

RADIAL ACCESS
in endovascular surgery

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CHU RENNES

why radial access

- CI of femoral Access
 - Less entry site complications : 0.3% vs 2.8%
 - Association kardegic plavix
 - Ambulatory
 - COST
-
- Artery: Vertébral , méésentéric , renal iliac artery
 - Femoral with specific device

CI FEMORAL ACCESS

- OBESITY
- CALCIFICATIONS OF FEMORAL ACCESS
- SEPSIS

Femoral Complication Waiting to Happen!



risk factors of complications in femoral access:

Hematoma-bleeding-RPH

Patient related:

- Female gender
- Older
- Hypertension
- Obesity
- Low weight
- Renal failure
- Platelet low count

Procedural related:

- Level of puncture site
- Larger arterial sheath
- Prolonged sheath time
- Concomitant venous sheath
- Need for repeat intervention

Drug related:

- Over anticoagulation
- GP IIb/IIIa inhibitors
- Thrombolytic

Predictors of RPH after PCI

<1%

Independent predictors:

- female gender OR 5.44 (1.66-17.9) p<0.05
- high puncture site OR 5.26 (1.41-19.3) p<0.01
- BSA <1.73 m² OR 7.05 (1.65-30.02) p <0.008

Variable	Patients	Controls	Univariate Analysis	
			OR (95% CI)	p Value*
Gender (female)	73%	26%	7.75 (2.65–22.73)	<0.0001
BSA (<1.73 m ²)†	46%	13%	5.86 (1.85–18.55)	0.002
Hypertension	65%	74%	0.66 (0.24–1.85)	0.43
Diabetes mellitus	23%	24%	0.95 (0.31–2.91)	0.92
Nonemergent PCI	62%	44%	1.84 (0.67–5.08)	0.34
Previous femoral artery puncture	50%	62%	0.61 (0.24–1.60)	0.31
High femoral puncture	55%	16%	6.33 (1.82–21.74)	0.004
Arterial sheath size (≥7-F)	50%	35%	1.88 (0.72–4.96)	0.20
Venous sheath insertion	27%	29%	0.92 (0.32–2.67)	0.88
Heparin (>85 U/kg)	58%	41%	1.97 (0.74–5.26)	0.17
Glycoprotein IIb/IIIa use	69%	61%	1.43 (0.52–3.92)	0.49
Vascular closure device	85%	72%	2.13 (0.62–7.33)	0.23

Femoral access : complications

Pseudoaneurysm

- Incidence < 1%-6%
- Risk factors
 - Low puncture site
 - Female >70yrs
 - Diabetes
 - Obesity

Femoral access : complications

AV Fistula : Incidence <0.4%

Ischemia-Thrombosis-Emboli

:Incidence < 1%

- Risk factors
 - Large sheath/small artery
 - PVD
 - Iatrogenic dissection
 - Thrombus within sheath

Infrequent complication

Neuropathy

- Due to nerve injury
 - during arterial puncture
 - Secondary to compression (hematoma)

Infections

- Risk factor:
 - Reintervention at same site
 - Hematoma formation
 - Prolonged sheath placement
 - Closure device + +

Radial Versus Femoral Approach for Percutaneous Coronary Diagnostic and Interventional Procedures

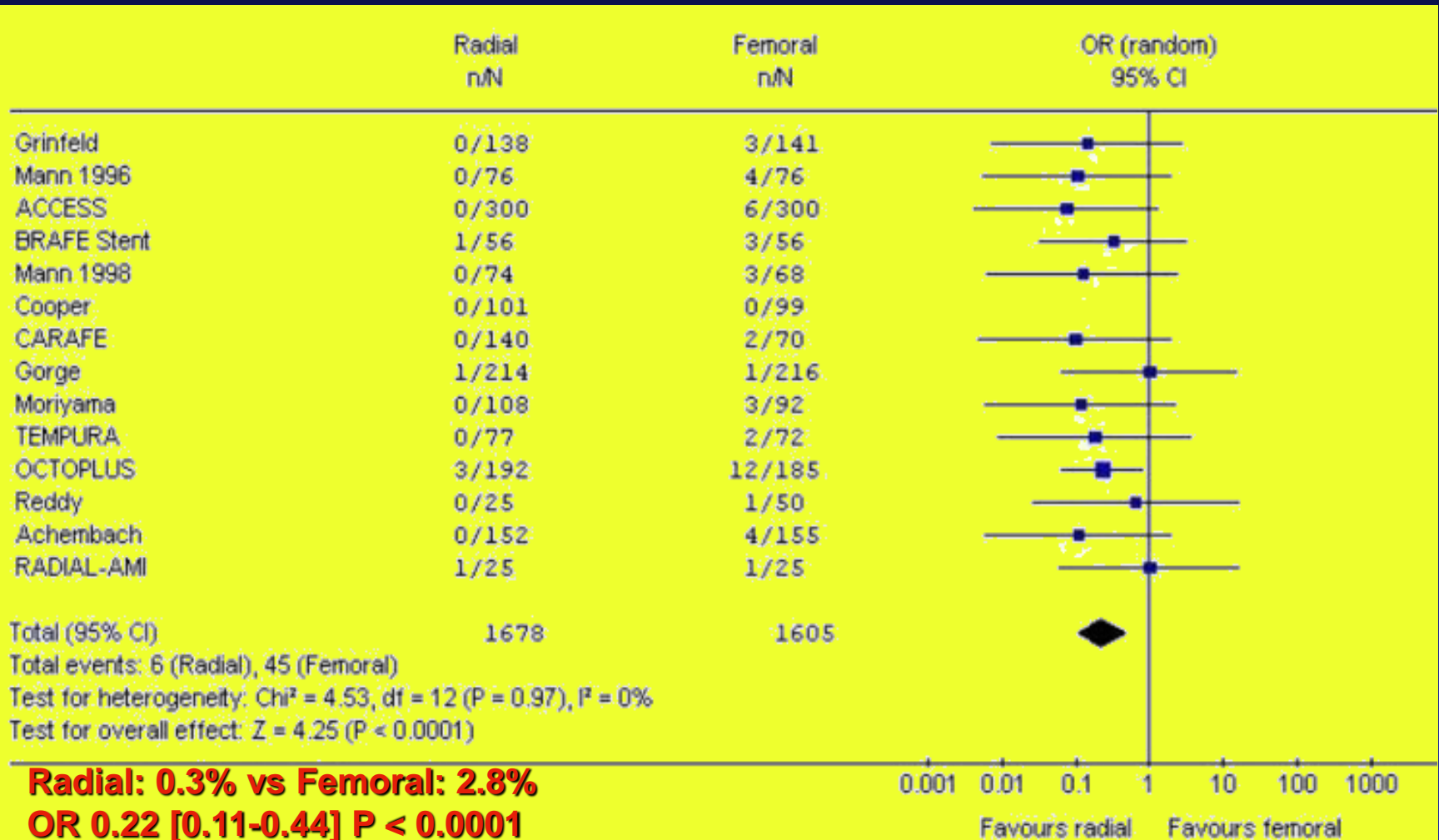
Systematic Overview and Meta-Analysis of Randomized Trials

