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Prograde SFA Access can be safe and effective for Lower Extremity Endo Procedures: When and how to do it safely


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 NYU Langone Health

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Disclosures

- Consulting/Training/Advisory Role
 - Cook
 - Gore
 - Shockwave

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Vascular Access for L.E. intervention

- **Retrograde - Cross-over** femoral artery access
 - Most commonly used access to the lower extremity from the contralateral femoral artery
 - Familiar, easy & convenient ("Comfort zone")
 - Have limitations


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Cross-over FA access: Limitations



- AAA stent-graft
- Bilateral common iliac artery stents
- Aorto-bifemoral artery bypass; Fem-femoral bypass grafts
- Steep iliac bifurcation
- Non-compliant heavily calcified access vessels



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But even in absence of anatomical or physiological limitations.....

- Antegrade SFA access can be considered arterial access in many cases
- Safe
- Fast
- Effective for tx of mid to distal SFA and BTK lesions

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Antegrade SFA Access

- First described in 1993 (25 patients and only 1 complication) Blais et al. Can Assoc Radiol J
- In 2007, Use in a "hostile groin" – 30 patients (Marcus et. al. Cardiovac Intervent Radiol 2007)


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October 2010 JVIR
Antegrade Access to the Superficial Femoral Artery with Ultrasound Guidance: Feasibility and Safety
 Andreas Gutzell, MD, Eric Schoch, MD, Thomas Sautter, MD, Regula Jenelten, MD, Nicole Graf, PhD, and Christoph A. Binkert, MD, MBA


- 100 Consecutive patients (Antegrade access with 4Fr thru 8Fr sheaths)
- 16 complications
 - 10 pseudoaneurysms (~15mm diameter)
 - 6 hematomas


Safety and Outcomes of Ipsilateral Antegrade Angioplasty for Femoropopliteal Disease
 James Cragg, MRCS¹, Danielle Lowry, MRCS¹, Jonathan Hopkins, FRCR², David Parker, BSc², Mark Kay, FRCS¹, Martin Duddy, FRCR², and Alok Tiwari, FRCSEd¹

- 556 patients underwent fem-pop angioplasty
- 461 (82%) had antegrade CFA access and these were compared to the remaining retrograde approaches


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- Antegrade CFA had less contrast and radiation ($p < .001$)
- No statistically significant difference in
 - Periprocedural complication rate
 - 15.8% Antegrade vs 11.6% Retrograde ($p = .292$)
 - Access site complication rate
 - 3.7% Antegrade vs. 1.1% Retrograde ($p = .181$)


Safety and Outcomes of Ipsilateral Antegrade Angioplasty for Femoropopliteal Disease

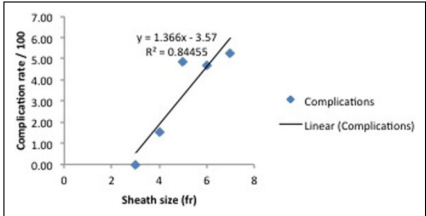




Figure 1. Complication rates for each sheath size (in French).


Antegrade vs Crossover Femoral Artery Access in the Endovascular Treatment of Isolated Below-the-Knee Lesions in Patients With Critical Limb Ischemia
 Yukun Li, MD^{1,2}, Ali Esmail, MD¹, Konstantinos P. Donas, MD^{1,2}, Georgios Pitoulias, MD^{1,2,4}, Giovanni Torsello, MD^{1,2}, Theodosios Bisdas, MD^{1,2}, Stefano Michelagnoli, MD¹, and Nicola Troisi, MD²

- 224 patients from 3 European centers
- Antegrade (mixed CFA and SFA) compared to crossover Retrograde CFA access


Antegrade vs Crossover Femoral Artery Access in the Endovascular Treatment of Isolated Below-the-Knee Lesions in Patients With Critical Limb Ischemia

- Technical Success – No difference
88% in Antegrade v 90% in Retrograde ($p > .99$)
- Access Complications – Favored Antegrade access
1.0% in Antegrade v 9.4% in Retrograde ($p = .022$)
- Sheath size – Higher complications with larger sheaths
5/6Fr 7.1% v 4fr 1.1% ($p = .047$)

