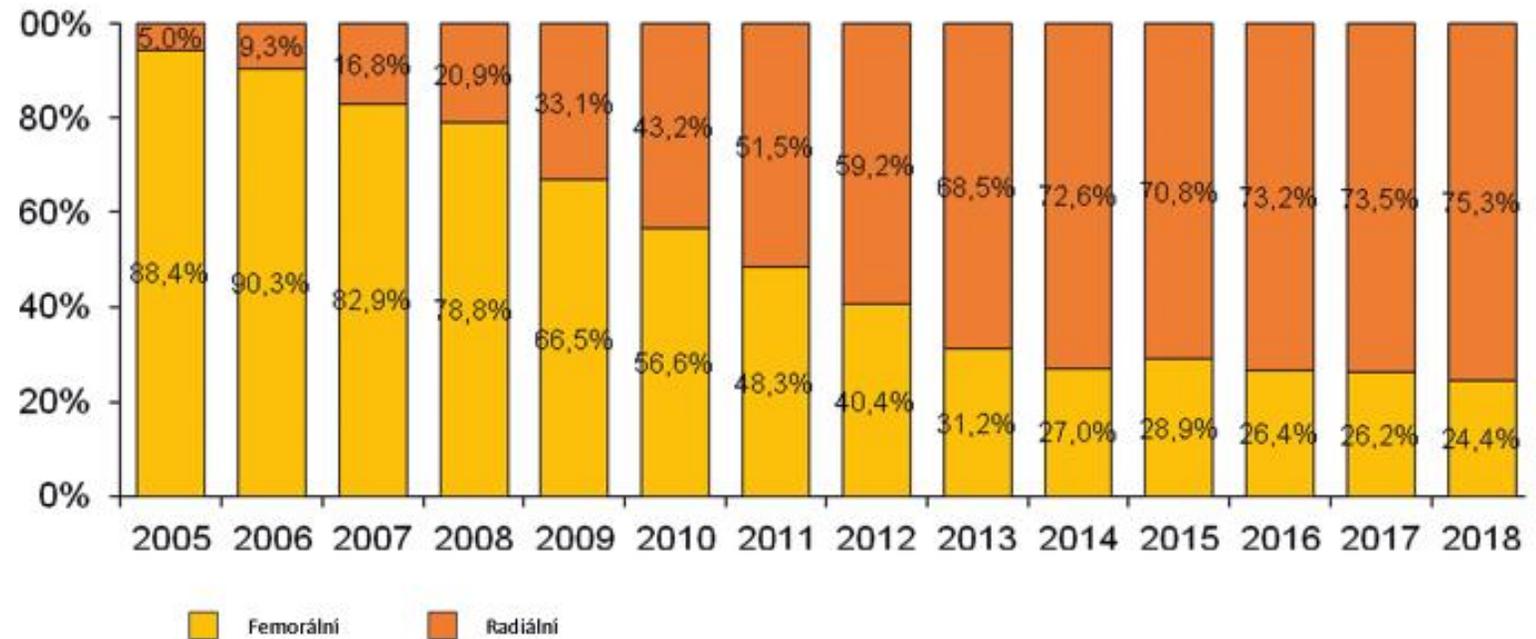
PCI and age of men :



and women :