Pierfrancesco Agostoni, MD,* Giuseppe G. L. Biondi-Zoccai, MD,† M. Luisa De Benedictis, MD,* Stefano Rigattieri, MD,† Marco Turri, MD,* Maurizio Anselmi, MD,* Corrado Vassanelli, MD,‡ Piero Zardini, MD,* Yves Louvard, MD,§ Martial Hamon, MD||

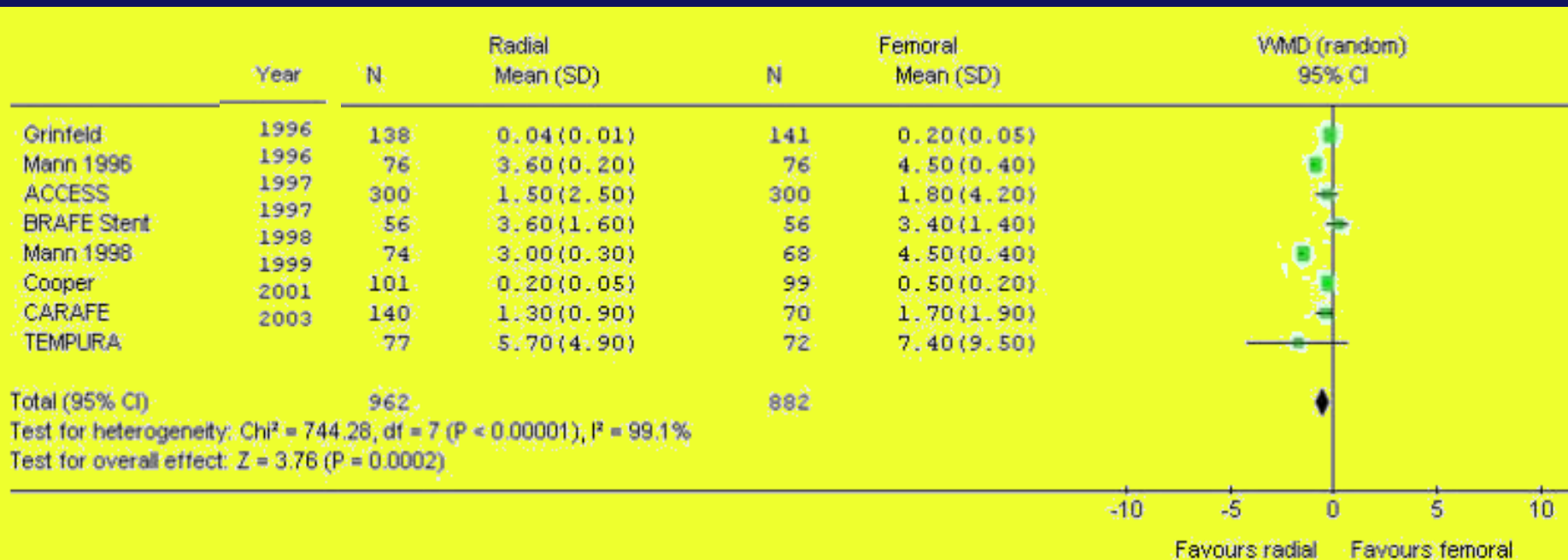
Verona, Rome, and Novara, Italy; and Massy and Caen, France

- OBJECTIVES** We sought to compare, through a meta-analytic process, the transradial and transfemoral approaches for coronary procedures in terms of clinical and procedural outcomes.
- BACKGROUND** The radial approach has been increasingly used as an alternative to femoral access. Several trials have compared these two approaches, with inconclusive results.
- METHODS** The MEDLINE, CENTRAL, and conference proceedings from major cardiologic associations were searched. Random-effect odds ratios (ORs) for failure of the procedure (crossover to different entry site or impossibility to perform the planned procedure), entry site complications (major hematoma, vascular surgery, or arteriovenous fistula), and major adverse cardiovascular events (MACE), defined as death, myocardial infarction, emergency revascularization, or stroke, were computed.
- RESULTS** Twelve randomized trials ($n = 3,224$) were included in the analysis. The risk of MACE was similar for the radial versus femoral approach (OR 0.92, 95% confidence interval [CI] 0.57 to 1.48; $p = 0.7$). Instead, radial access was associated with a significantly lower rate of entry site complications (OR 0.20, 95% CI 0.09 to 0.42; $p < 0.0001$), even if at the price of a higher rate of procedural failure (OR 3.30, 95% CI 1.63 to 6.71; $p < 0.001$).
- CONCLUSIONS** The radial approach for coronary procedures appears as a safe alternative to femoral access. Moreover, radial access virtually eliminates local vascular complications, thanks to a time-sparing hemostasis technique. However, gaining radial access requires higher technical skills, thus yielding an overall lower success rate. Nonetheless, a clear ongoing trend toward equalization of the two procedures, in terms of procedural success, is evident through the years, probably due to technologic progress of materials and increased operator experience. (J Am Coll Cardiol 2004;44:349-56) © 2004 by the American College of

