

# A. poplitea: Was geht, was nicht?



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Passau

 **GEFÄSSZENTRUM**  
Passau

zertifiziert durch

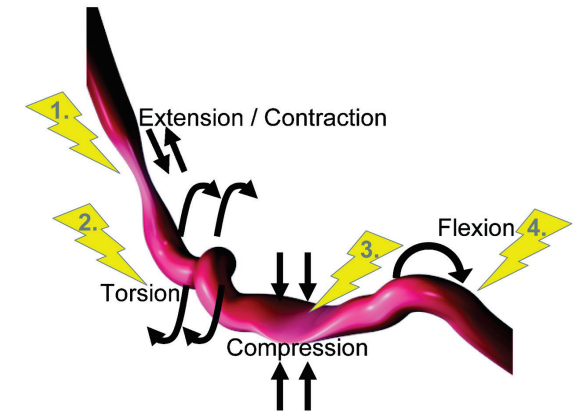
Deutsche  
Röntgengesellschaft



  
Deutsche Gesellschaft  
für Gefäßchirurgie

# Besonderheiten der A. poplitea

- Bewegungssegment
- Winkelbeugung
- Torsion
- Stauchung
- Kompression
- ...
- Anschluss für Bypass!



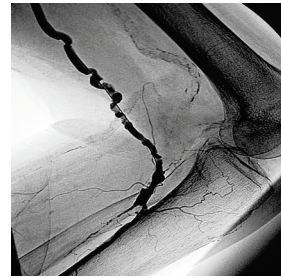
# Besonderheiten der A. poplitea

# Wenig Literatur!





# A. Poplitea ...



- **Akut**
  - Aspiration
  - Lyse
  - mechan. Rekanalisation
  - Graft
- **Stents**
  - Nitinol?
  - Ballonmontiert?
  - Helikale Stents
  - Endograft
- **Chronisch**
  - (Lyse)
  - Rekanalisation
  - PTA (plein, DEB)
  - Stents (Metall/Graft)
- **Aneurysma**
  - Embolisierend
  - Lyse
  - Rupturgefahr
  - Endograft



# Antegrade Rekanalisation

## intraluminal

- Führungsdrähte/Katheter
- Oszillierende Rekanalisation (z.B. Crosser)

## extraluminal

- Subintimale Rekanalisation mit dem Draht (Bolia-Technik)
- Subintimale Rekanalisation mit Re-Entry System (z.B. Outback, Pioneer Plus Catheter)

# Crosser



- 6F Device (Führkatheter optional)
- 20kHz Generator, Schwingungen
- Katheterspitze Titan
- Sprühnebel, NaCL 14 bar
- 0.014" Führungsdraht, Rx oder OTW

# Crosser: Ergebnisse

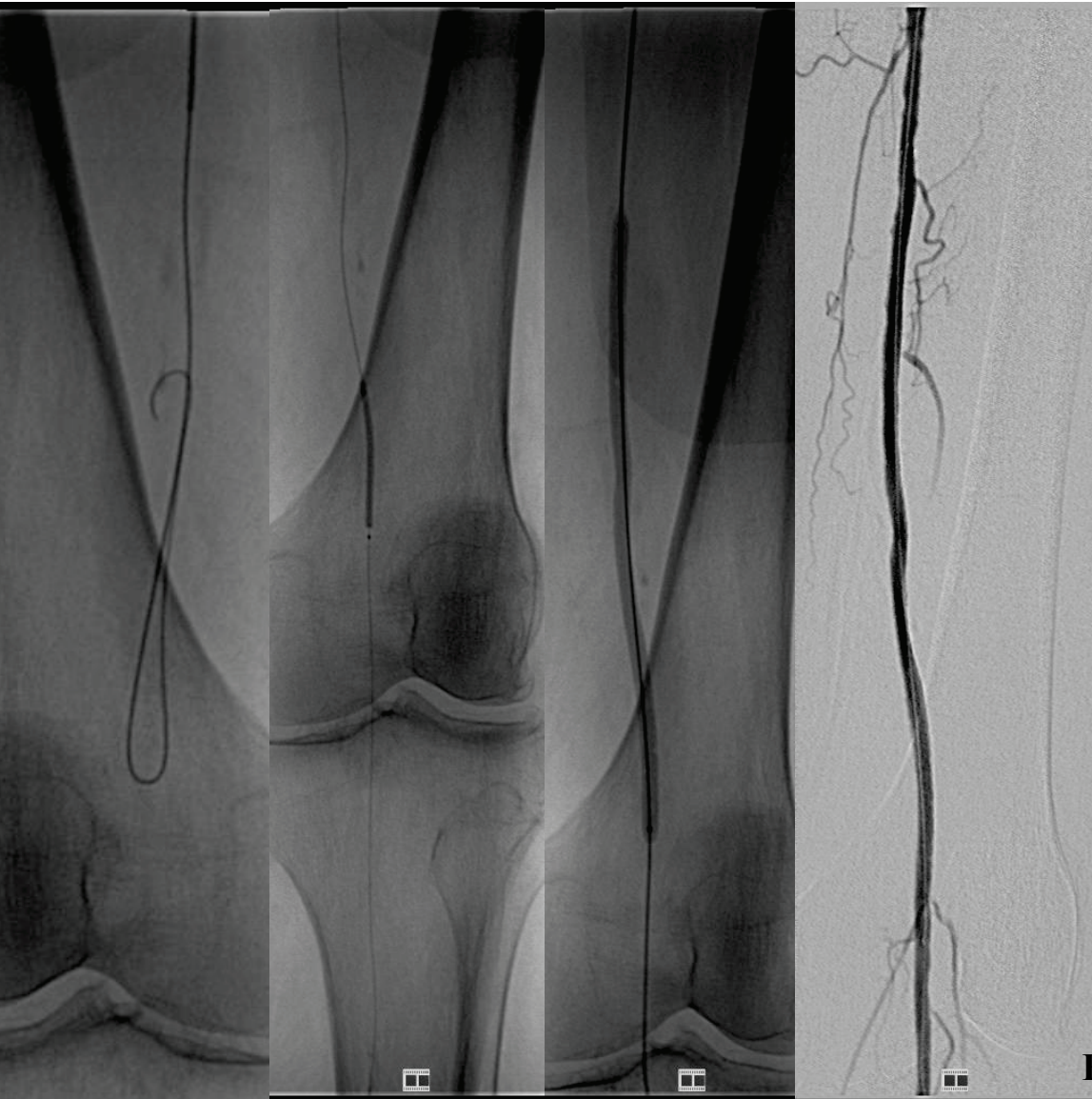
56 Patienten

iliakal und fem-pop

Techn. Erfolg	prim.	sekund.
gesamt	76.7%	87.7%
davon aortoiliakal		90%
davon tibial		95.2%

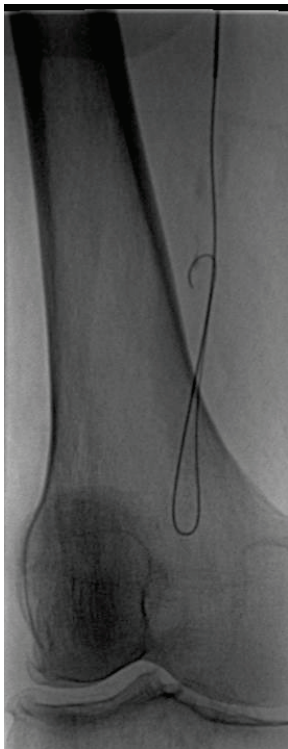


# Subintimale Rekanalisation (Bolia-Technik)



- gezielte subintimale Sondierung entlang der Okklusion durch FD (loop)
- Re-entry auf Höhe distal. Lumen
- PTA, ggf. Stent/Endograft des neuen Lumens

# Subintimale Rekanalisation: Langzeitergebnisse

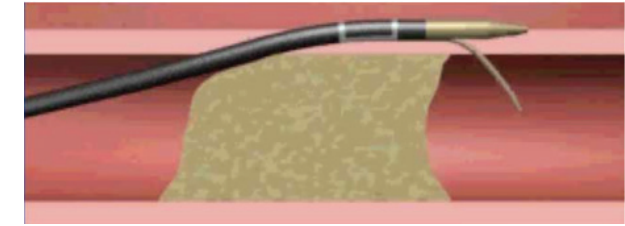


- 200 fem-pop Verschlüsse
- mittl. Länge 11cm (2-37)
- prim. Erfolg 80%
- ABI 0.6 → 0.9

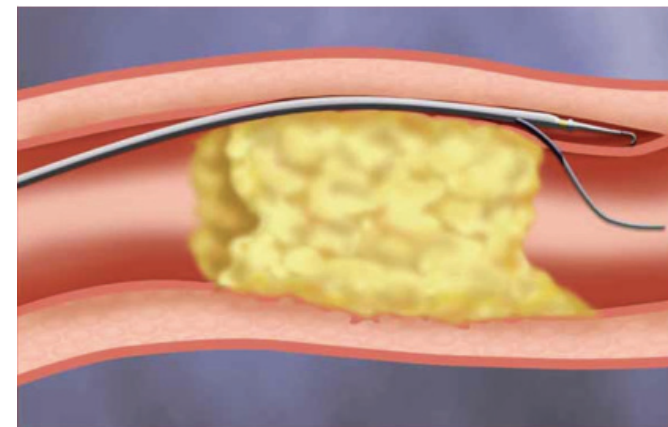
Offenheit	1 Jahr	3 Jahre
	71% (73%)	58% (61%)

pos. prädiktive Faktoren: Anzahl US Gefäße ↑, Verschlusslänge ↓

# Outback



- 6F Katheter
- 22G Hohlneedle
- Navigation durch 2 Ebenen + Marker
- 0.014" Führungsdraht OTW