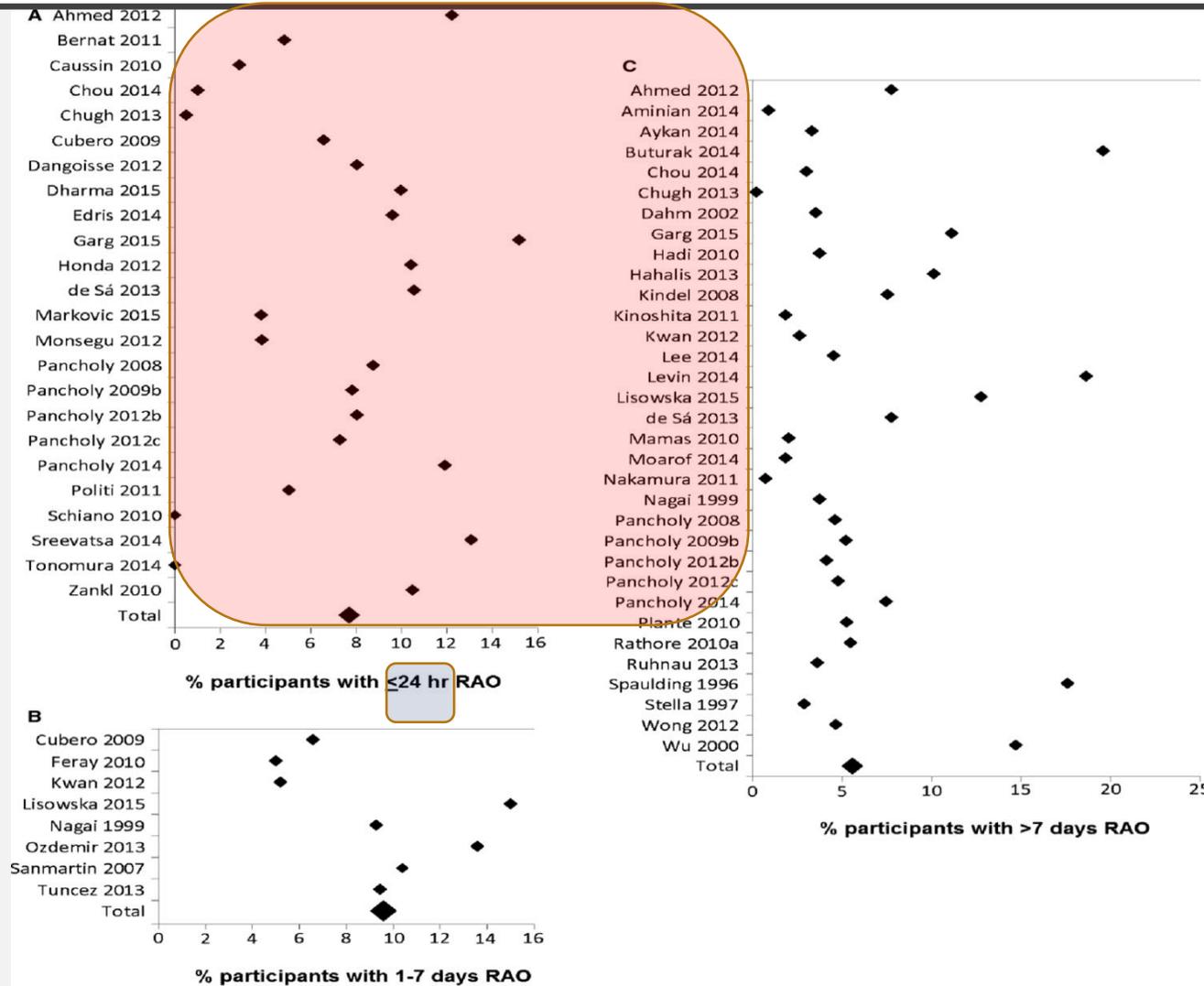


Transradial



versus **transfemoral** approach for PCI

SYSTEMATIC-REVIEW - 66 TRIALS, EARLY RAO (UP TO 24HRS) IN 24 OF THEM

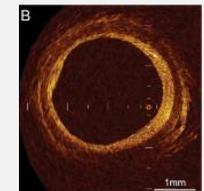
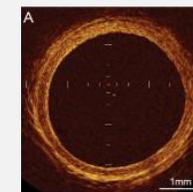
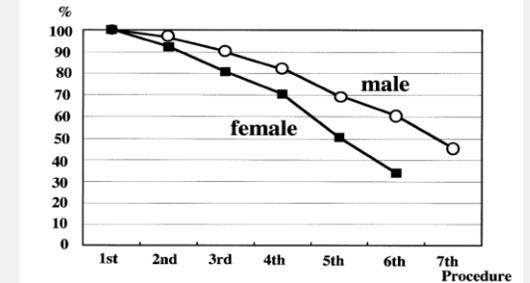
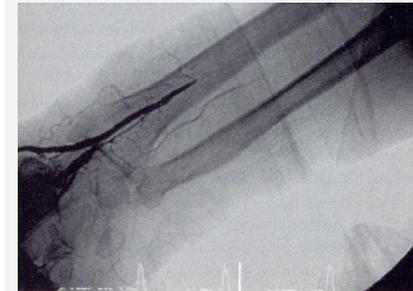


| Group | No. of studies | RAO events | Total | Mean | SD | 95%CI |
|-----------------|----------------|------------|-------|------|------|-------|
| RAO at 1 day | 24 | 841 | 10938 | 7.69 | 4.23 | 0.08 |
| RAO at 2-6 days | 8 | 132 | 1377 | 9.59 | 3.69 | 0.19 |
| RAO at 7+ days | 33 | 602 | 10821 | 5.56 | 5.19 | 0.1 |

Early RAO ≤24h 7,7%

24 studií s téměř 11 000 pacienty

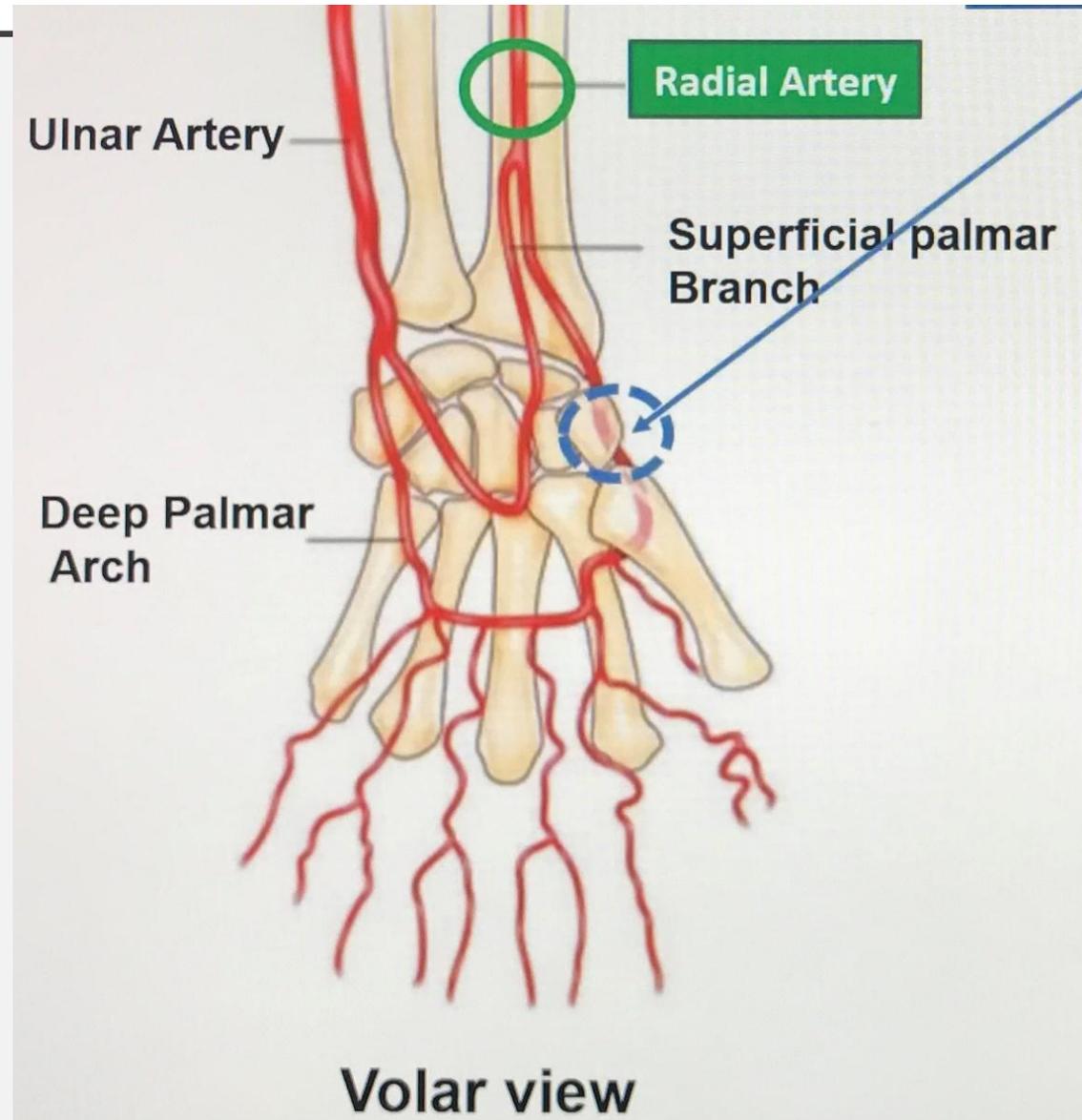
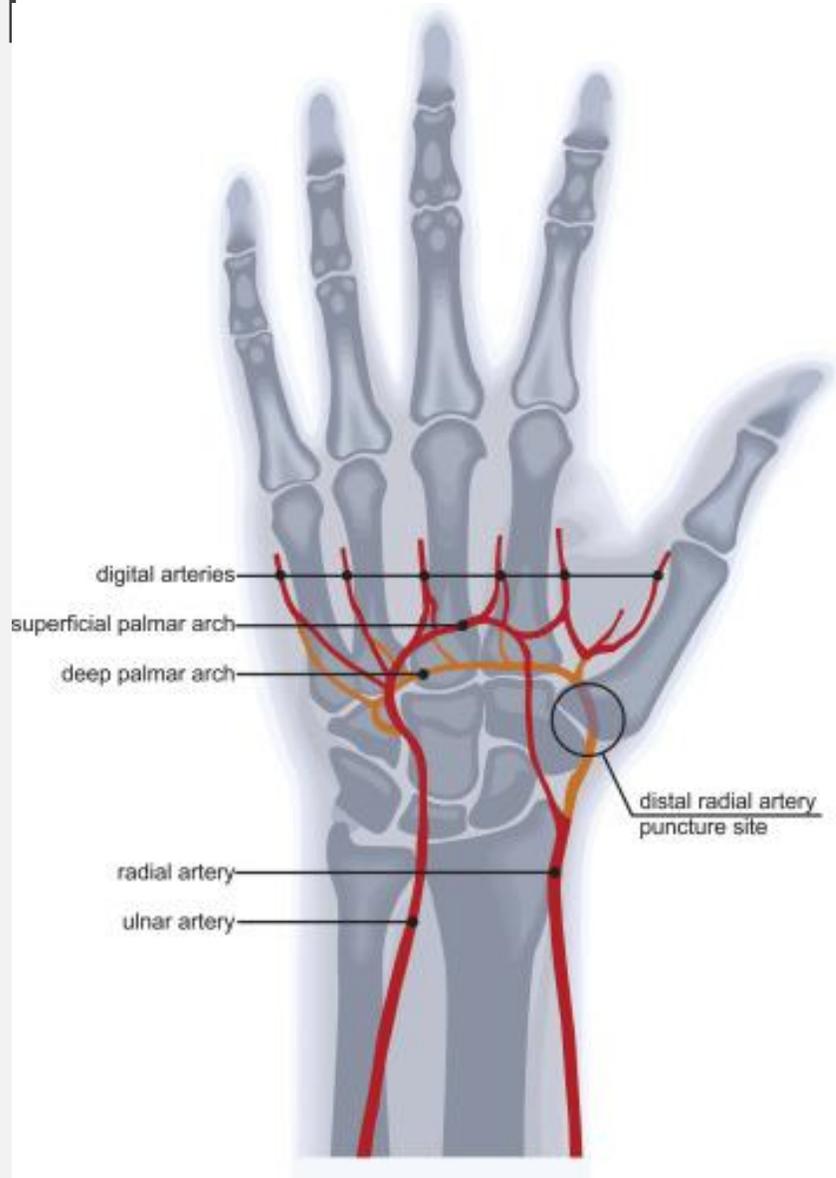
pouze RCT (n=12) s > 5000 pacienty 7,7%