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NYU Experience

Table 1. Demographics, Outpatient Intrafemoral Peripheral Vascular Interventions

	Overall (n=814)	Antegrade SFA (n=478)	Retrograde CFA (n=336)	P Value
Age at Procedure, mean ± SD (yrs)	70.2 ± 11.8	70.2 ± 11.8	70.2 ± 10.9	0.47
Male Gender % (n)	51.2% (415)	56.5% (276)	51.7% (181)	0.24
Race				
Asian	2.1% (17)	1.7% (8)	2.7% (9)	
Black / African American	14.7% (120)	14.9% (71)	14.5% (49)	
Native American / Alaskan Native	0.0% (0)	0.0% (0)	0.0% (0)	
Native Hawaiian / Pacific Islander	0% (0)	0% (0)	0% (0)	
White	76.6% (622)	71.2% (341)	80.4% (281)	
Unknown	12.1% (102)	13.9% (67)	13.4% (47)	
BMI, mean ± SD	26.9 ± 5.4	26.8 ± 5.4	26.7 ± 5.4	0.83
Fast Medical History, % (n)				
CAD	14.4% (118)	14.9% (69)	13.8% (46)	0.72
COPD	12.0% (98)	14.6% (69)	8.4% (28)	0.01
CHF	9.7% (79)	10% (48)	8.2% (27)	0.70
Diabetes	13.4% (109)	17.2% (77)	6.6% (22)	0.01
ESRD	0.7% (7)	1.4% (6)	1.5% (5)	<0.001
Smoking History	29.1% (238)	37.3% (181)	16.2% (53)	<0.001
Fast Surgical History, % (n)				
CKABG	17.3% (141)	17.3% (81)	17.3% (58)	0.97
PCI	20.6% (168)	18.0% (85)	23.2% (77)	0.11
PTI	14.3% (116)	17.3% (79)	10.6% (35)	0.02
Liver Extremity Bypass	10.9% (89)	13.0% (61)	7.4% (25)	0.002
Amblyopia	0.5% (7)	10.0% (48)	8.9% (30)	0.04
Epistaxis Anemiasis	1.6% (13)	2.9% (14)	1.0% (3)	0.04
Prophylactic Medication, % (n)				
Aspirin	42.4% (345)	43.3% (204)	41.1% (136)	0.32
Cholesterol	19.2% (156)	16.6% (78)	16.7% (55)	0.40
Beta-blocker	26.7% (218)	24.0% (113)	30.4% (101)	0.04
Statins	43.7% (355)	45.0% (214)	39.5% (131)	0.10
Antiarrhythmia	10.4% (84)	10.2% (48)	11.3% (38)	0.42

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Table 3. Complications by Access Type, Outpatient Intrafemoral Peripheral Vascular Interventions

	Overall (n=814)	Antegrade SFA (n=478)	Retrograde CFA (n=336)	P Value
Any Complication, % (n)	2.3% (17)	1.8% (8)	3.0% (10)	0.32
Hematomas	0.2% (2)	0.9% (4)	1.3% (4)	0.09
Access site occlusion	0.1% (1)	0% (0)	0.3% (1)	0.41
Arterial Perforation	0.2% (2)	0.2% (1)	0.3% (1)	0.34
Arterial Dissection	1.1% (9)	0.7% (3)	1.7% (5)	0.28
AV Fistula	0% (0)	0% (0)	0% (0)	---

Antegrade SFA 1.8% vs. Retrograde CFA 3.0% (p=.32)

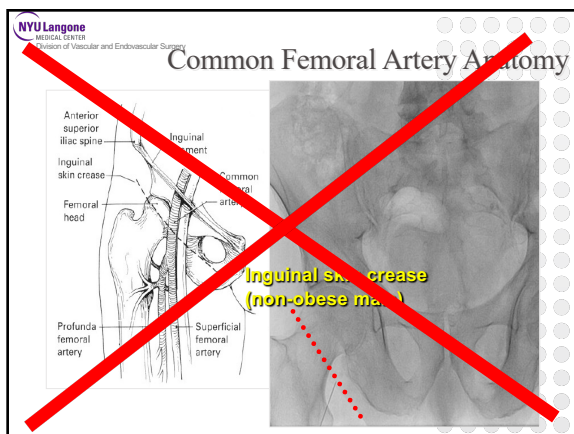
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Access Complication Rate Increased with Sheath Size