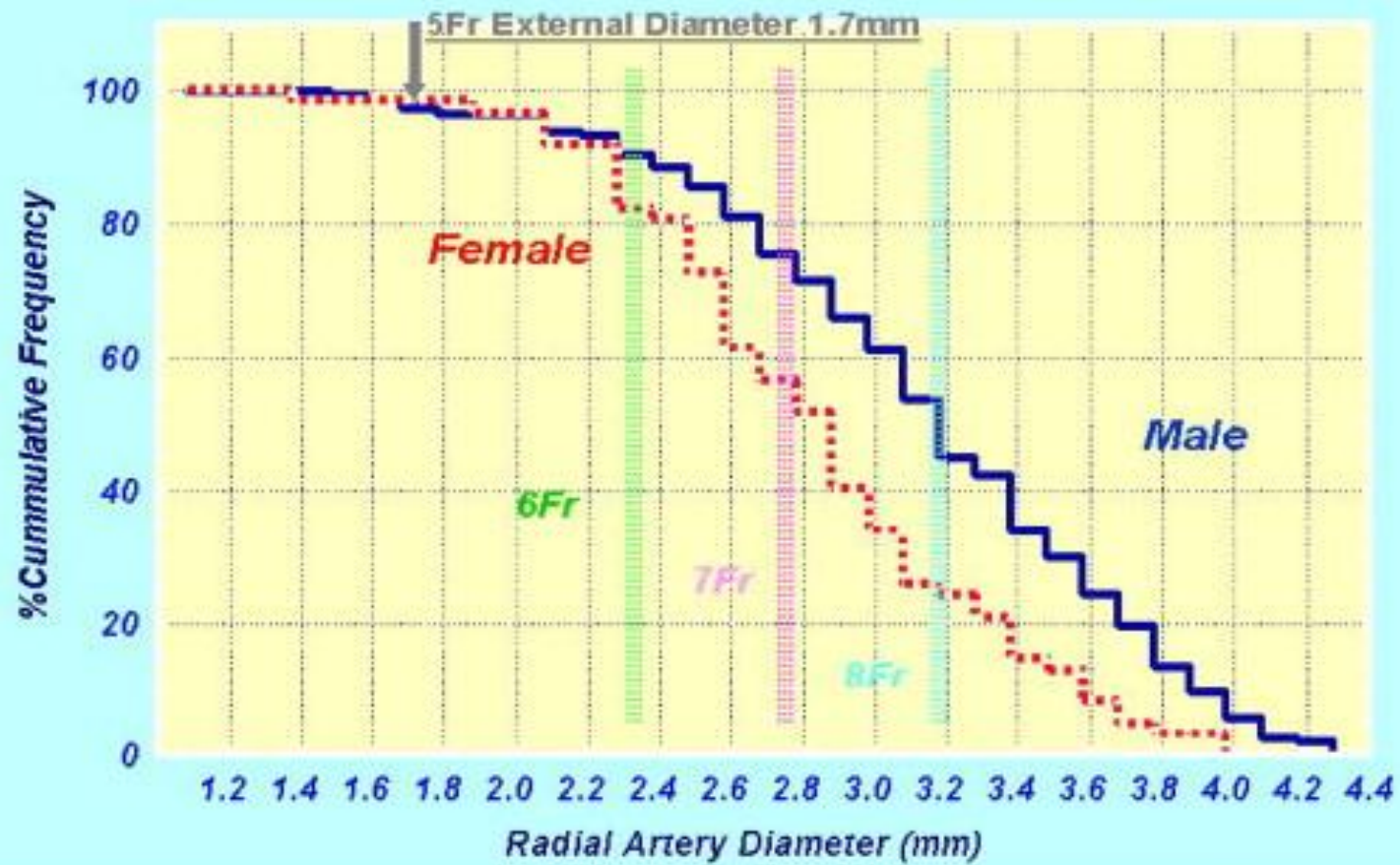
Entry site complications



Length of hospital stay



Radial: 1.8 Days vs Femoral: 2.4 Days
WMD - 0.55 [- 0.82-0.29] P = 0.0002



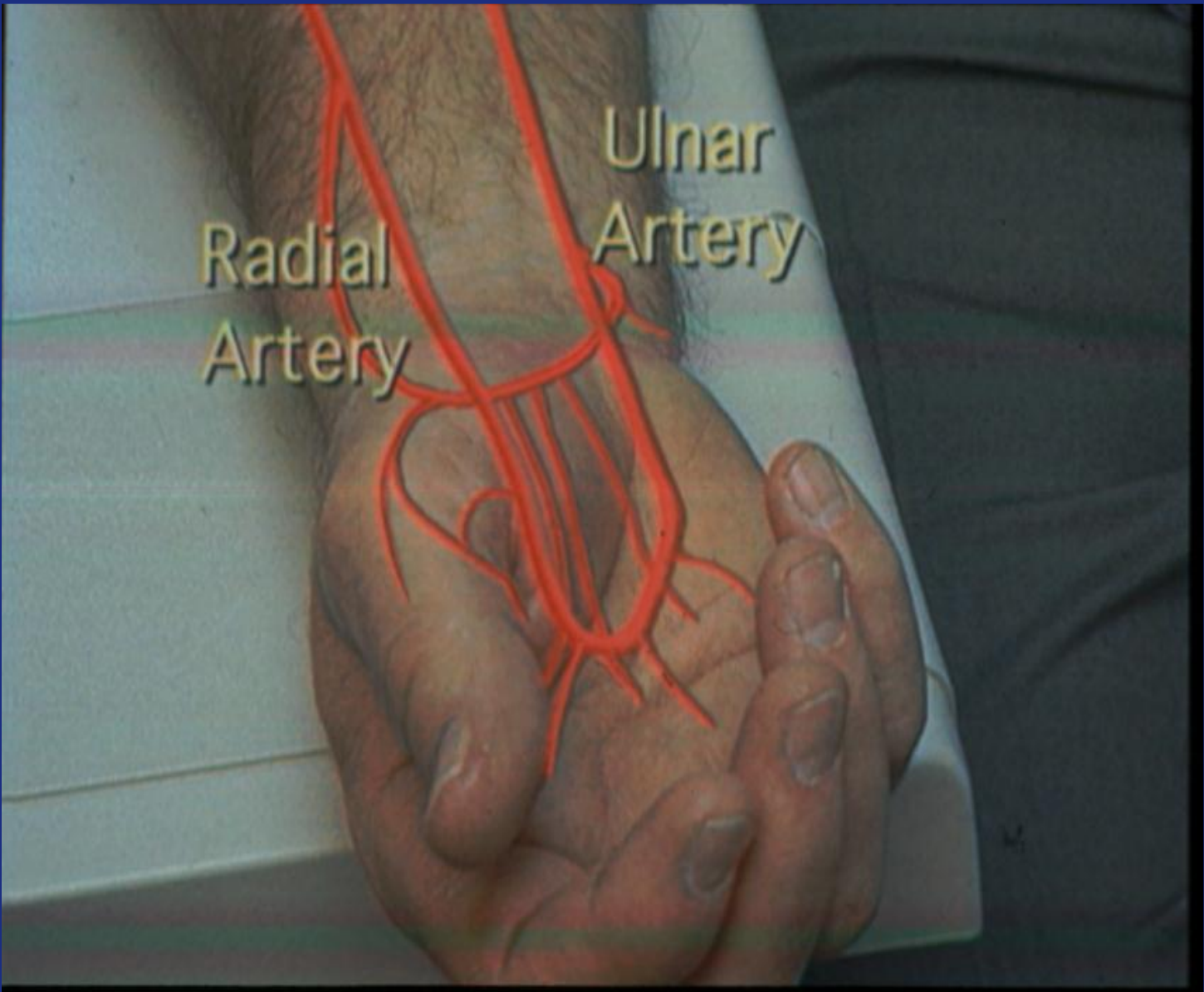
Allen's Test



Allen's Test

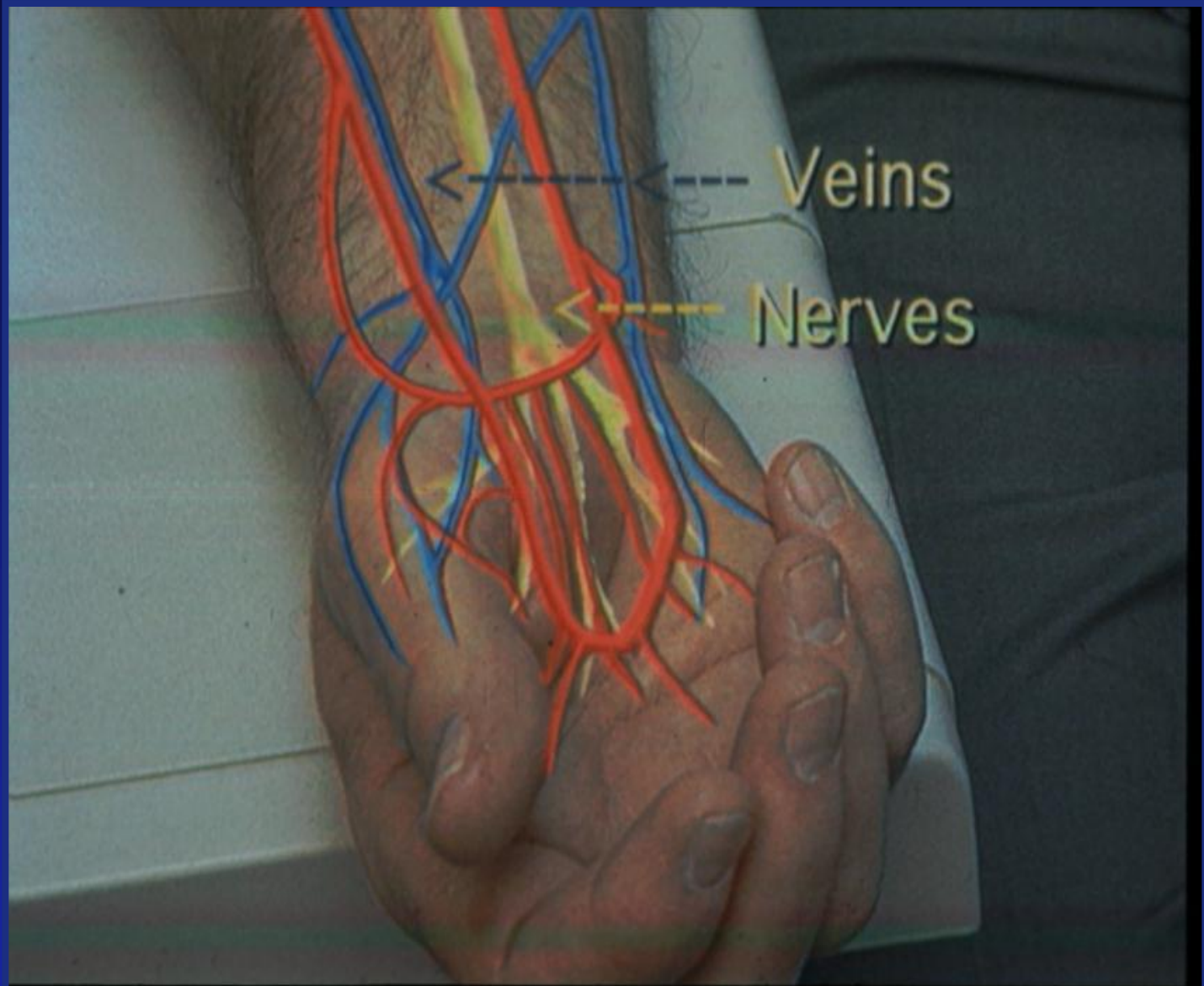