# Outback

PAVK IIb

Keine Passage mit  
Führungsdraht

Antegrad mit Crosser



# Outback

PAVK IIb

Keine Passage mit  
Führungsdraht

Antegrad mit Crosser

Kein Re-entry X

Perforation





# Outback

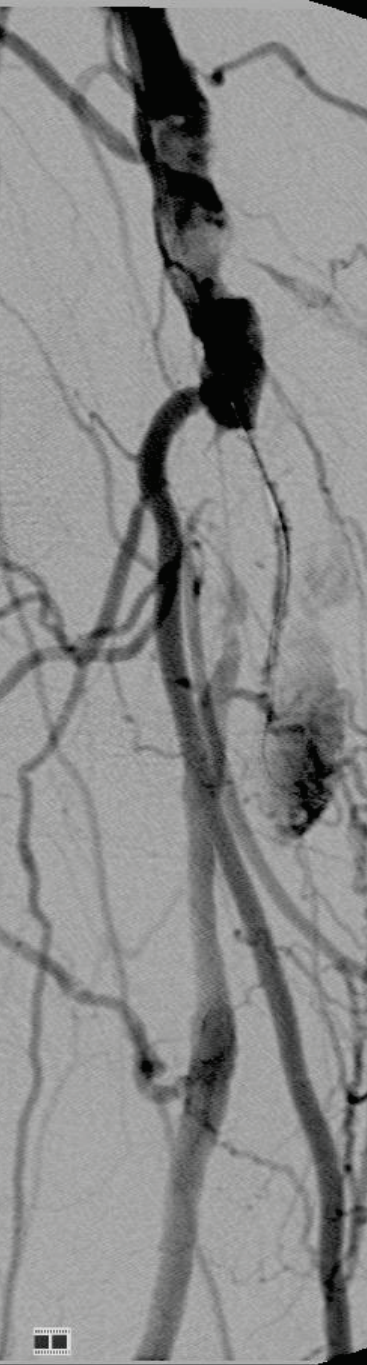
PAVK IIb

Keine Passage mit  
Führungsdraht

Antegrad mit Crosser

Kein Re-entry X

Perforation





# Outback

PAVK IIb

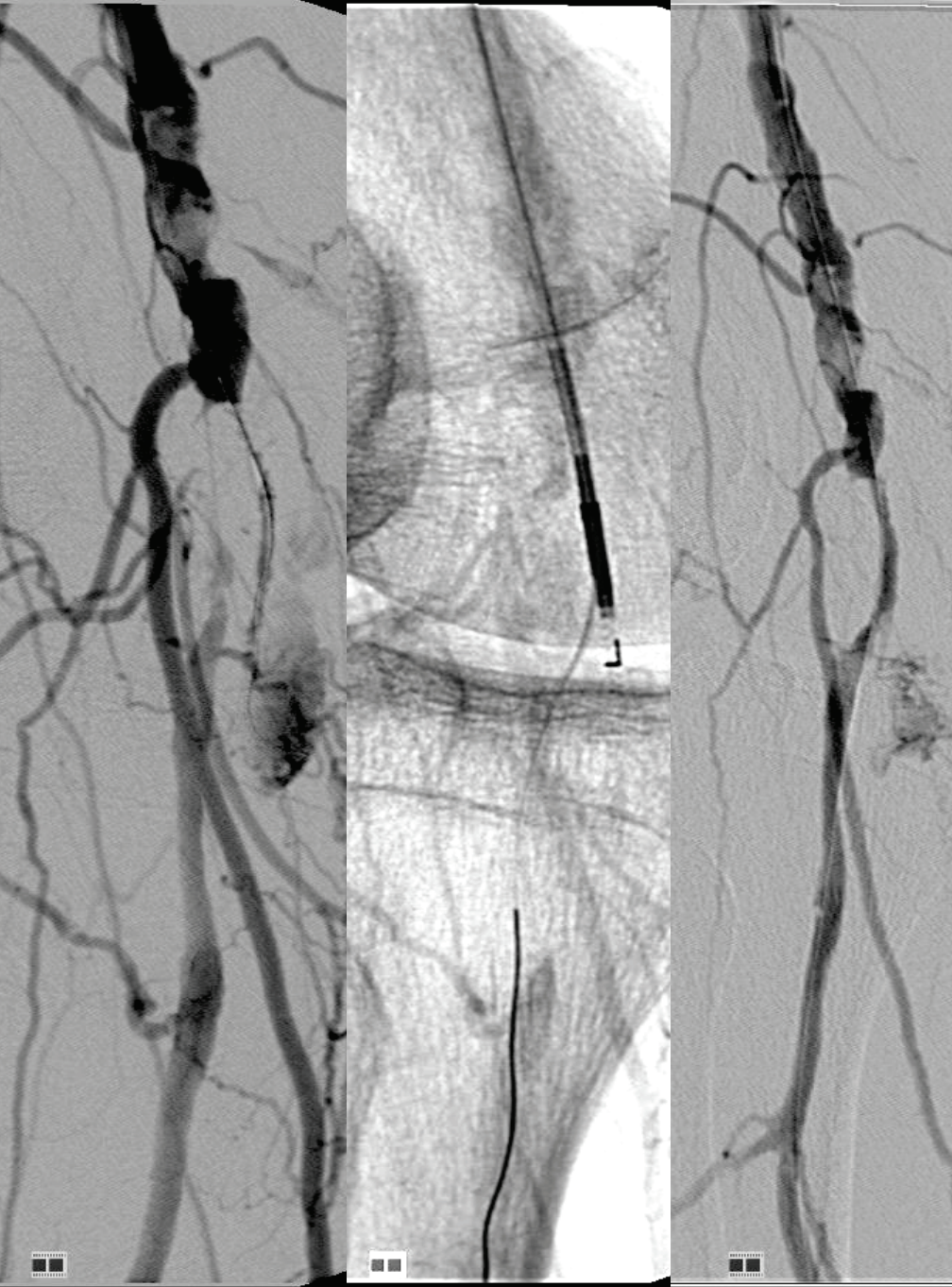
Keine Passage mit  
Führungsdraht

Antegrad mit Crosser

Kein Re-entry ✗

Perforation

Re-entry mit Outback ✓





# Outback

PAVK IIb

Keine Passage mit  
Führungsdraht

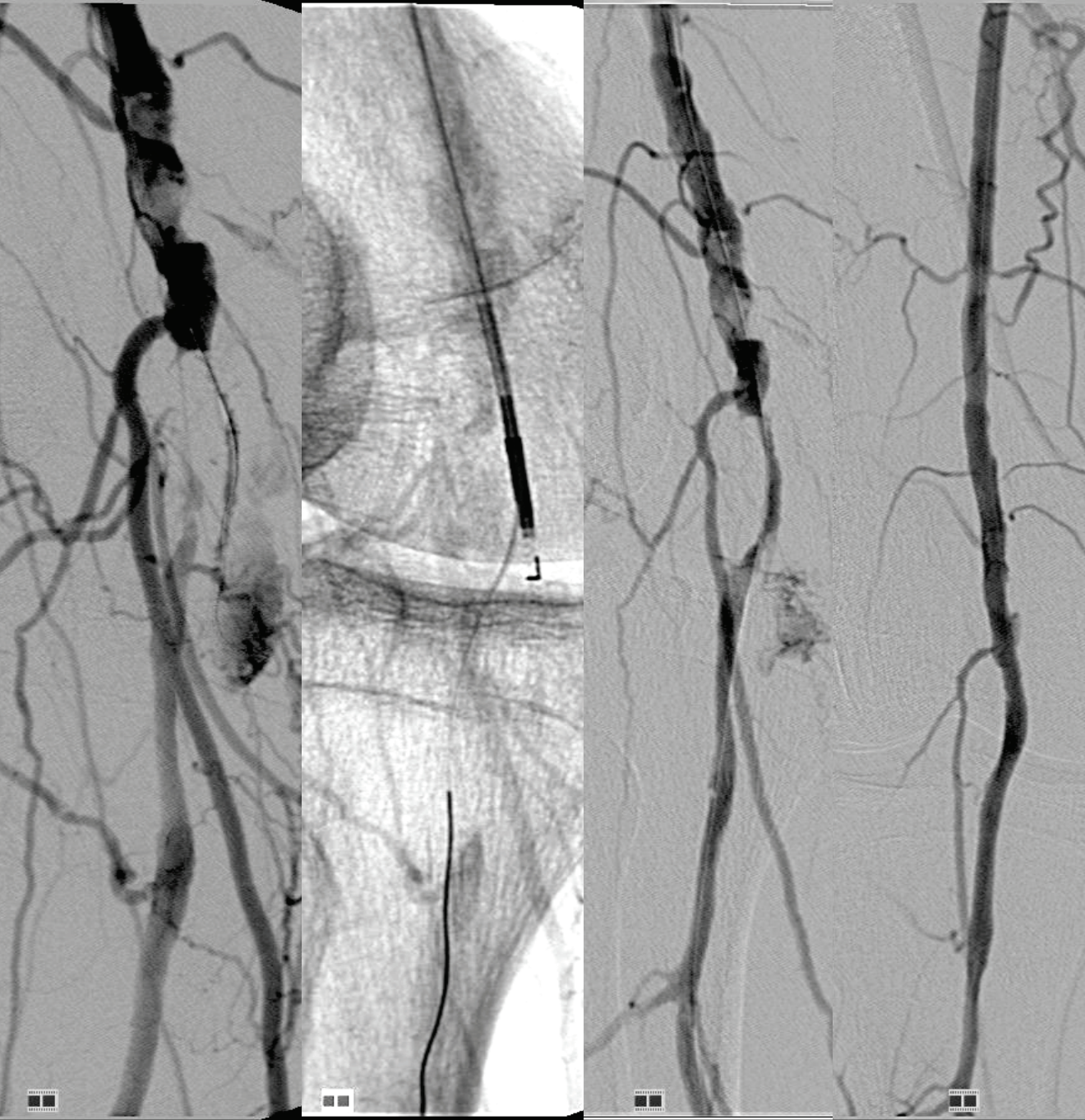
Antegrad mit Crosser

Kein Re-entry ✗

Perforation

Re-entry mit Outback ✓

Supera Stent



# Outback: Ergebnisse

113 Patienten, 118 Extremitäten

fem-pop, chron. Okklusionen

Claudicatio 67.8%

CLI 32.2%

<b>Re-entry</b>	<b>91.5%</b>
Komplikationen	Blutung 4.2%
Offenheit 12 Monate	Prim. 56.7%
	Prim. Ass. 83.1%
	Sek. Ass. 89.1%

...und wenn alles nichts hilft:  
retrograd?

