Retrograde access through the distal superficial femoral artery for complex SFA occlusions

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Purpose: To present our experience with a rarely used technique for retrograde recanalization of chronic total occlusions (CTOs) of superficial femoral artery (SFA) in cases of failed standard antegrade approach.

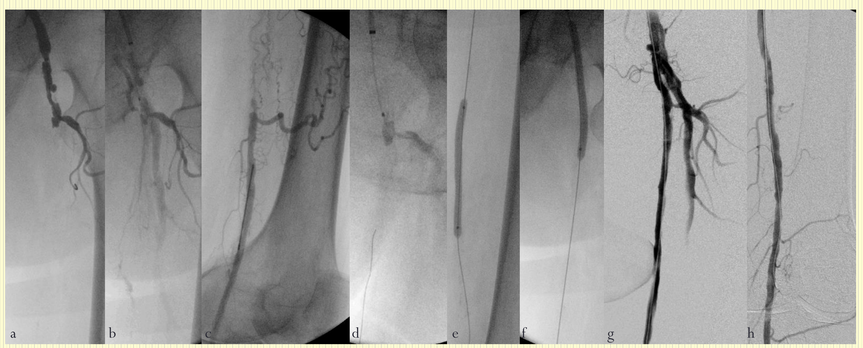
Material and methods: We conducted a retrospective study of 13 patients (10 men, mean age 76 years in the period 04.2015-03.2018), who following an unsuccessful attempt of antegrade recanalization of chronic SFA occlusions, at the discretion of the operator, underwent a one-stage retrograde recanalization with access via distal SFA / proximal popliteal artery(PA).

Patient and lesion characteristics

Age	76 +/-9.5	*Clinical status*	
Men	10 (77%)	Rutherford class 3	3 (23%)
Risk factors		Rutherford class 4	1 (8%)
Diabetes	9 (69%)	Rutherford class 5	9 (69%)
Hypertension	11 (85%)	*Lesion length*	179+/-46mm
Coronary artery disease	9 (69%)	*TASC*	
Chronic renal failure	4 (31%)	C	4 (31%)
Smoking	7 (54%)	D	9 (69%)
Dyslipidemia	4 (31%)		

Causes of failure in antegrade recanalization were:
- inability to re-enter the distal true lumen- 10 cases
- perforation of the artery - 2
- inability to prograde with the wire - 1.

Technique: In the presence of an accessible patent distal SFA, a puncture of the latter was performed in the same supine position with the limb slightly flexed in the knee and rotated laterally. Under angiographic control the artery was punctured with a 21G needle, followed by the introduction of a 0.018 " guidewire. In some cases 4F introducer was inserted and in the rest recanalization was performed only with the support of a microcatheter (sheathless approach). Upon successful wiring of the occlusion, the guide was externalized through the proximal access sheath and angioplasty with or without stenting was performed from above.



a). Total occlusion of the left SFA. b). Perforation after antegrade attempt. c). Retrograde puncture of the distal SFA with a 21-G needle just bellow the distal cup. d). 0.018" wire inserted and supported by a microcatheter. e),f). PTA from above after externalization of the wire through the sheath in the CFA. g),h). Final result.

Results: The distal SFA puncture was successful in all patients. Sheathless approach was used in 11 cases (85%) and 4F sheath was placed in 2 (15%). Recanalization was successful in 12 of 13 patients (92%). In 10 of them (83%), angioplasty was followed by stenting. Hemostasis at the distal access was achieved with manual compression for 3-5 min in the cath lab. The only complication was a limited hematoma at the distal puncture side in one patient.

Discussion: SFA CTOs remain challenging with only 75% success rate with standard antegrade approach(1). In cases of failure re-entry devices or additional retrograde access (popliteal, tibial, distal SFA) can solve the problem.
The technique we used is well described by Schmidt(2) and has the advantage to be performed in supine position, thus giving more opportunities for recanalization (use of SAFARI, double balloon tech.). We used angiographic guidance, but puncture under ultrasound control is also possible. We had no major access side complications, probably because of the sheathless approach, used in most of the cases.

Conclusion: Our study confirms that distal SFA retrograde access is safe and effective in recanalization of difficult SFA total occlusions

1. Scheinert D, Laird JR, Schröder M, et al. Excimer laser-assisted recanalization of long, chronic superficial femoral artery occlusions. J Endovasc Ther 2001; 8: 156-66
2. Schmidt A, Bausback Y, Piorkowski M, et al. Retrograde Recanalization Technique for Use After Failed Antegrade Angioplasty in Chronic Femoral Artery Occlusions. J Endovasc Ther 2012; 19: 23-29