If doubt => barbeau test
(oxymetry on thumb after 2 mm radial compression)



Radial
Artery

Ulnar
Artery



RADIAL ACCESS

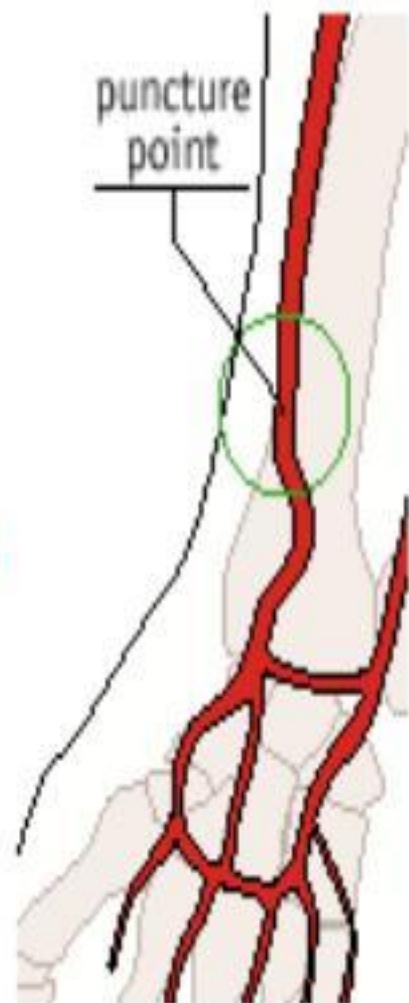
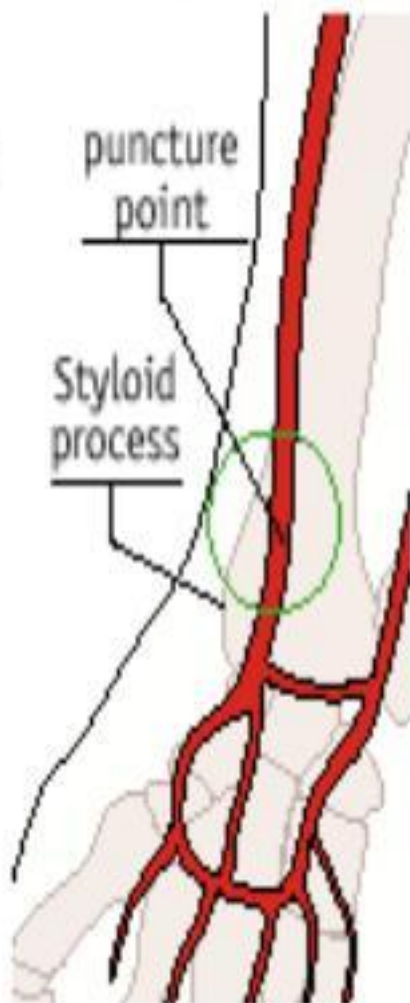
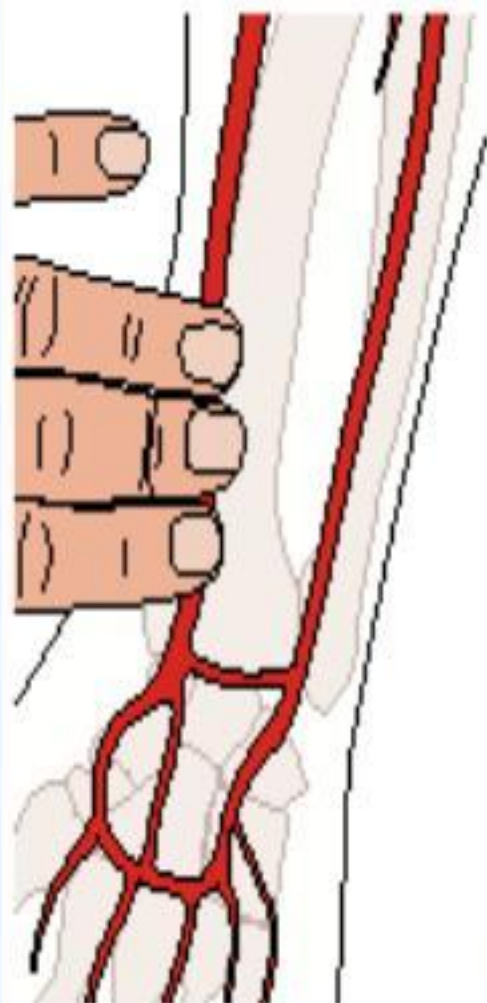


Fig. 3a.

Fig. 3b.

Fig. 3c.