PROXIMAL RADIAL ACCESS COMPLICATIONS

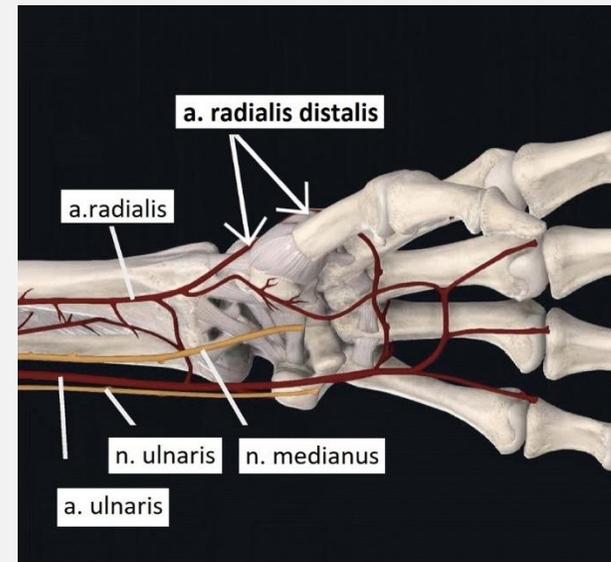
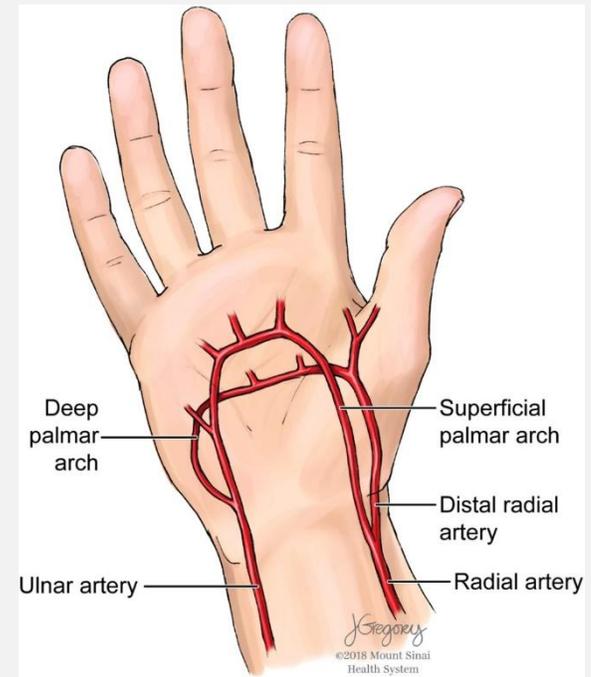
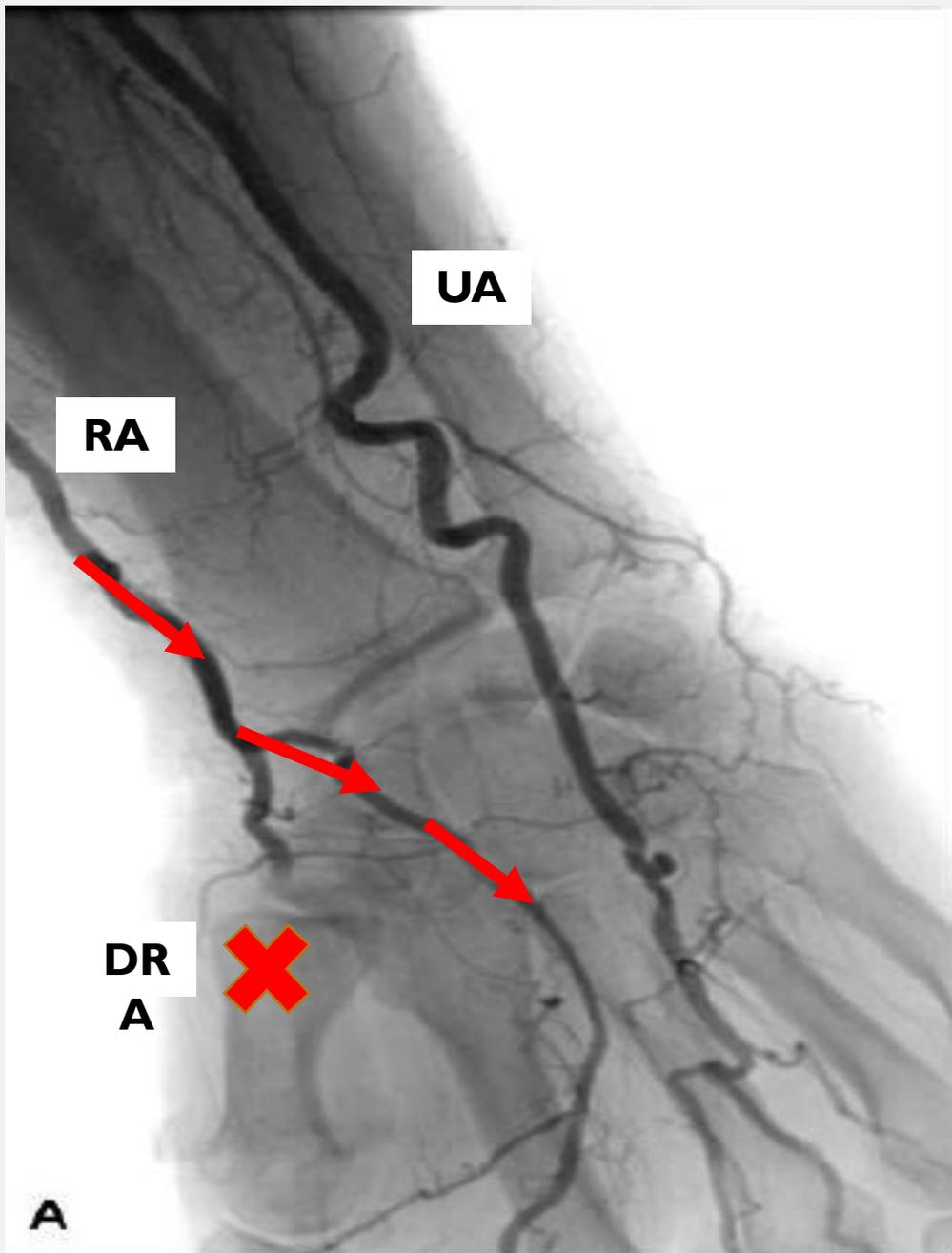
| Complication | Rate of occurrence |
|-----------------------------------|--------------------|
| RAO | 3,9-8,1% |
| Spasm | 4,3-16% |
| Hematoma | 1,2-2,6% |
| Pseudoaneurysm | 0,03-0,2% |
| Perforation of Radial/Brachial a. | 0,07-0,9% |
| AV fistula | <0,1% |
| Dissection of Access Artery | 0,05-0,4% |
| Hand Ischemia | <0,1% |
| Compartment syndrome | <0,05% |