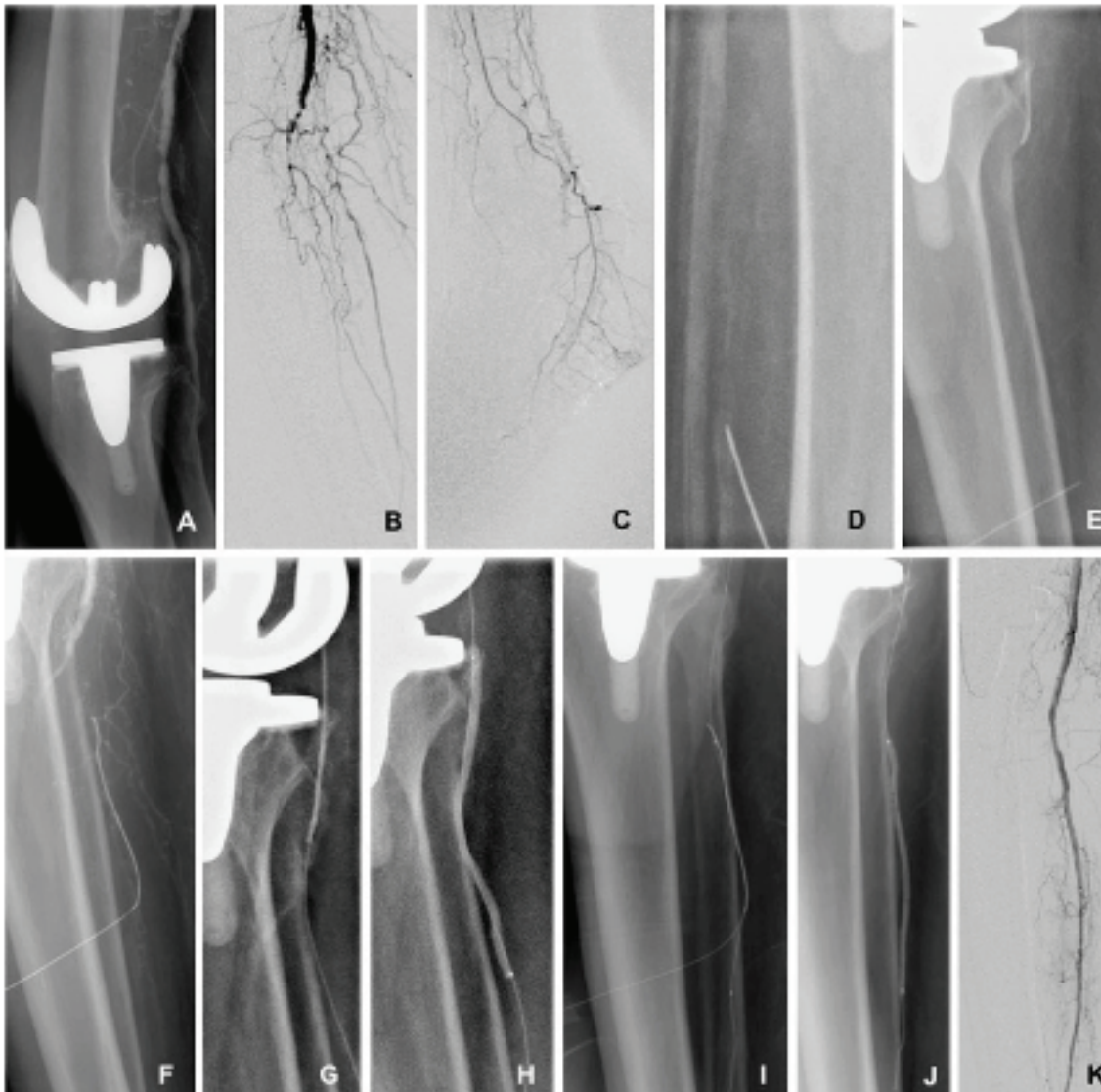
# SAFARI

subintimal arterial flossing with  
antegrade-retrograde intervention

Keine antefrade Passage  
mit Führungsdraht

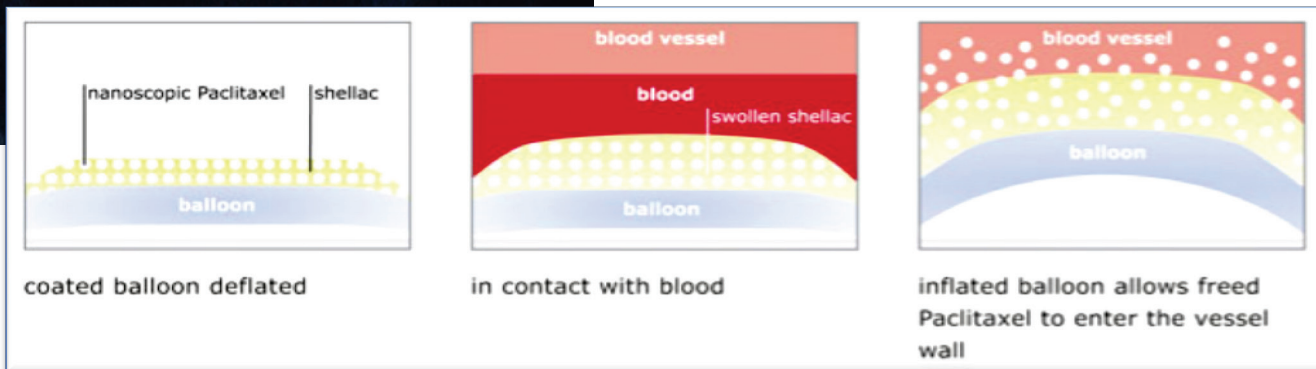
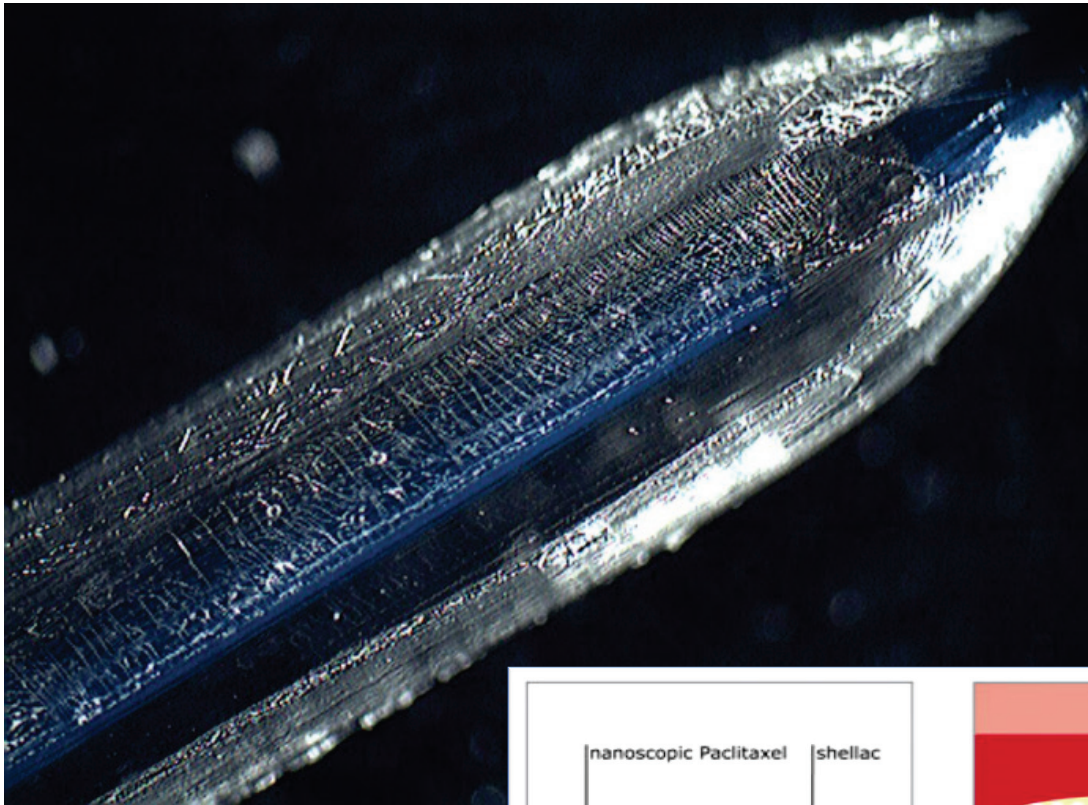
Retrograd 0.018" V-18  
3/100 mm PTA

Antegrade PTA  
Punktionsstelle

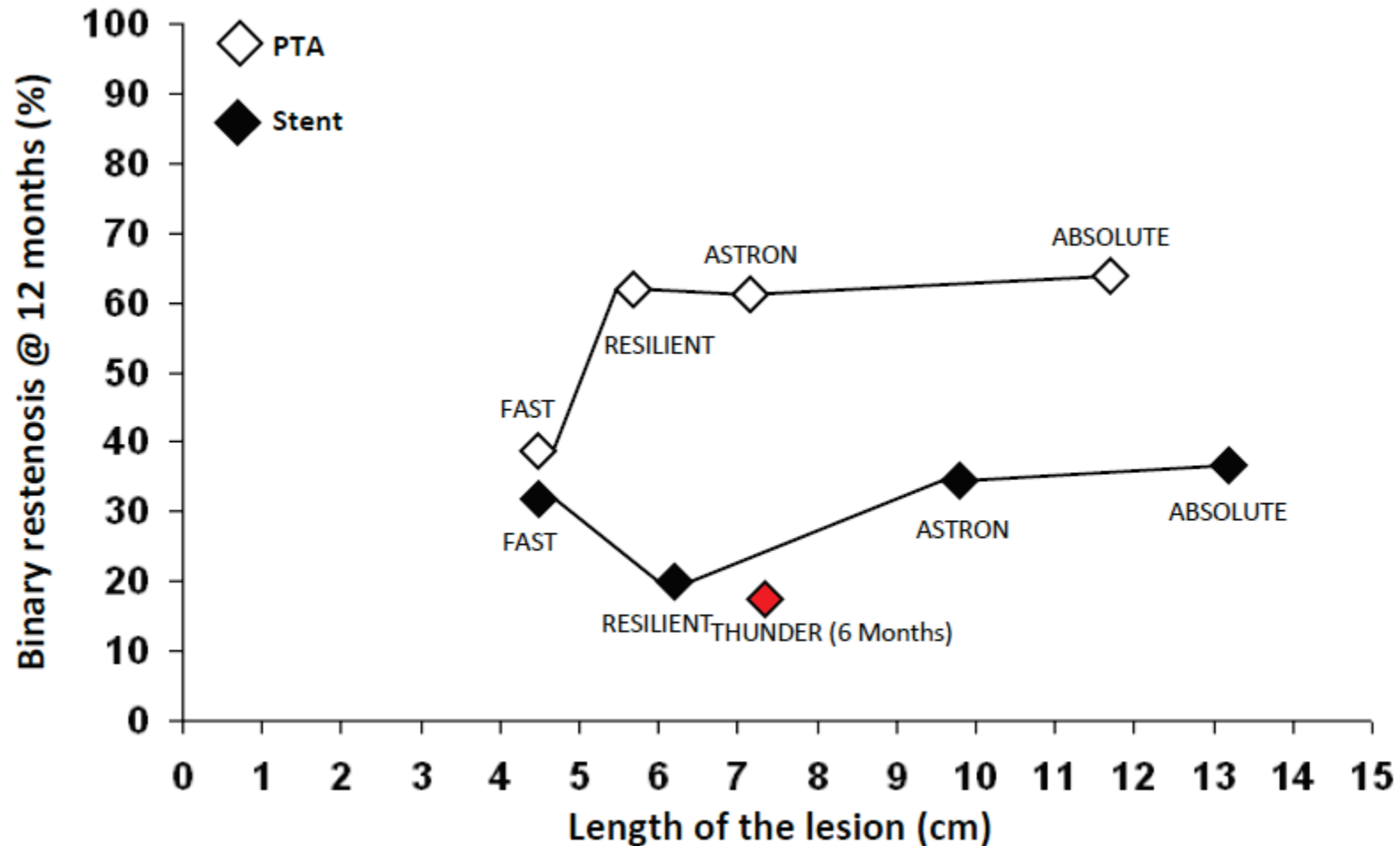




# Paclitaxel beschichtete Ballons



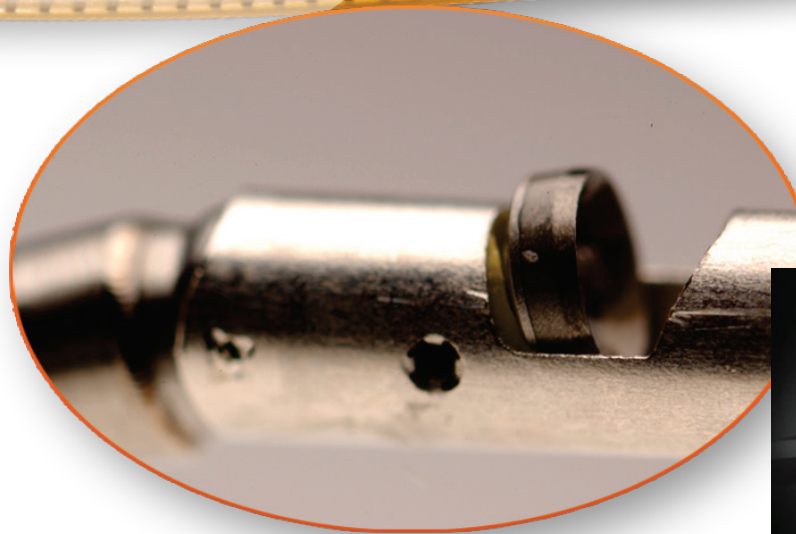
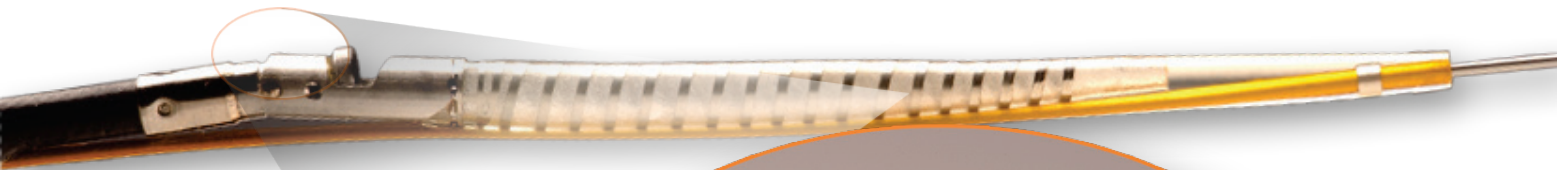
# Re-Stenose: rand. Studien - 12 Monate



