

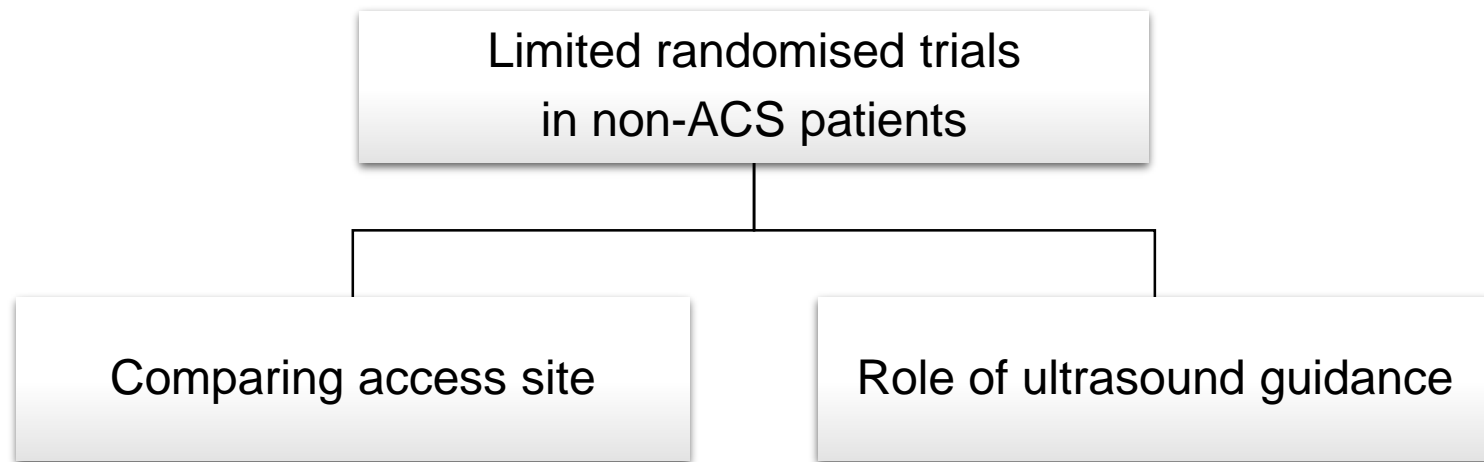
Standard vs. Ultrasound-guided Radial and Femoral access (SURF) – a randomised controlled trial

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I do not have any potential conflict of interest to declare