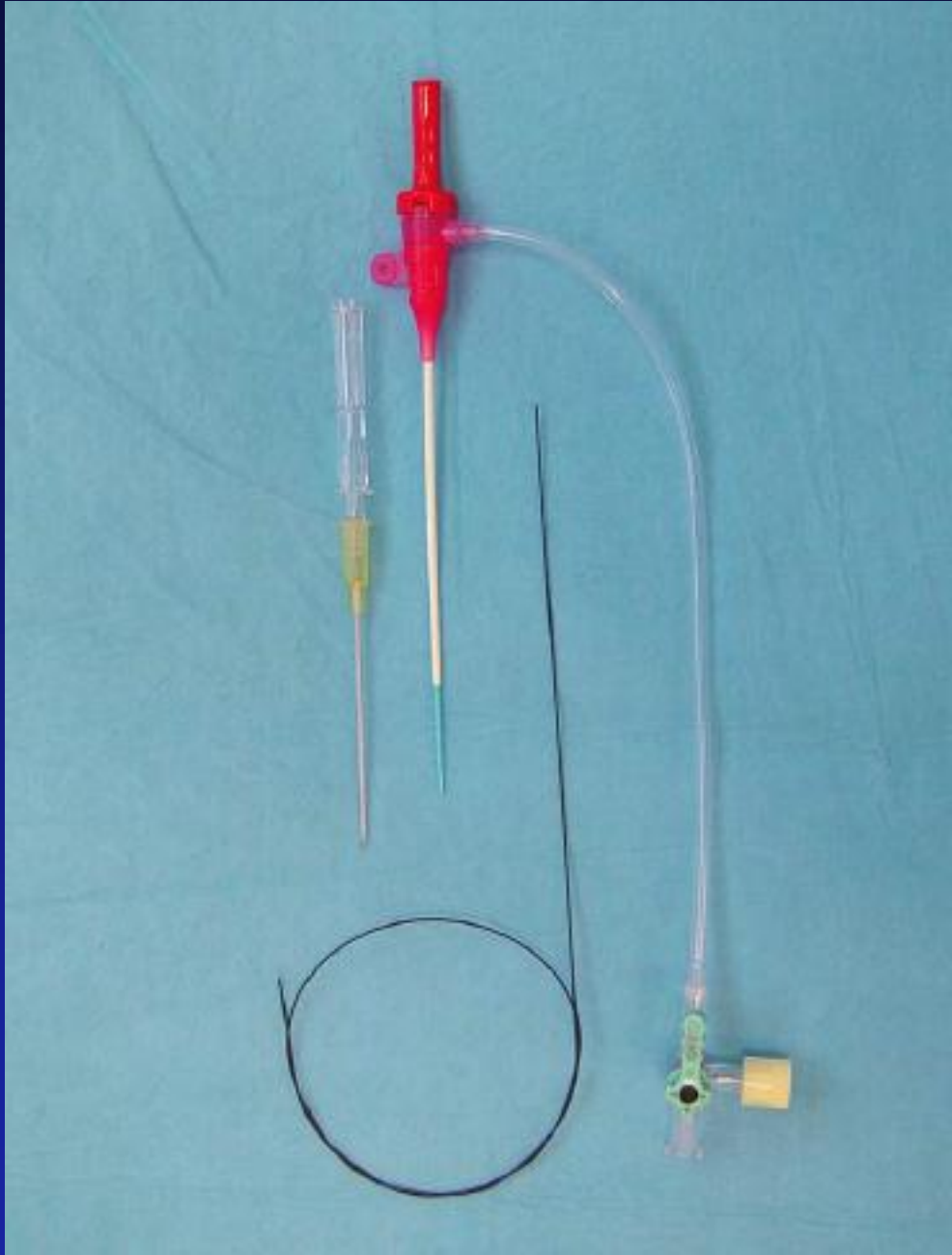
Fig. 3d.



OEC

EUROTEC

BIOHAZARD











Anatomic variation:10%

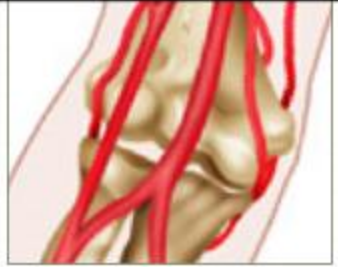
- Hypoplasia: 1.7%
- Tortuosity : 5.2%
- stenosis:1.7%
- loop radio cubital:0.9%

– Risk of perforation or dissection : rare

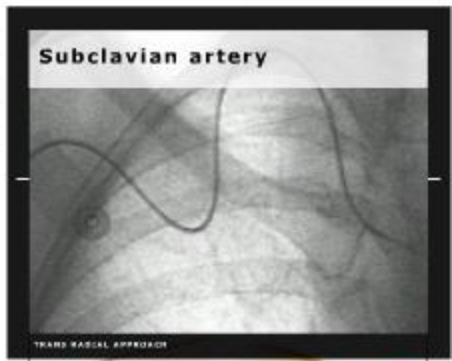
Yokoyama : cath cardiovac diag ,2000

Anatomic variations

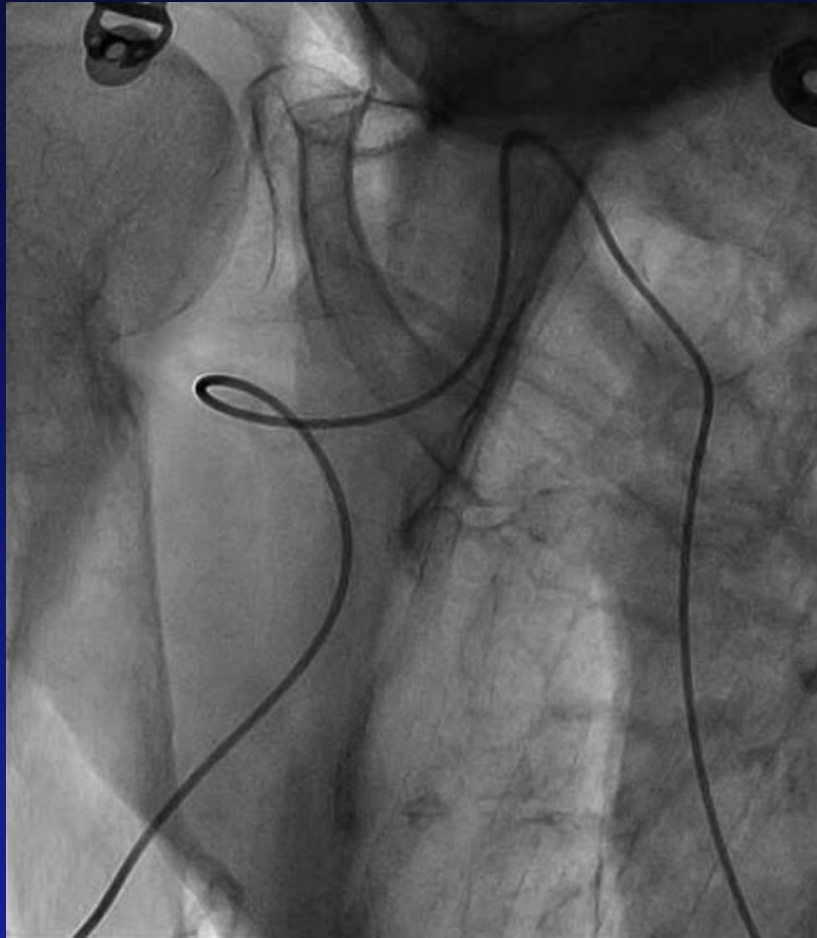
Loops and tortuosities



SPASM
HAEMATOMA
Delayed Haematoma



- Never forced
- Fluoroscopic guidance
- Hydrophilic wire
- Alternative approach



RADIAL LOOP & RADIAL RECURRENT ARTERY



contre indication?