# new indications

	<b>Indication</b>	<b>Name</b>
<b>Medrad</b>	In-stent RS SFA BTK BTK Atherectomy (+EV3)	COPA COBANA (0/70) 6 mo DSA Euro Canal US Canal Definitve AR (0/100) 12 mo LLL
<b>Eurocor</b>	+ Stent In-stent RS SFA In-stent RS BTK BTK Shunt stenosis	Freeway Stent Study (11/200) PACUBA in discussion in discussion in discussion
<b>Medtronic Invatec</b>	In-stent RS SFA BTK Shunt	FAIR (23/118) 6 mo DUS In Pact Deep (100/357) 12 Mo DSA + clinical Impact Shunt (0/136) 6 mo LLL
<b>Aachen Resonance COOK Lutonix Biotronik</b>	in stent restenosis? - - -	- - - -

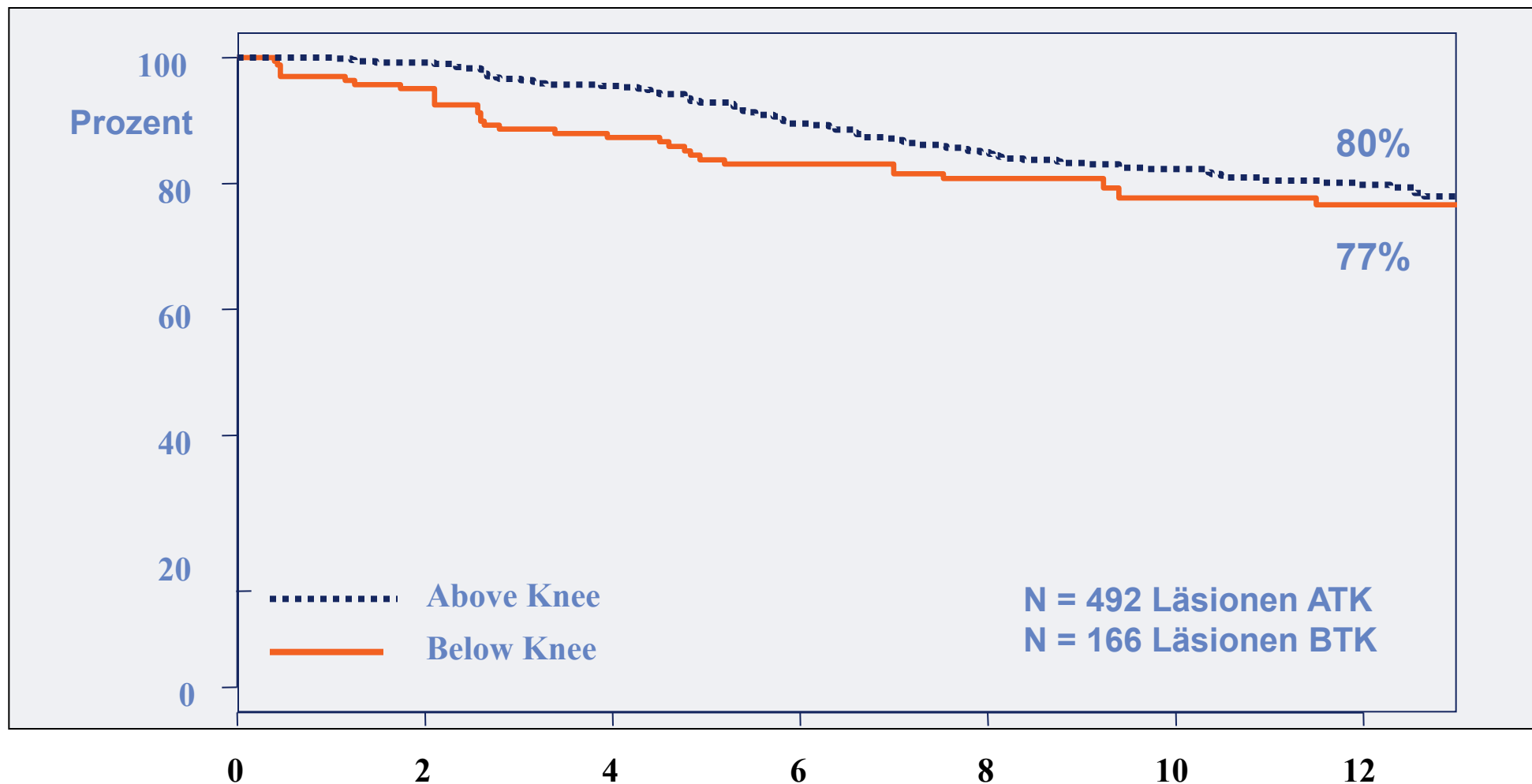
# Atherektomie



Silverhawk Catheter

Turbohawk Catheter

# 12-month Freedom of TLR: ATK vs. BTK



	0	2	4	6	8	10	12
Below Knee :	(100)	(95)	(87)	(83)	(81)	(78)	(77)
Above Knee :	(100)	(99)	(95)	(90)	(85)	(82)	(80)



# Atherektomie

56 Patienten mit CLI

77 CLI



	Atherektomie (n=18)	Angioplastie (n=38)
Reststenose < 30%	94%	71%
Dissektionen	0%	23%
Embolie	22%	0%
Prim. Patency 3M	94%	89%
Prim. Patency 6M	88%	82%
Prim. Patency 12M	75%	73%

# Silverhawk

PAVK IV

eGFR < 45

7F Schleuse

7F Silverhawk

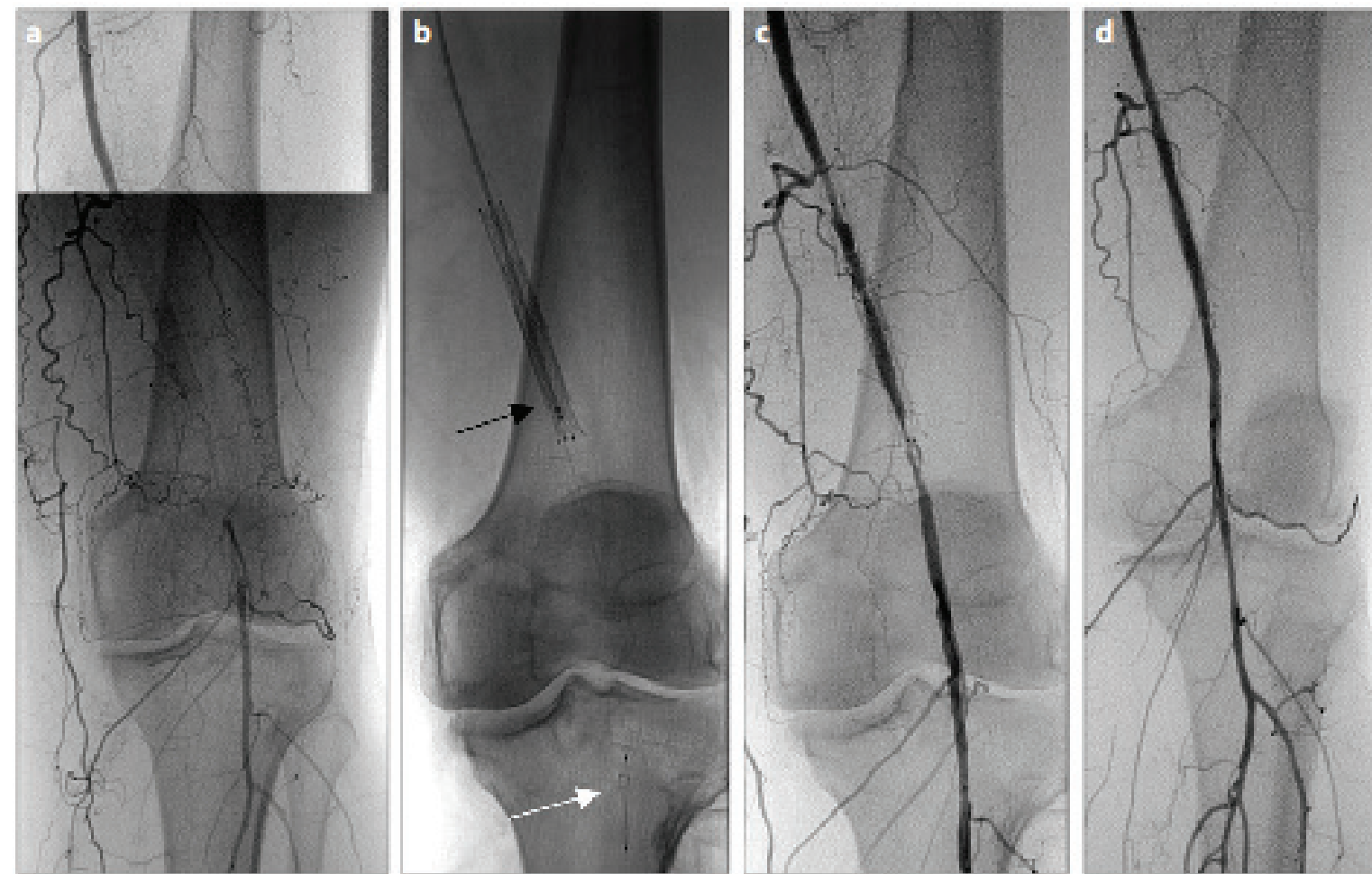


# Mechan. Thrombektomiekatheter

	ThromCat	Angiojet	Rotarex	Apirex
Katheterdesign	RX	OTW	OTW	OTW
Katheterlänge	150	135	80/110	80/110
Durchmesser	6F	4/5F	6F	6F
Zielgefäß	2.5-7	2-8	3-5	3-5
Spülfluss (ml/s)	38	50-60	45	45
Komplikationen	≤20% distale Embolsation	≤10% distale Embolsation Endothelschäden	≤24% distale Embolsation ≤8% Perforation	Nicht bekannt

nach:

**Deák et al.** Rotational thrombectomy of acute peripheral vascular occlusions using the ThromCat XT device: techniques, indications and clinical resulty. **Diagn Inter Radiol 2011; 17:183-289**