WHY DISTAL RADIAL ACCESS ?



WHY DISTAL RADIAL APPROACH?

- Minimises the risk of proximal closure
- Minimises the risk of damage to the radial artery before branching
- Arterial compression is easier, shorter and gentler
- Allows a combination of two distal with one proximal approach, giving the option of four additional arterial access routes
- Radial artery can be used for AV fistula or as a quality arterial graft for CABG after the procedure
- Minimizes risk of compartment syndrome and damage to wrist structures
- Minimizes the risk of damage to surrounding wrist tissues
- Allows for recanalization of the proximal RAO closure
- Allows better anatomical proportions for left-sided radial access
- Minimises workload of staff/nurses by using simplified haemostatic protocol

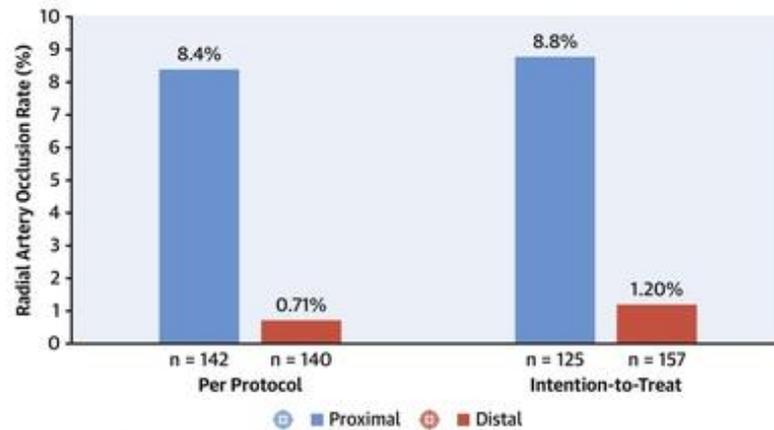


Sgueglia GA et al. *JACC CI* 2018

DISTAL RADIAL APPROACH AND REDUCTION OF PROXIMAL RAO - RECENT RCT

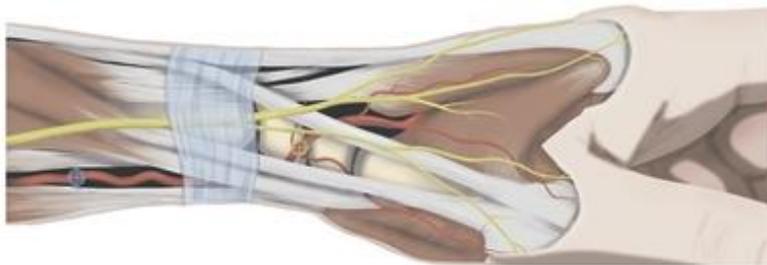
JACC CARDIOVASCULAR INTERVENTIONS 2021;14:4.

CENTRAL ILLUSTRATION: Proximal (Forearm) Radial Artery Occlusion Rates at 24 h Using the Proximal (Conventional) Versus Distal (Snuffbox) Radial Artery Approach



OR: 12.8, 95% CI: 1.6-100.0, p = 0.002

OR: 7.4, 95% CI: 1.6-34.3, p = 0.003



Eid-Lidt, G. et al. *J Am Coll Cardiol Interv.* 2021;14(4):378-85.

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JACC: CARDIOVASCULAR INTERVENTIONS
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EDITORIAL COMMENT

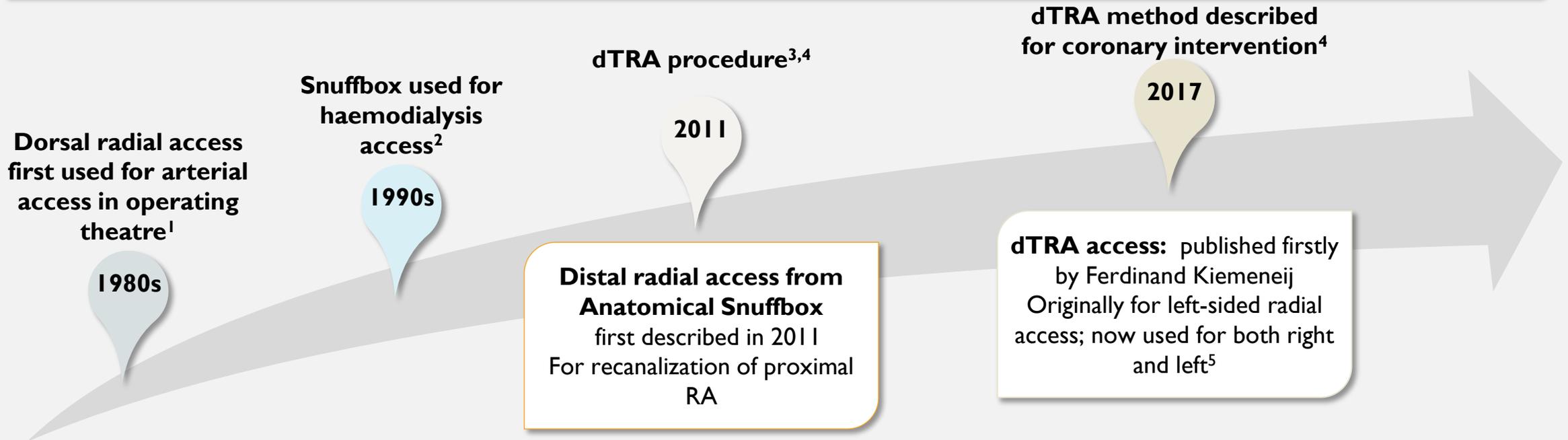
Distal Radial Approach

The Next Promising Step in an Even More Minimally Invasive Strategy*

Ivo Bernat, MD

DISTAL RADIAL ACCESS (DTRA)

dTRA is also used for non-coronary procedures and for dialysis ^{6,7}



1. Pyles S et al. Anesth Analg 1982;61:876–8; 2. Horimi H et al. ASAIO J 1996;42:177–80; 3. Babunashvili A, Dundua D. Catheter Cardiovasc Interv 2011;77:530–6; 4. Kiemeneij F. EuroIntervention 2017;13:851–7; 5. Peixoto Oliveira et al. Cardiovasc Diagn Ther 2019;9:513–9; 6. Brunet MC et al. Neurointerv Surg 2019;11:710–3; 7. Letachowicz K et al. J Vasc Surg 2016;63:436–40.