- Test allen ?
- Women?
- Anatomic variation?
- Raynaud syndrome?
- Renal insufficiency++++

90% ELIGIBLE

- Duplex scan
- Sedation
- Verapamyl 5 mg + heparine
- Hydrophil guide wire
- soft
- Radio if dobt

Complications of radial access

- Spasm : 5%
- Thrombosis: 5% but < 1% symptomatique
- perforation : < 0.01%
(compartment syndrome)
- major Hemorrhage : <0.5%

Radial Spasm



➤ Painful for patient

Risk factors:

- Anxiety
- Age
- Gender
- Smoker
- Sheath diameter
- Number of cath
- Learning curve

Sedation and Verapamil Virtually Eliminate the Spasm Problem



Before

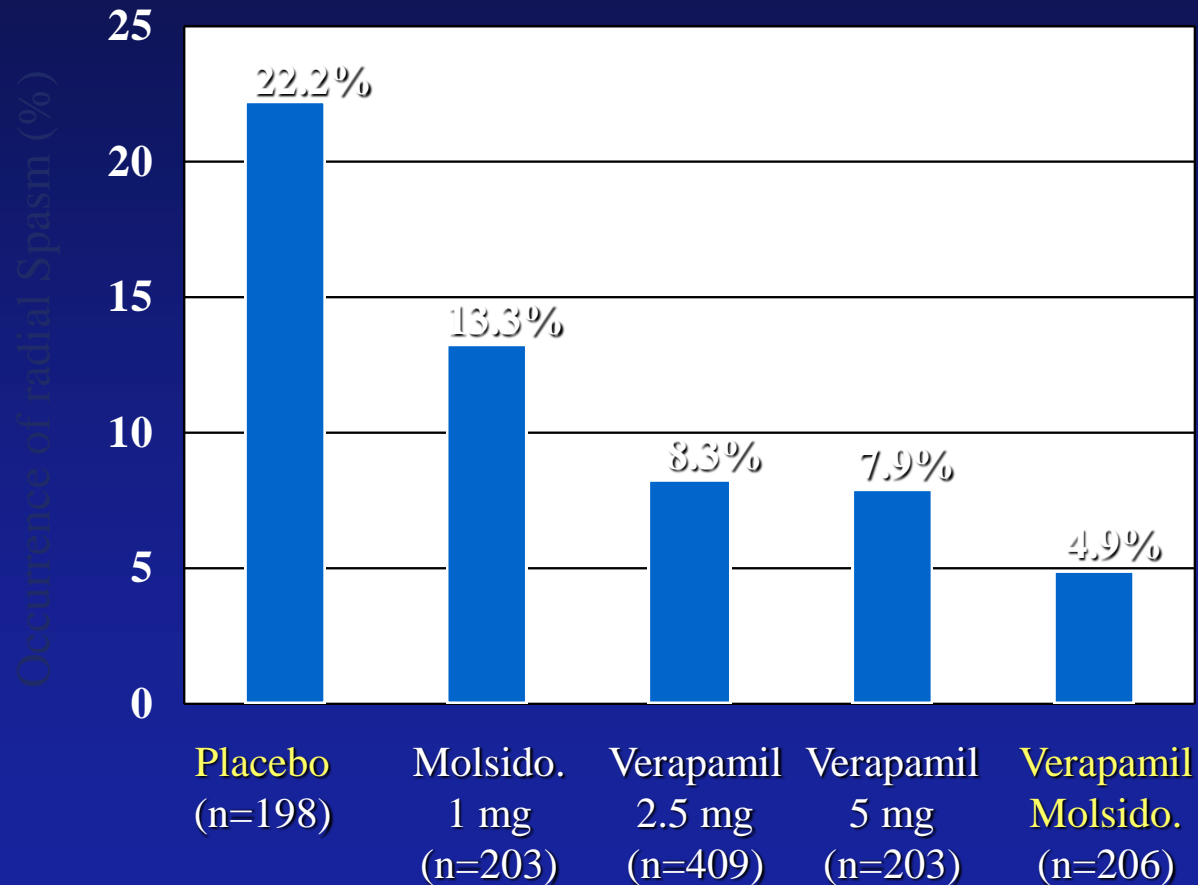


After

Prevention of Arterial Spasm in TRI

The SPASM Study

1,219 consecutive patients randomized in 4 groups



Risk factor of radial thrombosis

sheath diameter

Ratio radial diameter / sheath

Spasm

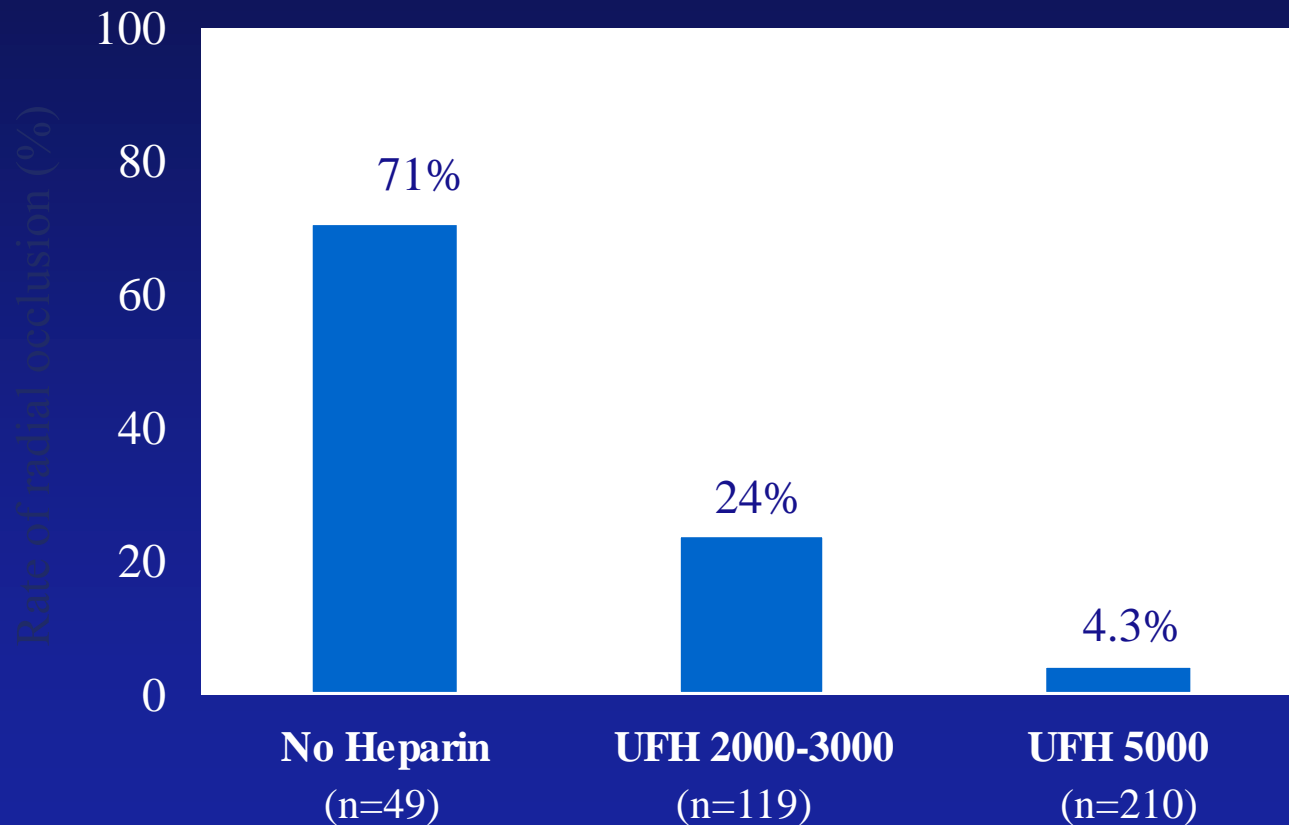
No coagulation

Repeat ponction

Prevention of Radial Occlusion Anticoagulation

415 consecutive patients
Radial artery occlusion assessment:
- post-procedure and 2 months later