10 Pat.  
Rutherford 4-5

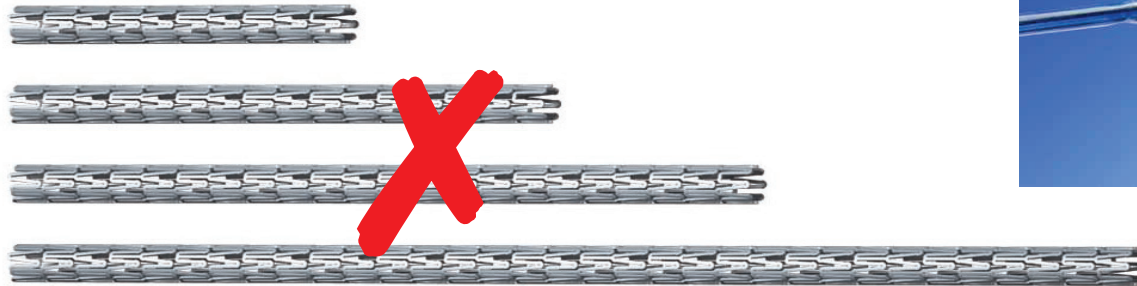
2/3 A. pop. ThromCat  
erfolgreich rekanalisiert

bei organisiertem  
Thrombus erfolglos



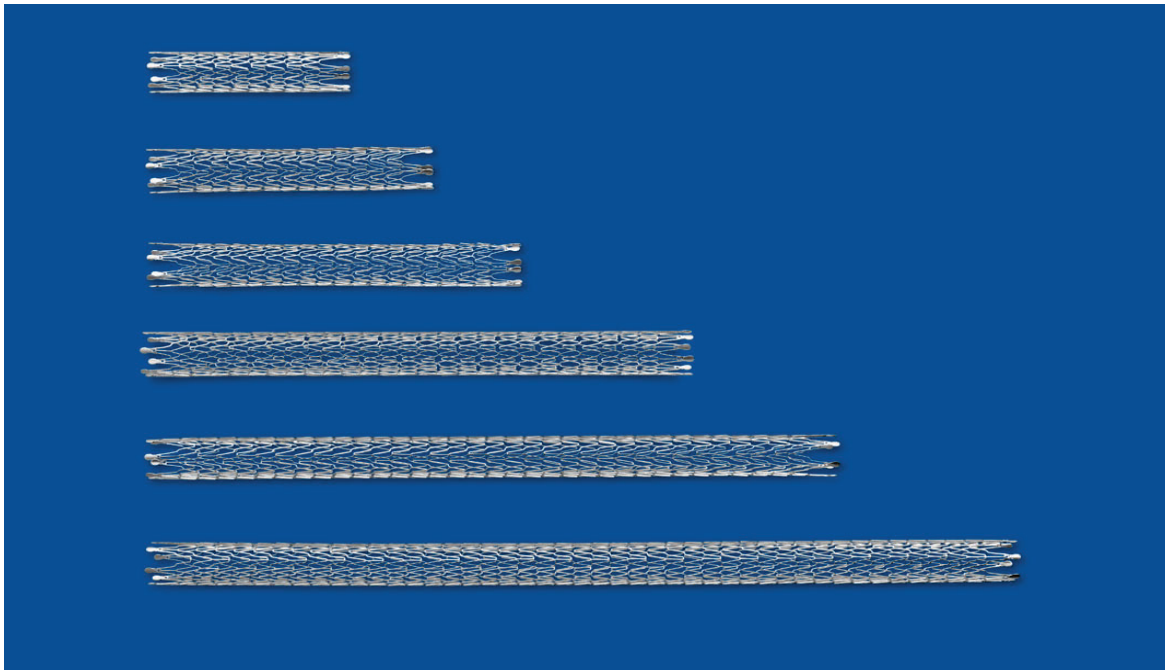
# Ballonmontierte Stent

- „bail out“
- ansonsten vermeiden

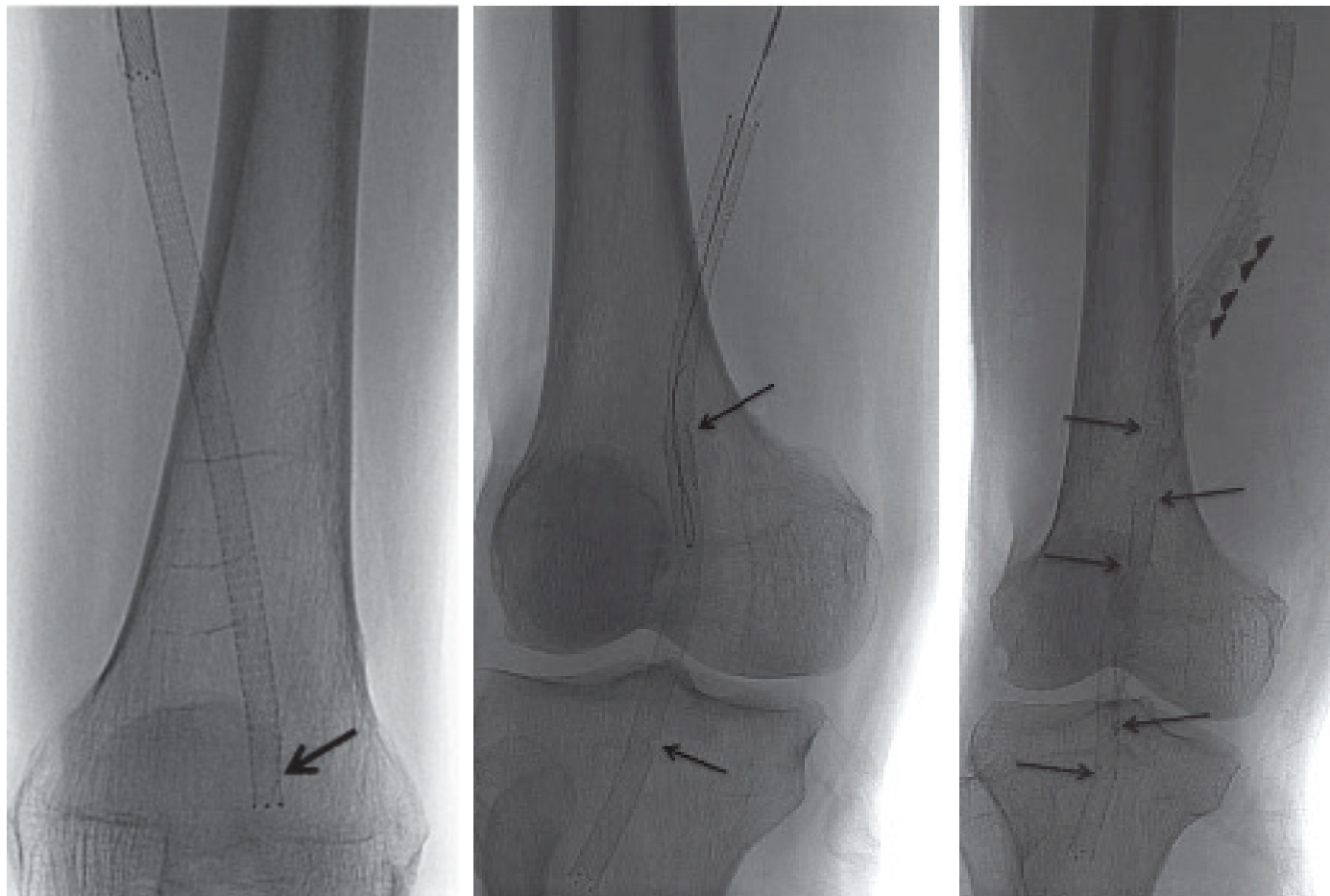


# Nitinolstents

- nicht über gesamte A. poplitea
- „bail out“
- so kurz wie möglich
- Frakturgefahr!



# Nitinolstents in A. poplitea



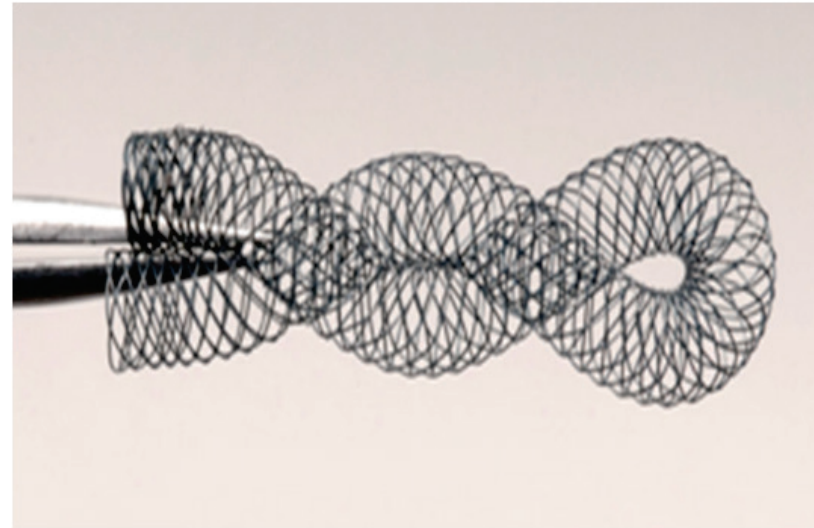
18 Pat.  
TASC IID

6 mm Nitinol Stents  
(SMART)

1 Jahr FU

10/18 Stentfrakturen  
11/18 Okklusionen

# Supera



- 6F Schaft
- helikaler Nitinolstent
- hohe radiale Aufstellkraft
- flexibel, knickt nicht
- in gleichem Durchmesser wie Gefäß

IDEV



# Supera

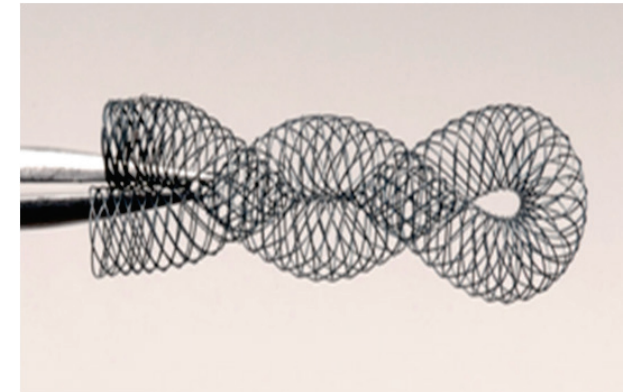
40 Patienten mit CLI

Rutherford 3 (n=10)

Rutherford 4/5 (n=30)

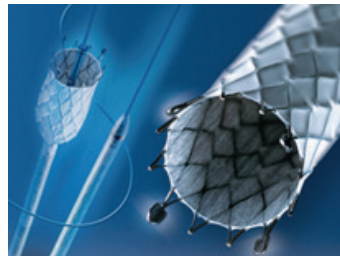
FU 15.9 Mo

ABI 0.37 -> 0.91



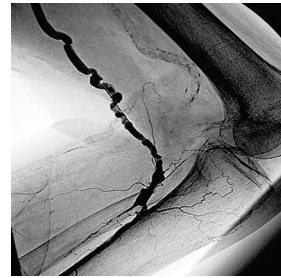
Techn. Erfolg	prim.	sekund.
Offenheit	68.4%	79.8%

# Endografts



- nur flexible verwenden!
- nur Daten über Propaten-  
beschichtete Viabahn
- Aneurysmata
- Perforation
- bei Stenosen?
- „bail out“