SURF Trial: unselected patients, with or without ACS

- Radial versus Femoral
- Ultrasound versus Standard

SURF

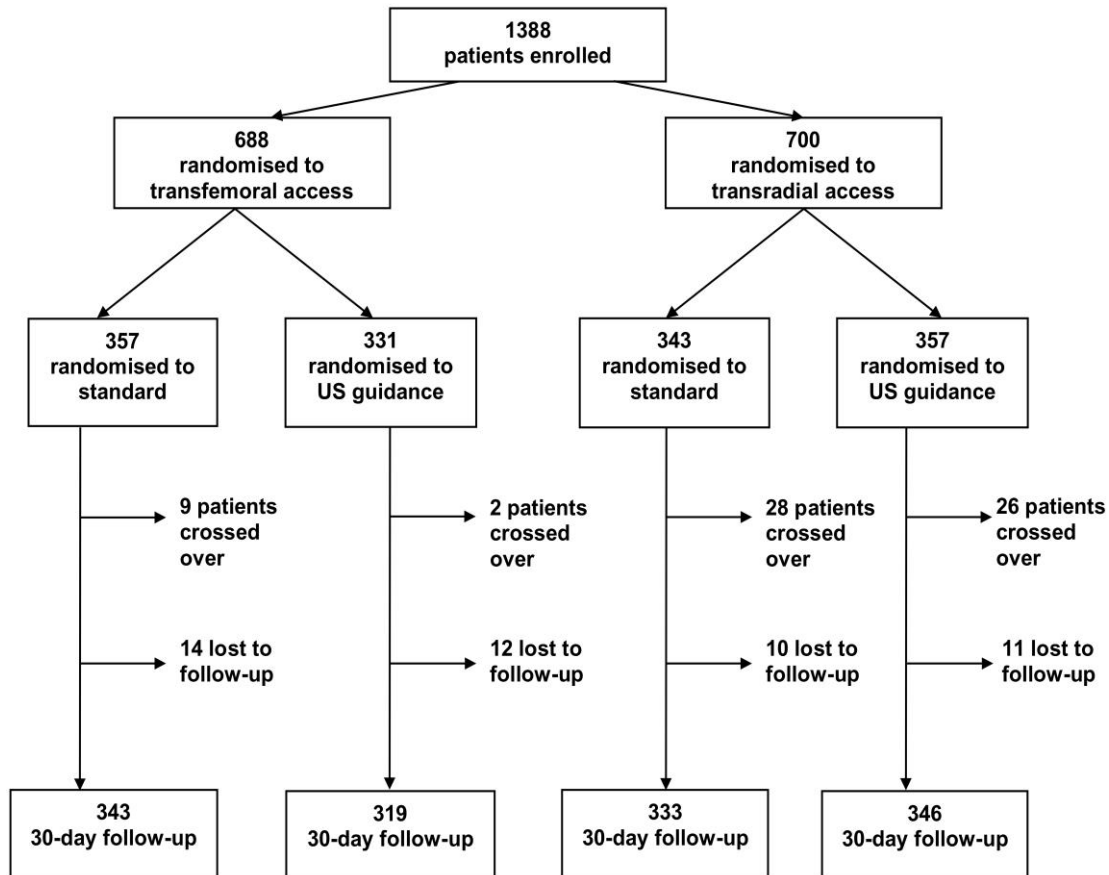
Prospective, randomised, 2x2 factorial design trial