Ferdinand Kiemeneij

1993 – first publication about transradial PCI – IA in guidelines since 2015

2017 – first complex publication about distal radial approach

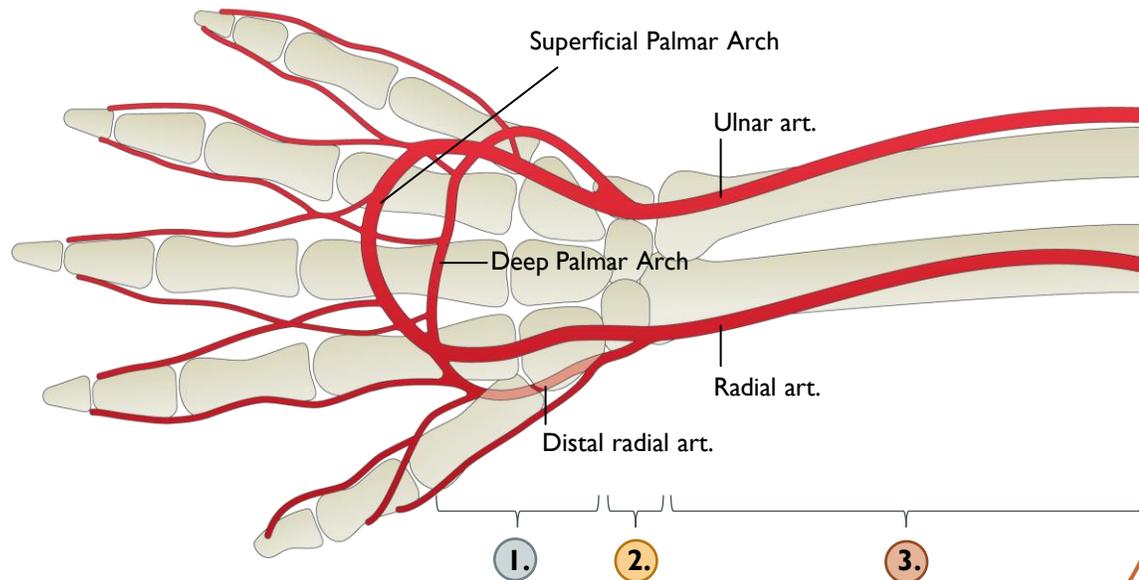


- **DRA and Cardiology department in Pilsen Faculty hospital**
 - Bernat I. Distální radiální přístup u koronárních katetrizací a intervencí. *Interv Akut Kardiol* 2020; 19(2): 88–90
 - Bernat I. Distal Radial Approach: The Next Promising Step in an Even More Minimally Invasive Strategy. *JACC Cardiovasc Interv.* 2021 Feb 22; 14(4):386-387
 - Aminian A. et al. Distal Versus Conventional Radial Access for Coronary Angiography and Intervention: The DISCO RADIAL Trial. *JACC Cardiovasc Interv.* 2022 Jun 27; 15(12):1191-1201

WHERE IS LOCATED PUNCTURE SITE FOR DTRA?

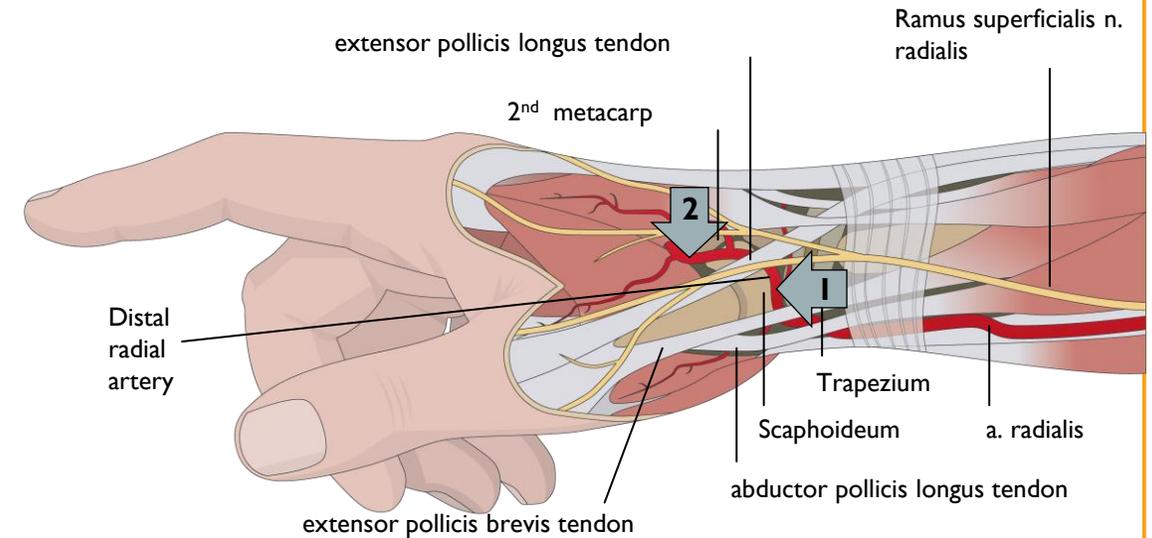
Radial artery can be divided to three segments:¹

- 1. Distal:** From wrist to dorsum of the hand
- 2. Mid:** In the wrist
- 3. Proximal:** In the forearm