# A. Poplitea ...



- **Akut**
  - Aspiration
  - Lyse
  - mechan. Rekanalisation
  - Graft
- **Stents**
  - Nitinol?
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  - Helikale Stents
  - Endograft
- **Chronisch**
  - (Lyse)
  - Rekanalisation
  - PTA (plein, DEB)
  - Stents (Metall/Graft)
- **Aneurysma**
  - Embolisierend
  - Lyse
  - Rupturgefahr
  - Endograft

(sub-) akute Verschlüsse



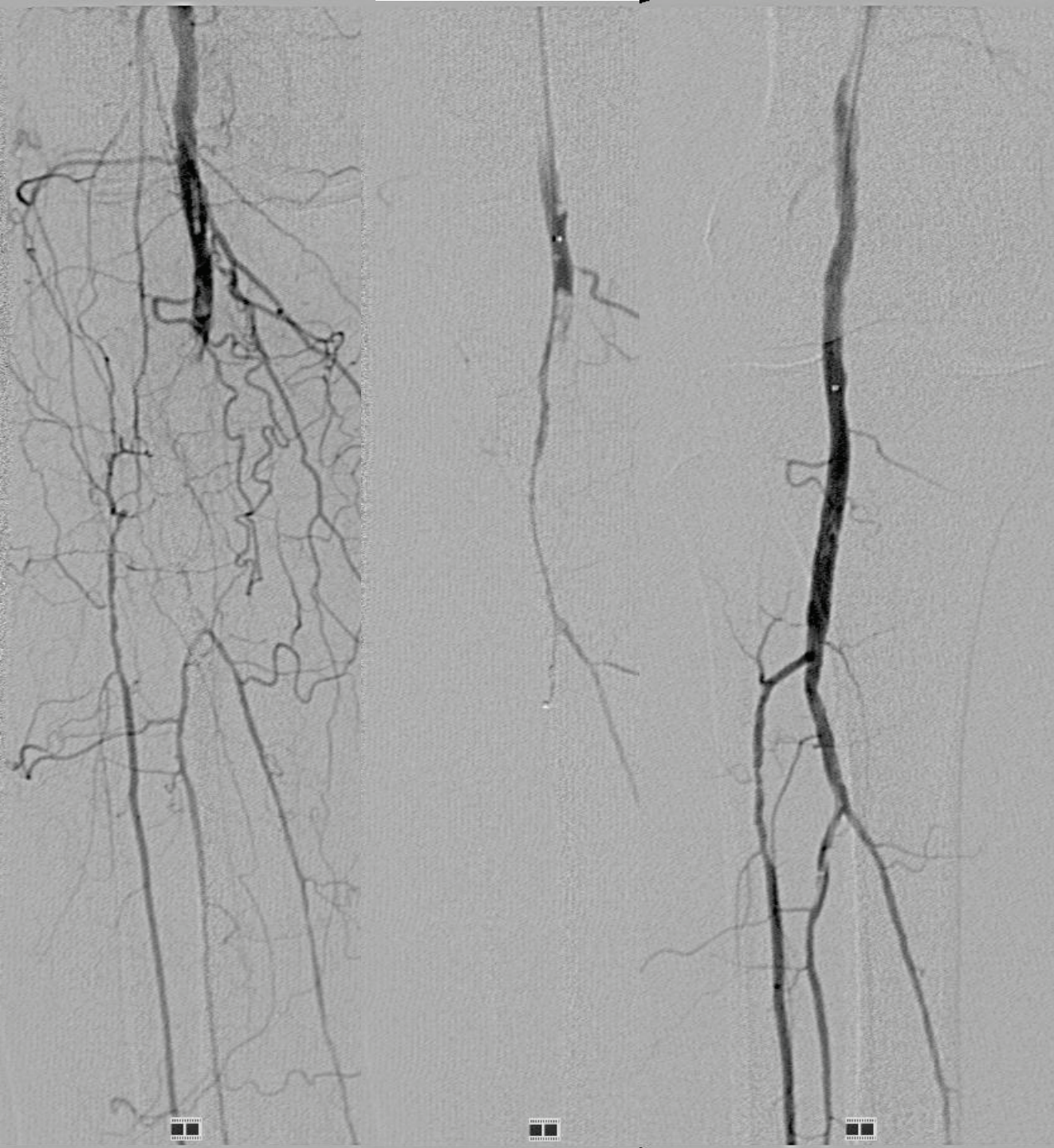
# Lyse

VHF, subakute Ischämie

Cross-over Zugang

4F Lysekatheter

10 mg rTPA/12h





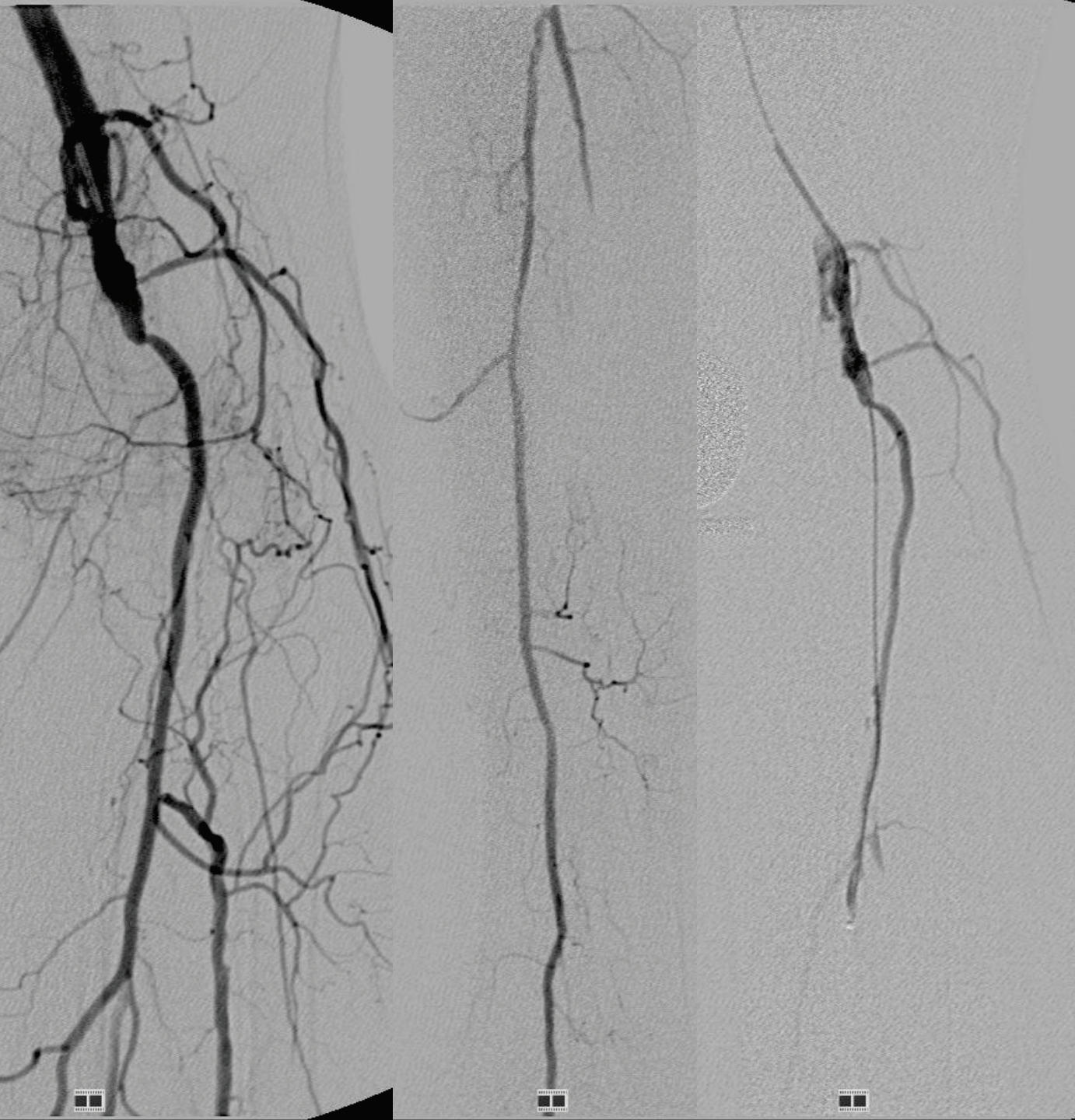
# Lyse & Nitinolstent

PAVK IIb

Antegrader Zugang, 6F

4F Lysekatheter

10 mg rTPA/12h



# Lyse & Nitinolstent

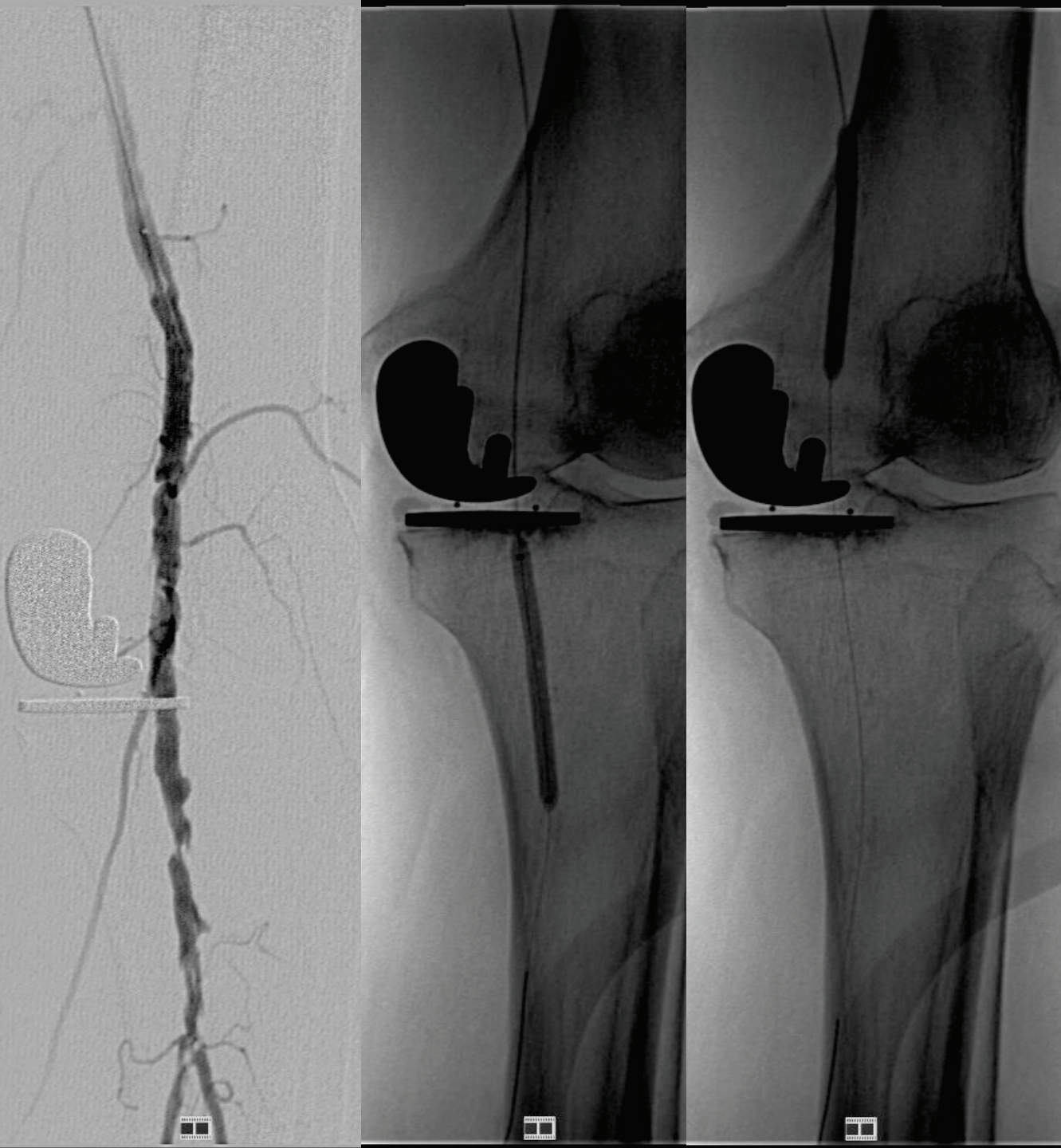
PAVK IIb

Antegrader Zugang, 6F

4F Lysekatheter

10 mg rTPA/12h

PTA 5/60 mm





# Lyse & Nitinolstent

PAVK IIb  