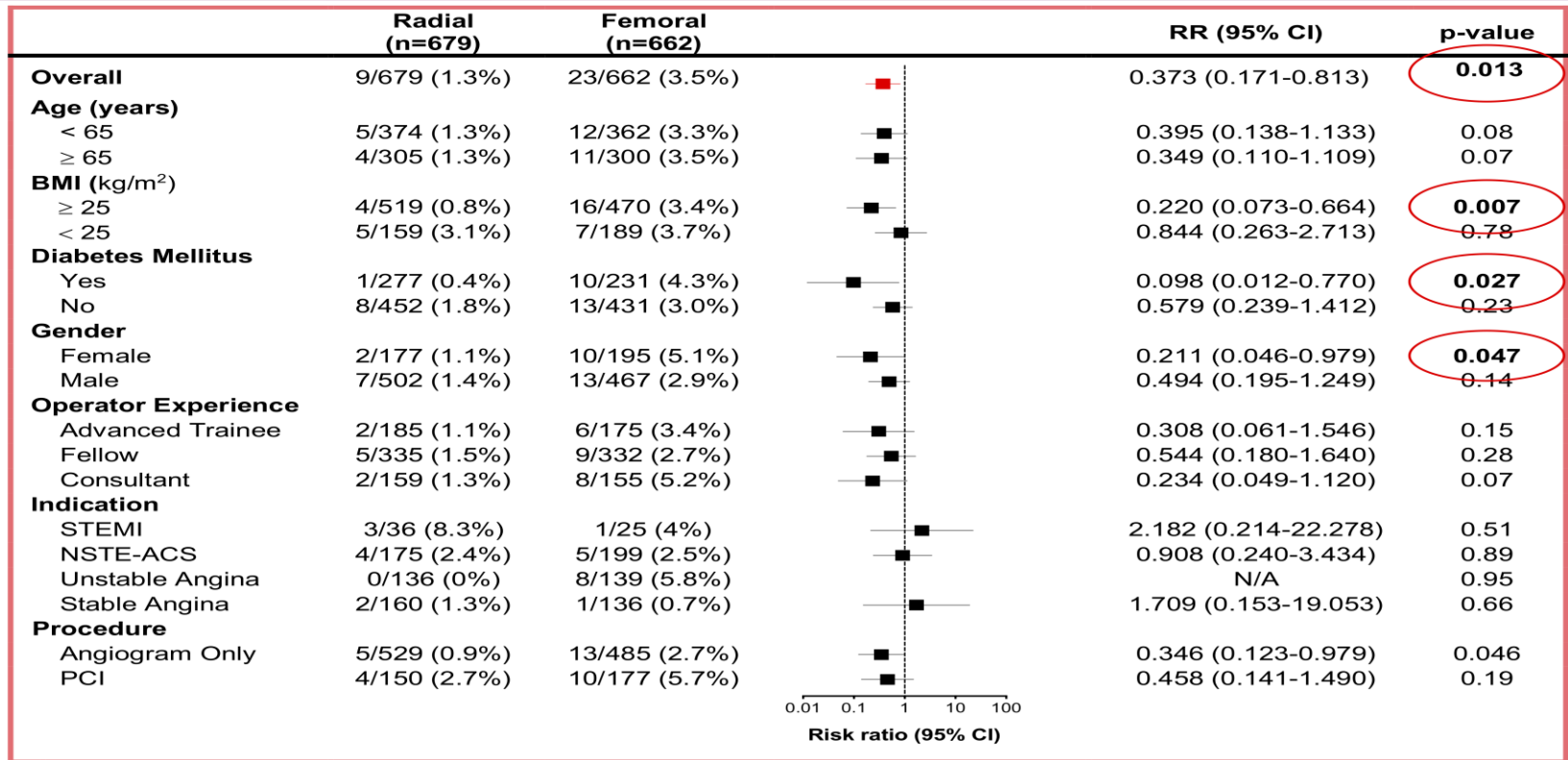
Primary outcome: composite of ACUITY major bleeding, MACE (death, stroke, myocardial infarction or urgent target lesion revascularization) and vascular complications

Secondary outcomes: access time, attempts, venepuncture, difficult accesses and first-pass success

How was the study executed?

- All patients referred to catheter labs
- All operators performed:
 - 75 PCIs
 - 50 radial
 - 50 femoral
 - 10 proctored US-guided both radial and femoral





Primary Composite Outcome based on access site

What are the essential results?

	Ultrasound (n=665)	Standard (n=676)		Risk Ratio (95% CI)	p-value
Overall	15/665 (2.3%)	17/676 (2.5%)		0.895 (0.443-1.806)	0.76
Age (years)					
< 65	7/365 (1.9%)	10/371 (2.7%)		0.706 (0.266-1.875)	0.49
≥ 65	8/300 (2.7%)	7/305 (2.3%)		1.166 (0.418-3.258)	0.77
BMI (kg/m²)					
≥ 25	8/501 (1.6%)	12/488 (2.5%)		0.644 (0.261-1.589)	0.34
< 25	7/163 (4.3%)	5/185 (2.7%)		1.615 (0.503-5.192)	0.42
Diabetes Mellitus					
Yes	5/218 (2.3%)	6/240 (2.5%)		0.915 (0.275-3.043)	0.89
No	10/447 (2.2%)	11/436 (2.5%)		0.884 (0.372-2.103)	0.78
Gender					
Female	6/198 (3.0%)	6/174 (3.5%)		0.875 (0.277-2.764)	0.82
Male	9/467 (1.9%)	11/502 (2.2%)		0.877 (0.360-2.136)	0.77
Operator Experience					
Advanced Trainee	2/153 (1.3%)	6/207 (2.9%)		0.444 (0.088-2.229)	0.32
Fellow	8/348 (2.3%)	6/319 (1.9%)		1.227 (0.421-3.577)	0.71
Consultant	5/164 (3.1%)	5/150 (3.3%)		0.912 (0.259-3.215)	0.89
Indication					
STEMI	1/32 (3.1%)	3/29 (10.3%)		0.8303 (0.565-9.313)	0.25
NSTE-ACS	6/176 (3.4%)	3/198 (1.5%)		2.294 (0.565-9.313)	0.25
Unstable Angina	4/156 (2.6%)	4/119 (3.3%)		0.757 (0.185-3.089)	0.70
Stable Angina	3/146 (2.1%)	0/150 (0%)		N/A	0.95
Procedure					
Angiogram Only	10/504 (2.0%)	8/510 (1.6%)		1.270 (0.497-3.245)	0.62
PCI	5/161 (3.1%)	9/166 (5.4%)		0.559 (0.183-1.706)	0.31