Two sites available for distal radial artery:²

- 1. In the “snuffbox”**
- 2. Distal to snuffbox**

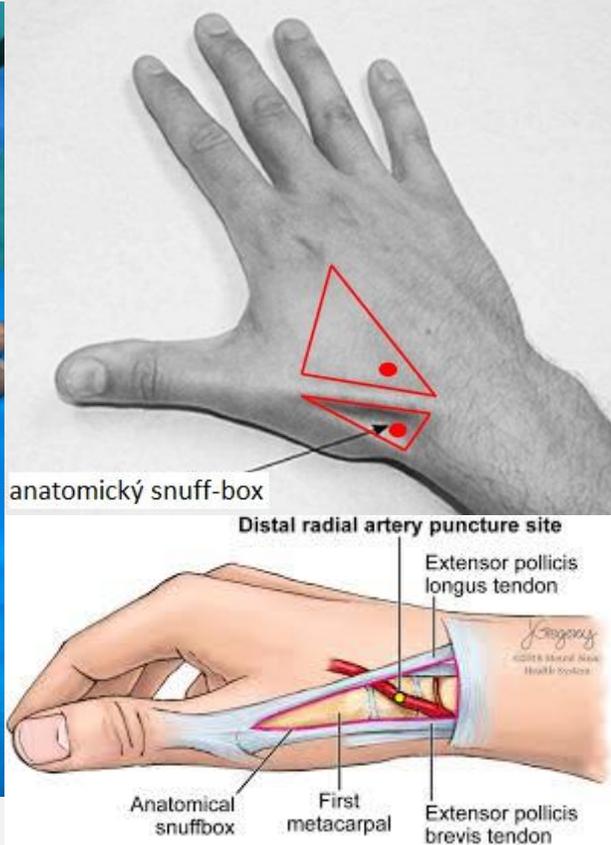


“Snuffbox” – Fossa tabatiere – foveola radialis³

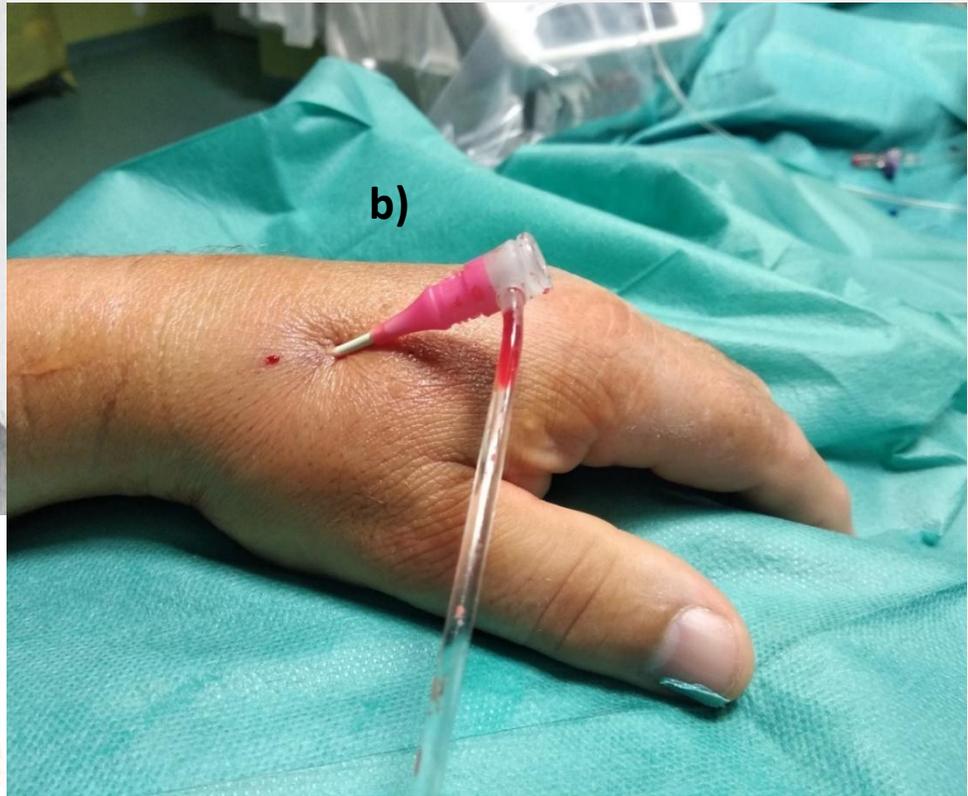
dTRA, distal transradial access.

1. Scalise RFM et al. J Clin Med 2019;8:1727; 2. Sgueglia GA et al. JACC Cardiovasc Interv 2018;11:2113–19; 3. Kiemeneij F. EuroIntervention 2017;13:851–7.

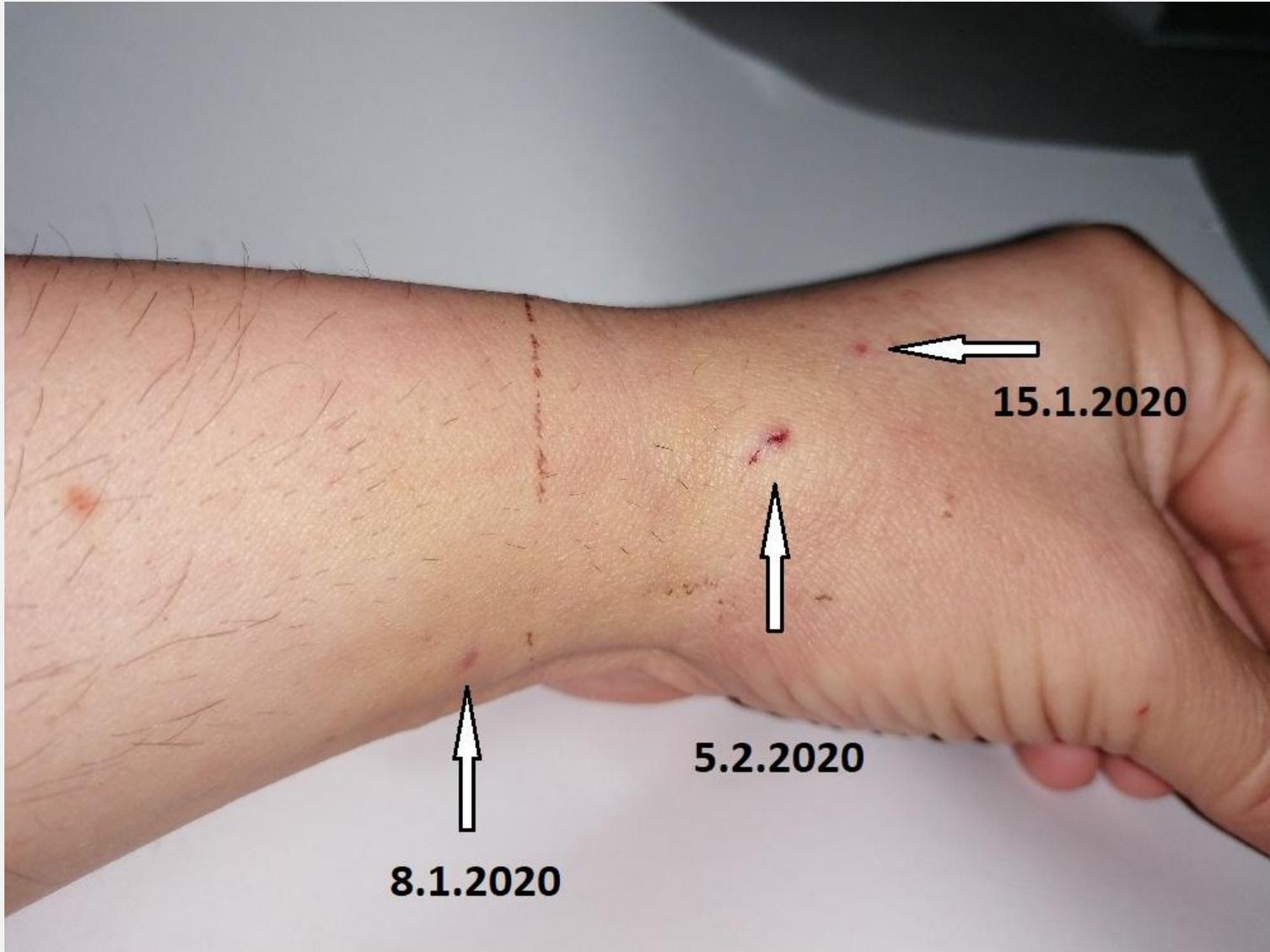
“Snuffbox“



Dorsal/Distal radial access



DRA approach example in Faculty Hospital Pilsen



49 year old male with MVD:

- 1. Proximal (conventional) TRA**
- 2. Dorsal access**
- 3. „Snuffbox“**

1. 8.JAN.2020 - primary PCI (RCA)
2. 15.JAN.2020 - staged PCI (RIA, Cx)
3. 5.FEB.2020 - iFR and second staged PCI

On-line congress - February 2021

**Japanese Association of
Cardiovascular Interventi
and Therapeutics**



PATIENT CHARACTERISTICS

| Characteristics | <i>N</i> = 115 |
|---------------------------|------------------------------------|
| Female | 23 |
| Age (years) | 67 (\pm 10) (range 40–86) |
| BMI (kg/m ²) | 30 \pm 5 |
| Hypertension | 87 (76) |
| Hypercholesterolemia | 80 (70) |
| DM | 47 (40) |
| Smoker | 34 (30) |
| Prior MI | 20 (17) |
| Prior catheterization/PCI | 28 (24) |
| ASA | 81 (70) |
| P2Y12 | 48 (42) |
| OAT | 20 (17) |

Data expressed as absolute (relative %) frequencies; age and BMI are expressed as mean values \pm standard deviation

BMI body mass index, *DM* diabetes mellitus, *MI* myocardial infarction, *PCI* percutaneous coronary intervention, *AT* antithrombotic therapy, *OAT* oral anticoagulation treatment—NOAC or warfarin

PROCEDURAL CHARACTERISTICS

| Procedural characteristics | <i>N</i> = 115 (%) |
|--------------------------------|--------------------|
| SB/DDRA | 83 (72) |
| DDRA | 32 (28) |
| Left/right DRA | 111 (97)/4 (3) |
| Indication for catheterization | |
| Stable CAD/diagnostic | 99 (86) |
| Elective PCI | 10 (9) |
| ACS | 6 (5) |
| GSS 5F/6F | 109/6 (95/5) |
| Contrast media (ml) | 128 ± 55.9 |
| Fluoro time (min) | 6.8 ± 5.8 |
| Same day discharge | 65 (56) |
| CAG | 76 (66) |
| (CAG+) PCI | 39 (34) |
| Compression time (min) | 80 ± 39 |

Data expressed as absolute (relative %) frequencies, continuous variables as mean value ± standard deviation



RESULTS OF US MEASUREMENTS AND COMPLICATION RATE

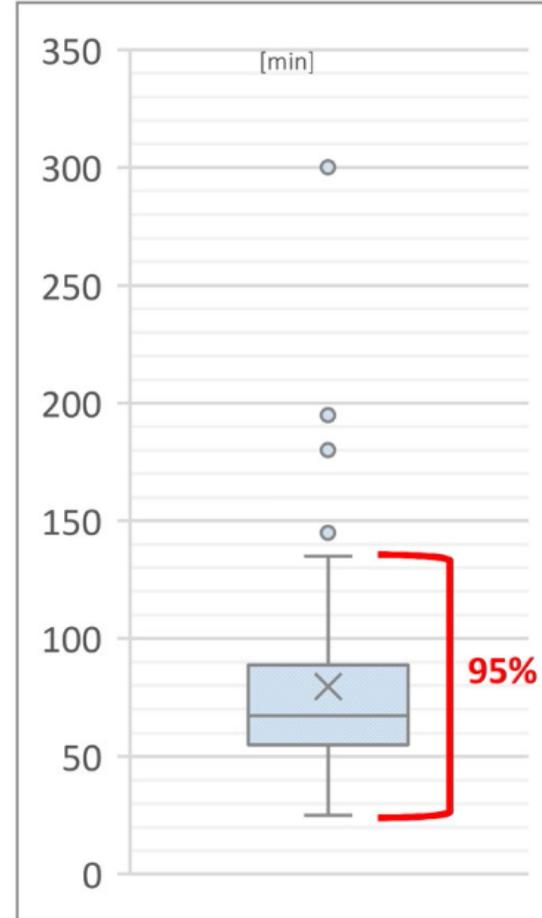
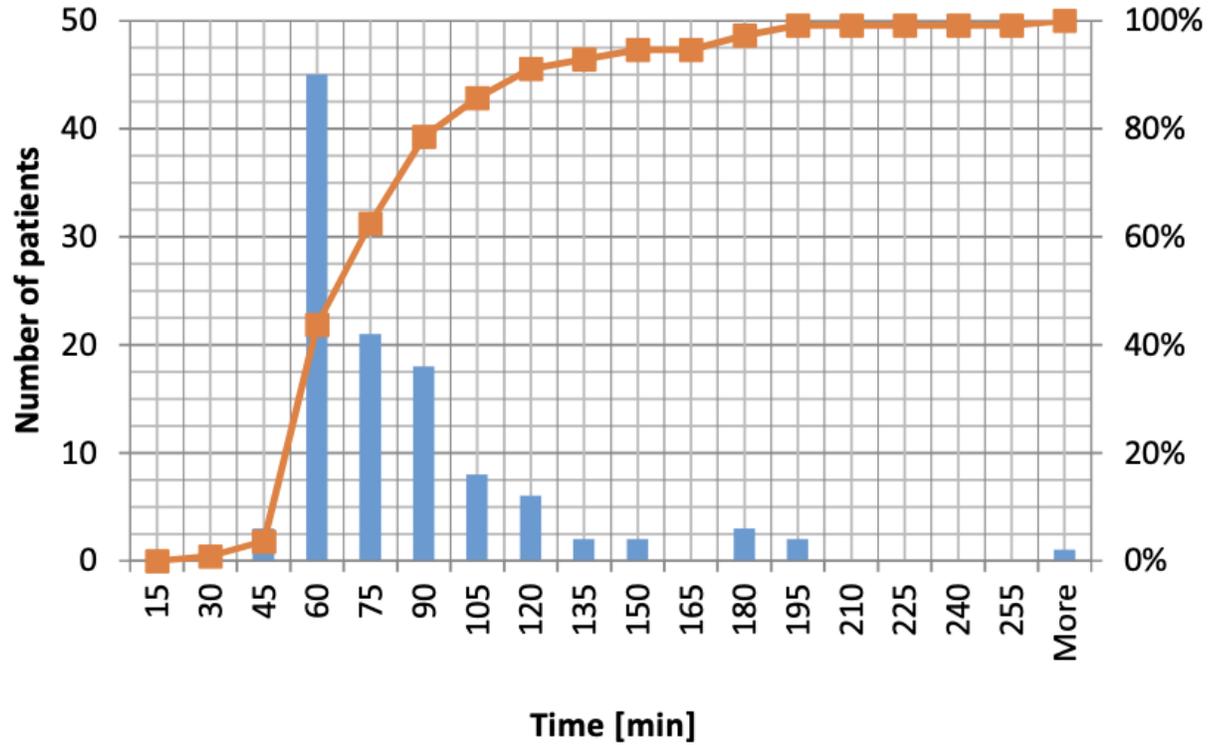
| | Diameter ($n = 115$) | F ($n = 23$) | M = (92) | Local hematomas > 2 cm | RAO |
|-----|------------------------|----------------------------|----------------------------|------------------------|-----|
| DRA | 2.28 ± 0.49 | $2.25 \pm 0.11^{\text{¶}}$ | $2.32 \pm 0.05^{\text{¶}}$ | 0 | 0 |
| PRA | 2.86 ± 0.49 | $2.56 \pm 0.41^{\#}$ | $2.93 \pm 0.49^{\#}$ | NA | 0 |