Asymptomatic 100%



Radial Artery Occlusion

- 1372 Procedures
 - Asymptomatic Radial Thrombus 4.7%
 - Symptomatic Radial Thrombus 0.2%
 - Significant Hematoma 0.2%
 - Significant Pseudoaneurysm 0.2%
- Worst Complication
 - Compartment Syndrome 1 Case

Radial Artery Occlusion

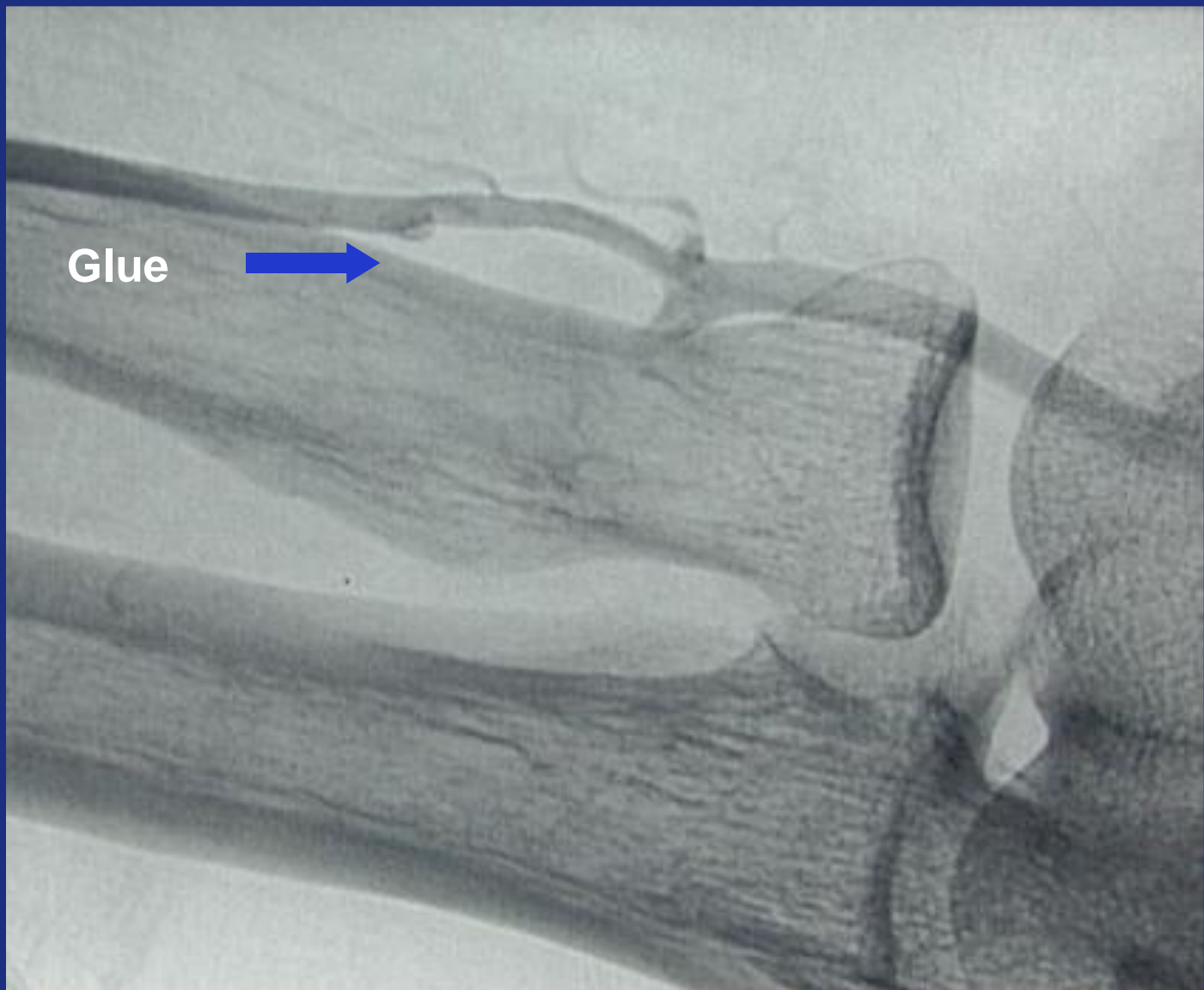
1372 Patients

Catheter Size	%
4-5 French	0
6 French	4.9
7 French	3.7
8 French	9.3

Radial Artery Perforation



Radial Perforation - Repaired



Preventive Action+++

Complications

Forearm hematoma



Rare complications after radial access

Haematoma at the vascular access site

Haematoma at the level of forearm (small collateral effraction)

Arteriovenous fistula

False anevrysm

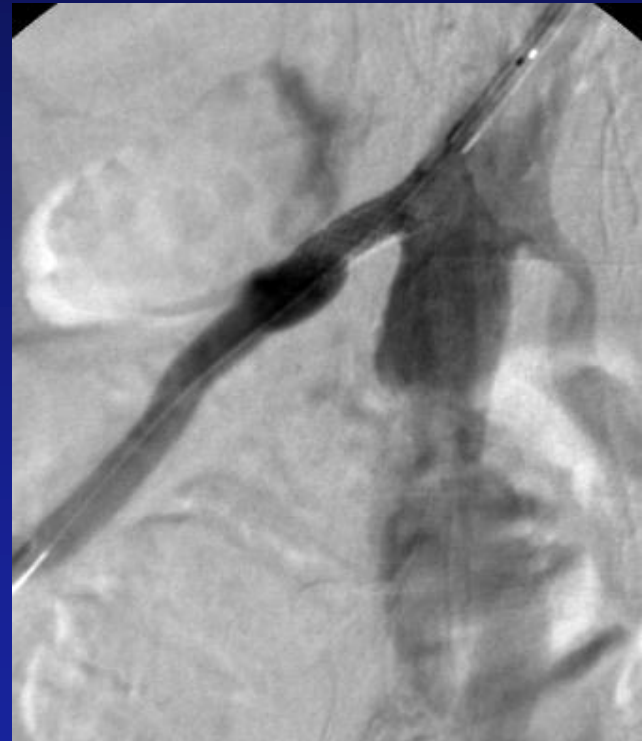
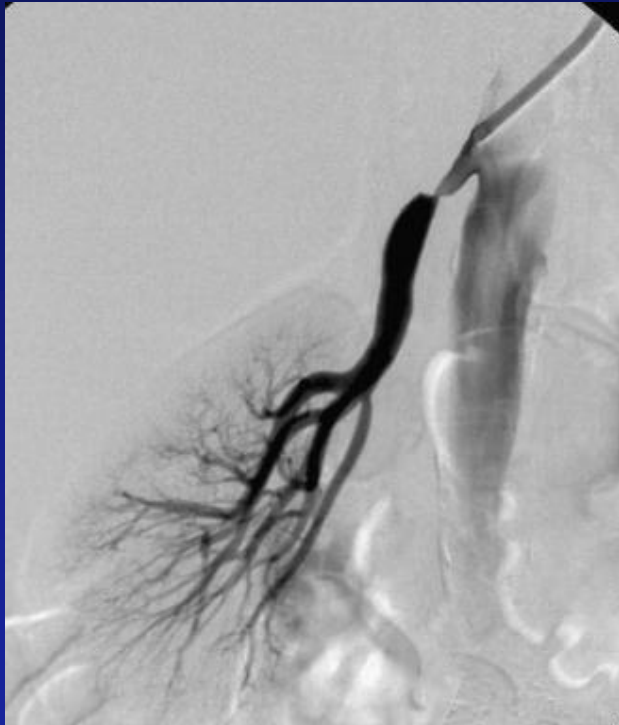
Causalgia (due to nerve injury during arterial puncture)