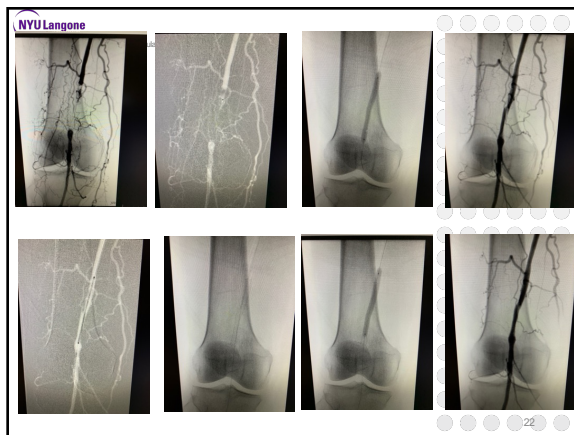
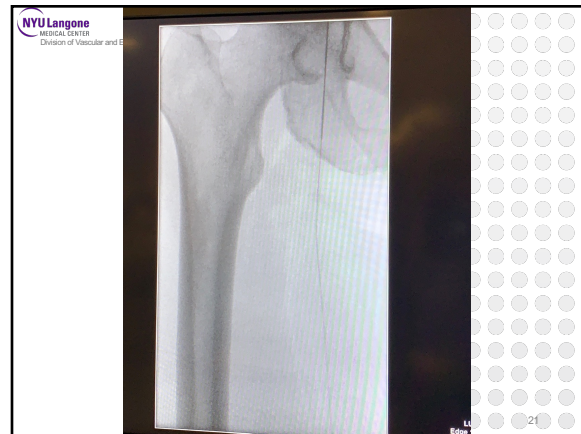
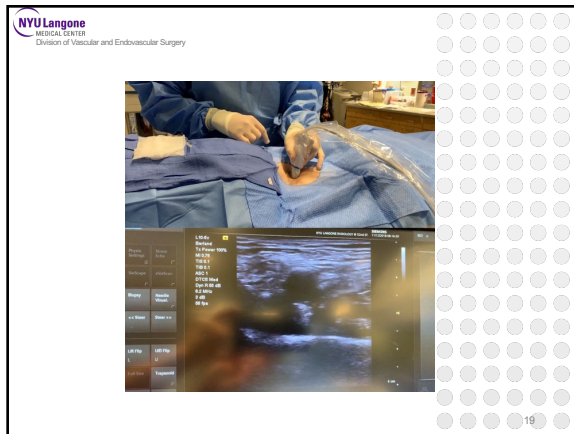
Table 4. Complications by Sheath Size

	4 French (n=416)	5-6 French (n=297)	P Value
Any Complications, % (n)	1.6% (6)	3.1% (11)	0.22
Access Hematoma	1.0% (4)	1.3% (4)	0.90
Access Stenosis/Occlusion	0% (0)	0.3% (1)	0.49
Arterial Perforation	0.3% (1)	0.3% (1)	0.37
Arterial Dissection	0.3% (1)	2.0% (7)	0.03
AV Fistula	0% (0)	0% (0)	---

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- ### Updated Experience at NYU - 2023
- 1710 Antegrade SFA access procedures
 - 4Fr sheaths
 - 7 (0.4%) pseudoaneurysms requiring thrombin injection



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- ### Our Technique
- Always stand on patients left with Image Intensifier on pts right (regardless of leg being treated)
 - U/S is a must
 - Micropuncture technique
 - 4fr Sheath
-



Available Devices

- Balloons
 - Numerous manufacturers
- Stents
 - Biotronik
- Atherectomy devices
 - CSI and Laser
- Lower profile sheaths can allow even larger devices!
 - Slender 4/5

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Conclusion

- 4Fr Antegrade SFA access is:
 - Fast
 - Effective
 - Safe (low complication rate)

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Thank You

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