Primary Composite Outcome based on guidance technique

Secondary outcomes – A. based on access site; B. based on guidance technique

	Radial (N=700)	Femoral (N=688)	Risk Ratio (95%CI)	p-value
Mean Access Time (seconds)	118.39 (141.16)	85.51 (112.96)	N/A	<0.0001
Mean Access Attempts	1.77 (1.50)	1.60 (1.17)	N/A	0.02
Procedural Time (minutes)	39.61 (25.69)	36.37 (26.21)	N/A	0.02
Dose Area Product (dGy.cm ²)	592.21 (472.73)	530.20 (652.56)	N/A	0.04
Number of First-Pass Successes	456 (66.42%)	464 (67.44%)	0.890 (0.713-1.113)	0.31
Number of Difficult Accesses	67 (9.57%)	28 (4.07%)	2.483 (1.577-3.912)	<0.0001
Venepuncture	28 (4.00%)	64 (9.30%)	0.404 (0.256-0.639)	<0.0001

Data are n (%) or mean (SD)

A

	Ultrasound (N=688)	Standard (N=700)	Risk Ratio (95%CI)	p-value
Mean Access Time (seconds)	93.10 (112.98)	111.03 (142.58)	N/A	0.01
Mean Access Attempts	1.47 (1.06)	1.90 (1.56)	N/A	<0.0001
Procedural Time (minutes)	38.01 (25.78)	38.00 (26.22)	N/A	0.99
Dose Area Product (dGy.cm ²)	555.16 (453.01)	568.27 (664.83)	N/A	0.67
Number of First-Pass Successes	503 (73.11%)	417 (59.57%)	1.822 (1.453-2.285)	<0.0001
Number of Difficult Accesses	31 (4.51%)	64 (9.14%)	0.467 (0.300-0.727)	0.0007
Venepuncture	28 (4.07%)	64 (9.14%)	0.420 (0.266-0.663)	<0.0001

Data are n (%) or mean (SD)

B

Transradial access is superior and reduces composite outcome, compared to transfemoral access, especially in diabetics, females and patients with BMI $\geq 25\text{kg/m}^2$.

US guidance increases success rates by reducing access time, attempts, number of difficult accesses, venepuncture and improving first-pass success.

- **Why?**

- Limited data comparing access site and US guidance in unselected patients, with or without ACS, referred for angiography and PCI.

- **What?**

- 1388 patients randomised to radial vs. femoral and US-guided vs. standard technique.

- **How?**

- RCT. Primary composite endpoint (ACUITY major bleeding, MACE, vascular complications) and secondary endpoints (success rates, access time, venepuncture) at 30 days.

- **What are the results?**

- Radial access significantly reduces composite outcome, especially in diabetics, females and those with BMI $\geq 25\text{kg/m}^2$. US guidance increases success rates in arterial access.

- **Why is this important?**

- All patients refer for angiography and PCI, especially diabetics, females and BMI $\geq 25\text{kg/m}^2$ should have radial access. US guidance can be used routinely to facilitate vascular access.