Antegrader Zugang, 6F

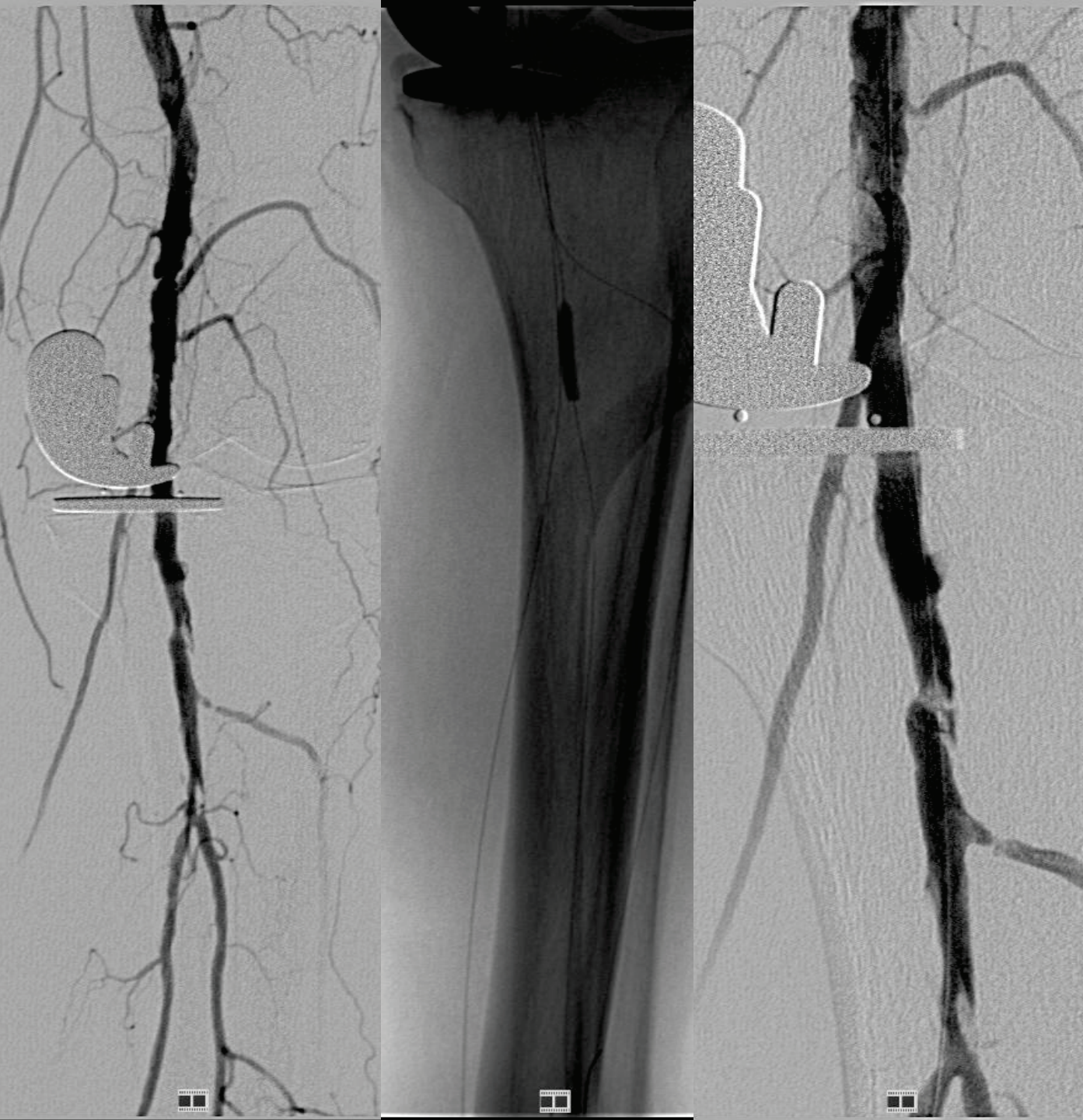
4F Lysekatheter

10 mg rTPA/12h

PTA 5/60 mm

3x 0,014" FD, PTA 3mm

Kontrolle





# Lyse & Nitinolstent

PAVK IIb

Antegrader Zugang, 6F

4F Lysekatheter

10 mg rTPA/12h

PTA 5/60 mm

3x 0,014" FD, PTA 3mm

Kontrolle

6/20 Nitinol Stent





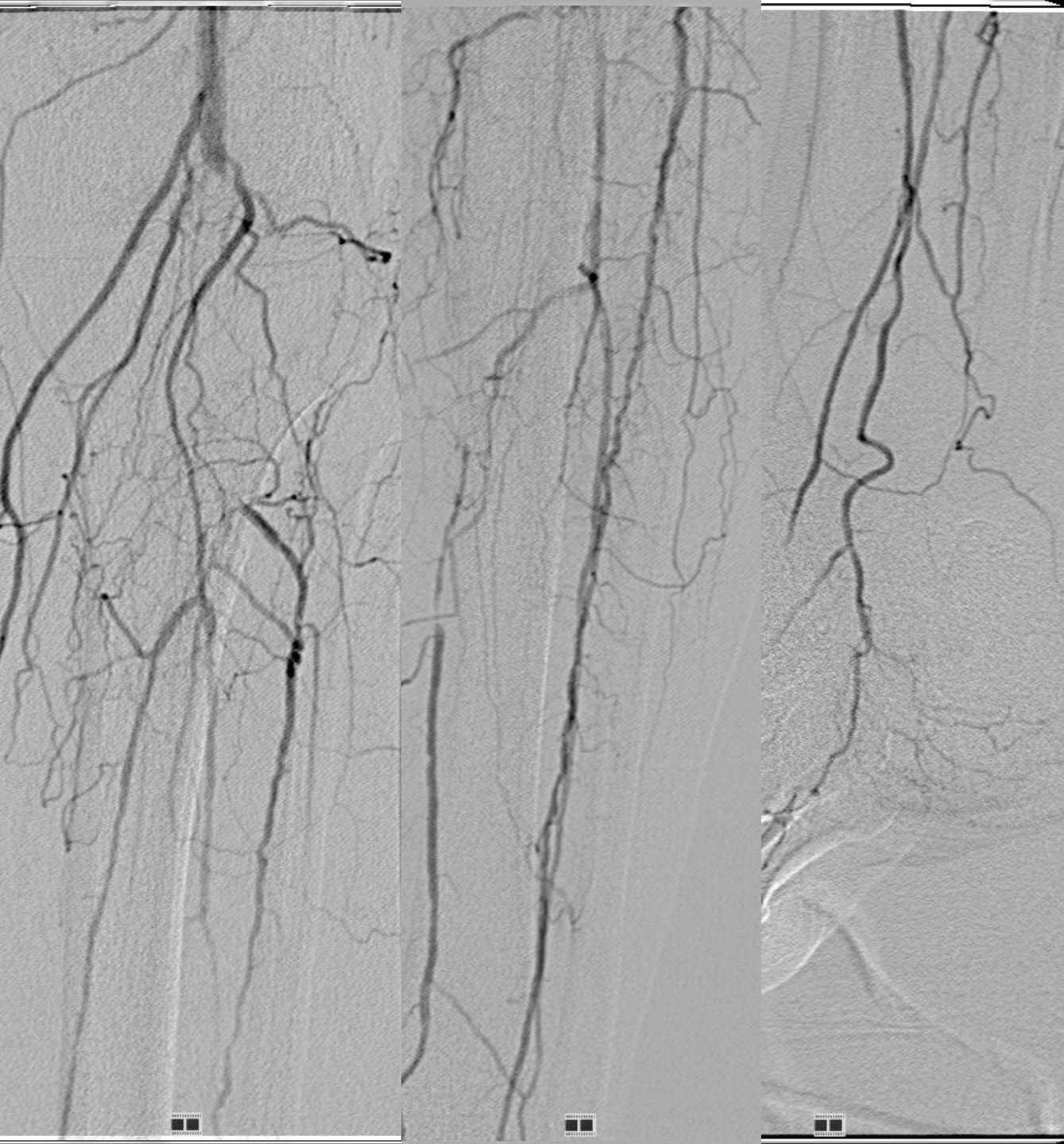
# Lyse & Paclitaxel PTA

PAVK III

Crossover Zugang, 6F

4F Lysekatheter

10 mg rTPA/12h





# Lyse & aclitaxel PTA

PAVK III

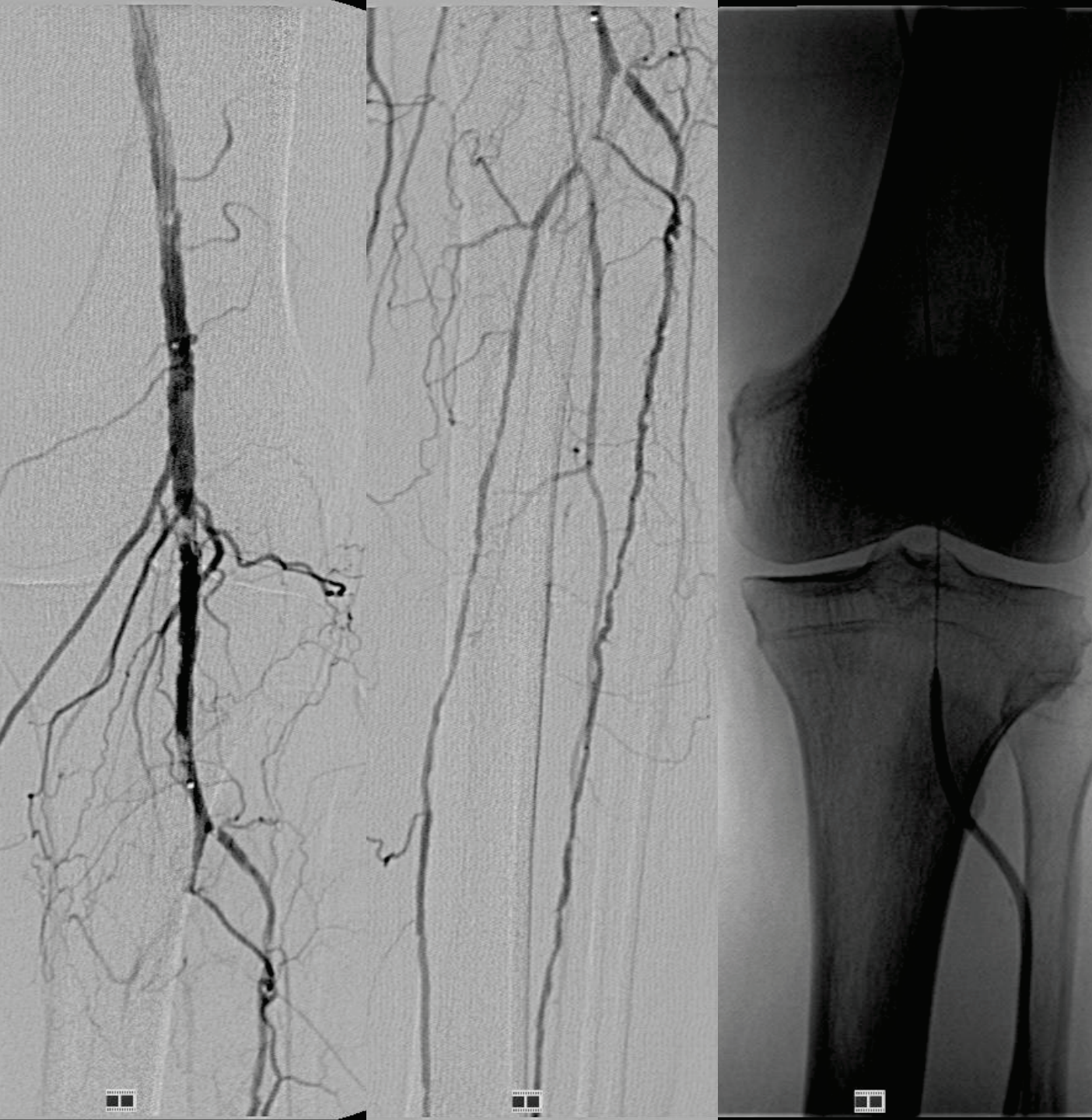
Crossover Zugang, 6F

4F Lysekatheter

10 mg rTPA/12h

Kontrolle

PTA 2,5/200 mm





# Lyse & Paclitaxel PTA

PAVK III

Crossover Zugang, 6F

4F Lysekatheter

10 mg rTPA/12h

Kontrolle

PTA 2,5/200 mm

4/40 mm Paclitaxel PTA

PTA 2,5/200 mm





# Lyse & Paclitaxel PTA

PAVK III

Crossover Zugang, 6F