Refractory spasm during and delayed after the procedure (painful)

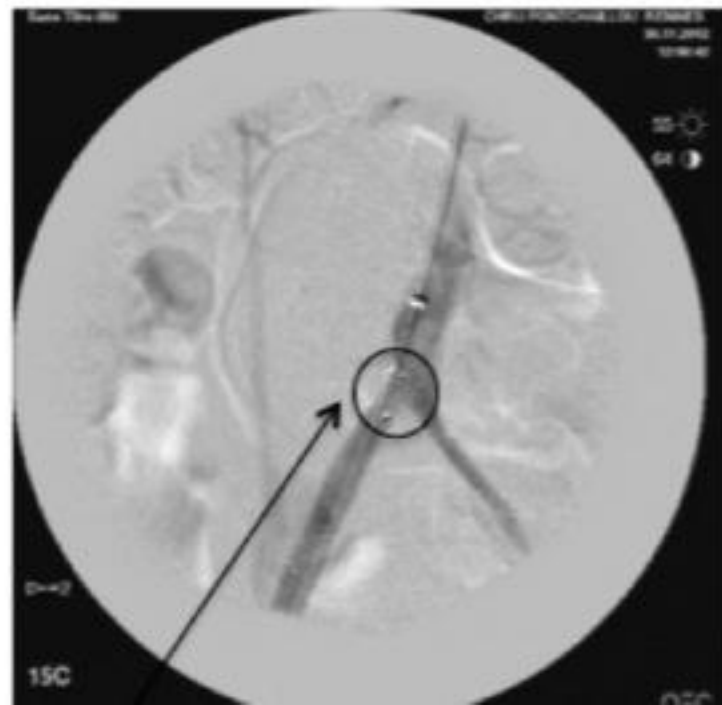
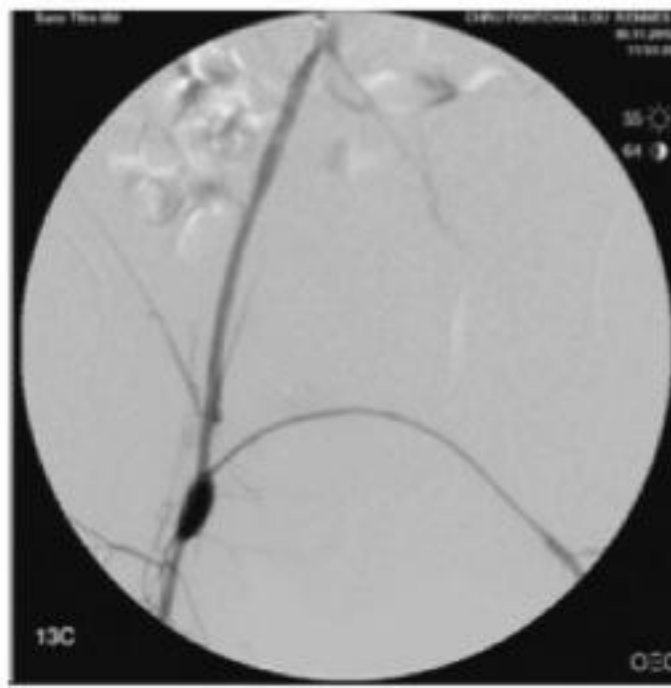
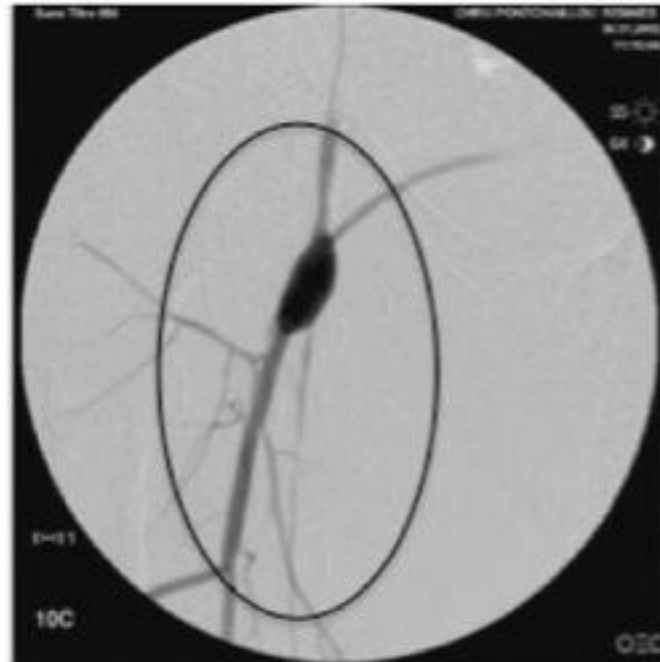
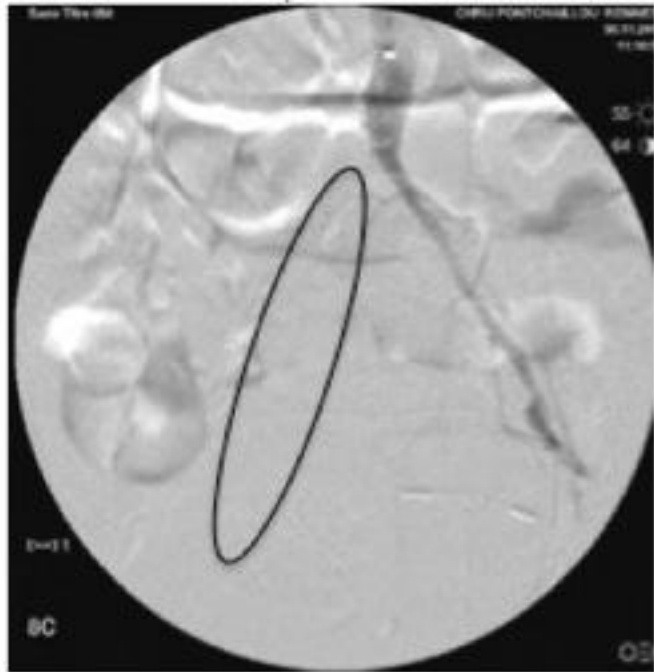
Radial artery eversion during sheath removal

Causalgia (due to inadequate arterial time compression)

Delayed haemorrhage (a few days)



(dr commeau)



Conclusion

- Learning curve
- All arteries can be treated (except btk) with specific device
- Less complication and ambulatory

Try and you adopt