$\#p < 0.001$, ¶NS

Diameters in mm expressed as mean \pm standard deviation, RAO, and complications as frequencies

PRA proximal radial artery, *SB* anatomical snuffbox, *DDRA* distal distal (dorsal) radial artery, *RAO* radial artery occlusion

Distribution of compression times

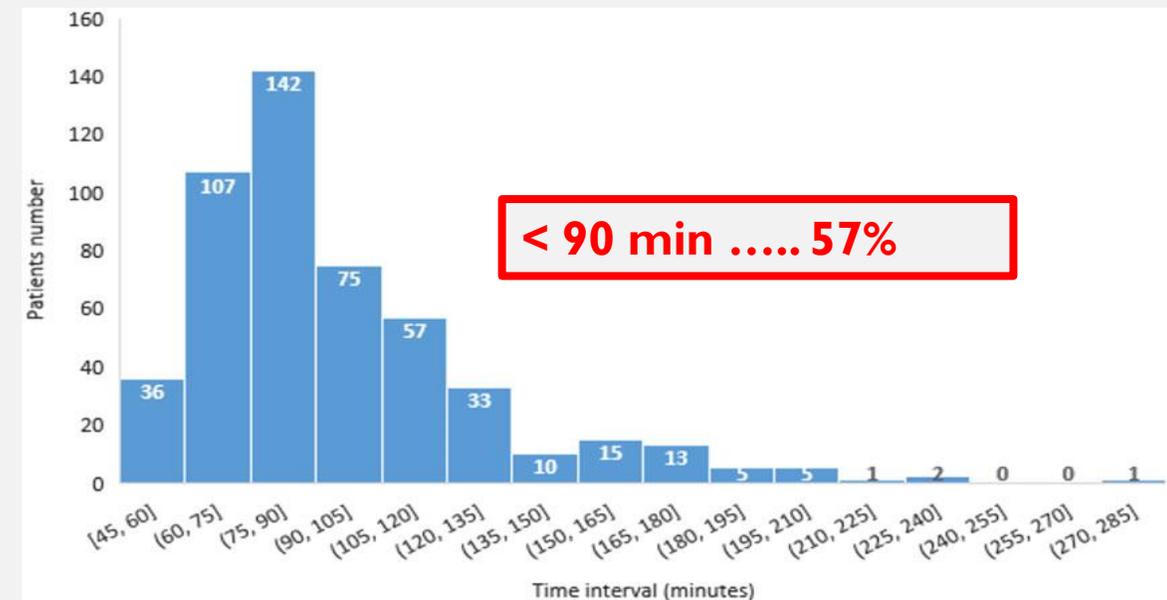
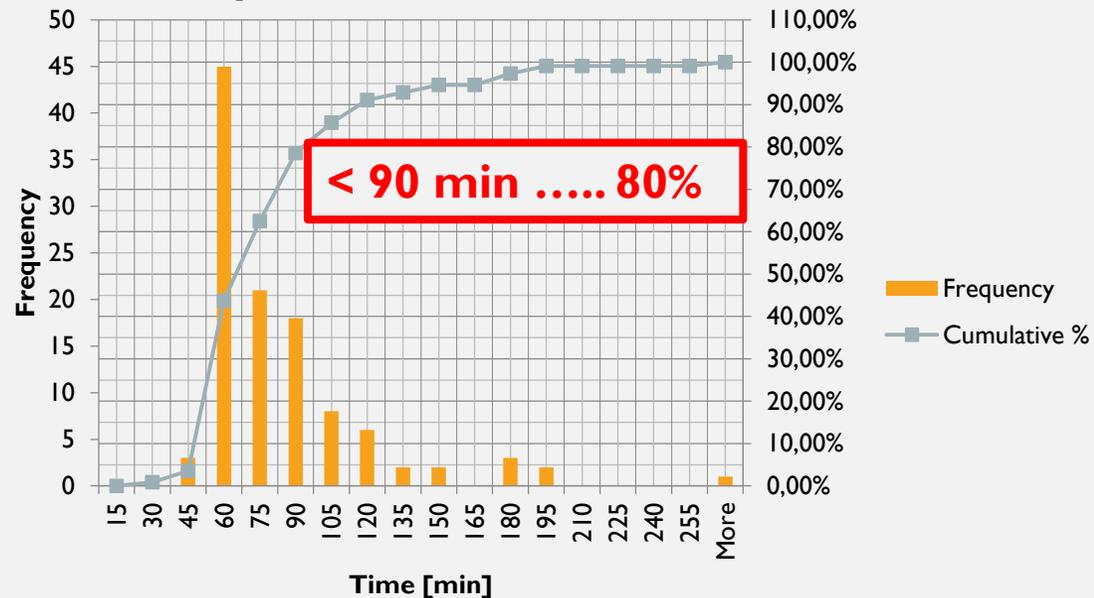


COMPRESSION TIME DTRA VS CTRA

80 min

98 min

Compression time distribution



Jirouš, Š., Bernat, I., Slezák, D., Miklík, R., & Rokyta, R. (2020). Post-procedural radial artery occlusion and patency detection using duplex ultrasound vs. the reverse Barbeau test. *European Heart Journal Supplements : Journal of the European Society of Cardiology*, 22, F23 - F29.

TR Band compression device modification



In DRA there is no need to perform complex perfusion haemostasis protocol!

SIMPLIFIED HEMOSTASIS PROTOCOL FOR DRA

Cathlab

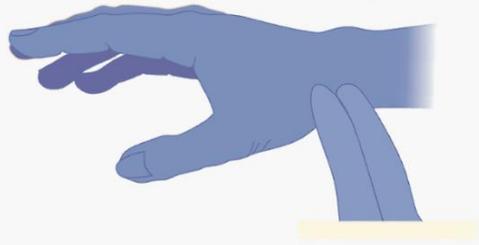
1. TR Band is inflated to 12 ml when patient is still on the table and sheath is removed
2. Pressure is reduced to minimum without bleeding. Note residual air volume in the TR Band
3. Repeat step 2. again before leaving cathlab

Radial lounge or ward

1. Decrease again to minimal pressure every 20 min (usually 2–3 ml) and note residual pressure
When pressure is off wait 30 min for safety and remove the device
 2. In case of bleeding increase the pressure to stop it and note the residual volume and carry on with the protocol
-

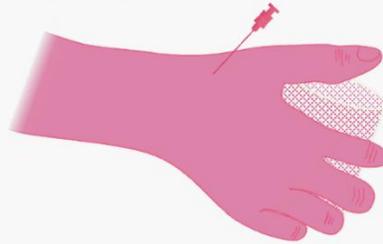
FUTURE OF DTRA

Palpable distal radial artery pulse



Yes

Distal radial access



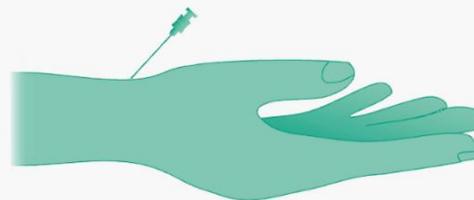
Successful

Untroubled hemostasis



Failed

Conventional transradial access



Successful

Supervised hemostasis



No