4F Lysekatheter

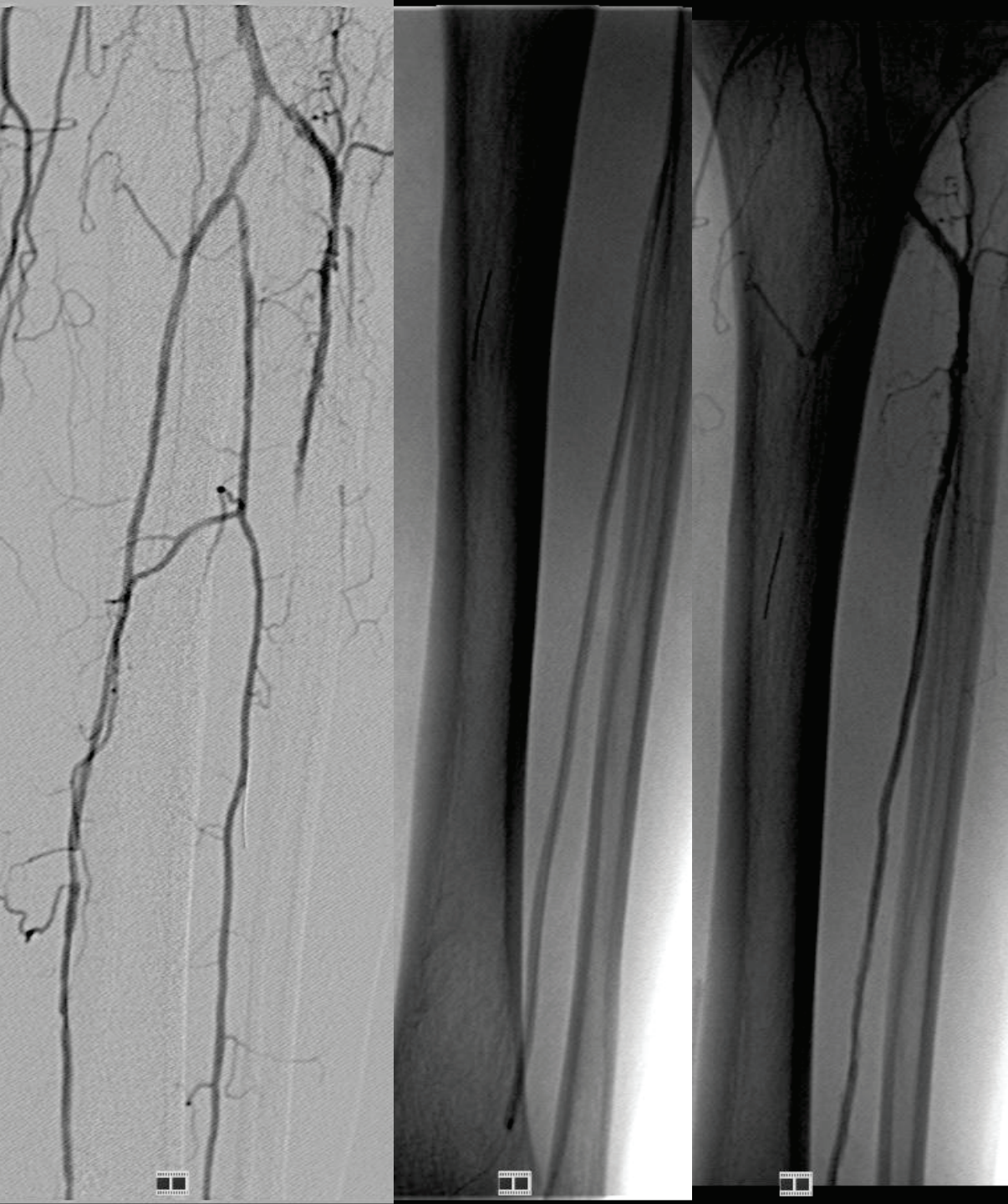
10 mg rTPA/12h

Kontrolle

PTA 2,5/200 mm

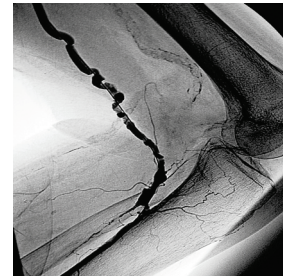
4/40 mm Paclitaxel PTA

PTA 2,5/200 mm



# Chronische Verschlüsse

# A. Poplitea ...



- **Akut**
  - Aspiration
  - Lyse
  - mechan. Rekanalisation
  - Graft
- **Stents**
  - Nitinol?
  - Ballonmontiert?
  - Helikale Stents
  - Endograft
- **Chronisch**
  - (Lyse)
  - Rekanalisation
  - PTA (plein, DEB)
  - Stents (Metall/Graft)
- **Aneurysma**
  - Embolisierend
  - Lyse
  - Rupturgefahr
  - Endograft



# PTA CTO

PAVK III

4F antegrad

4F Katheter, 0.014" FD

PTA 2.5/120 mm





# PTA CTO

PAVK III

4F antegrad

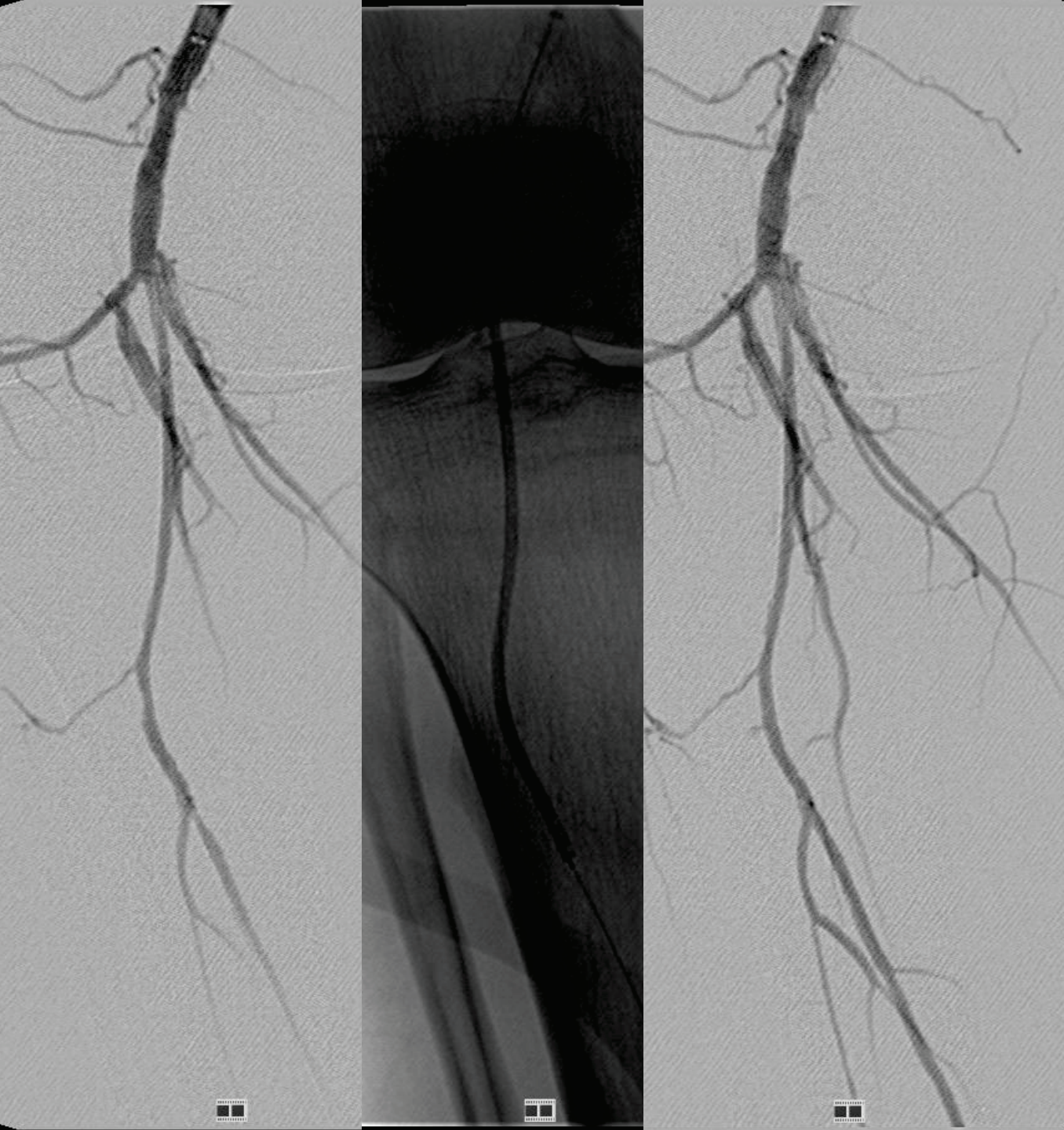
4F Katheter, 0.014" FD

PTA 2.5/120 mm

2.5/120 mm Paclitaxel PTA

Warum kein Stent?

Kalibersprung POP/US!





s nicht?

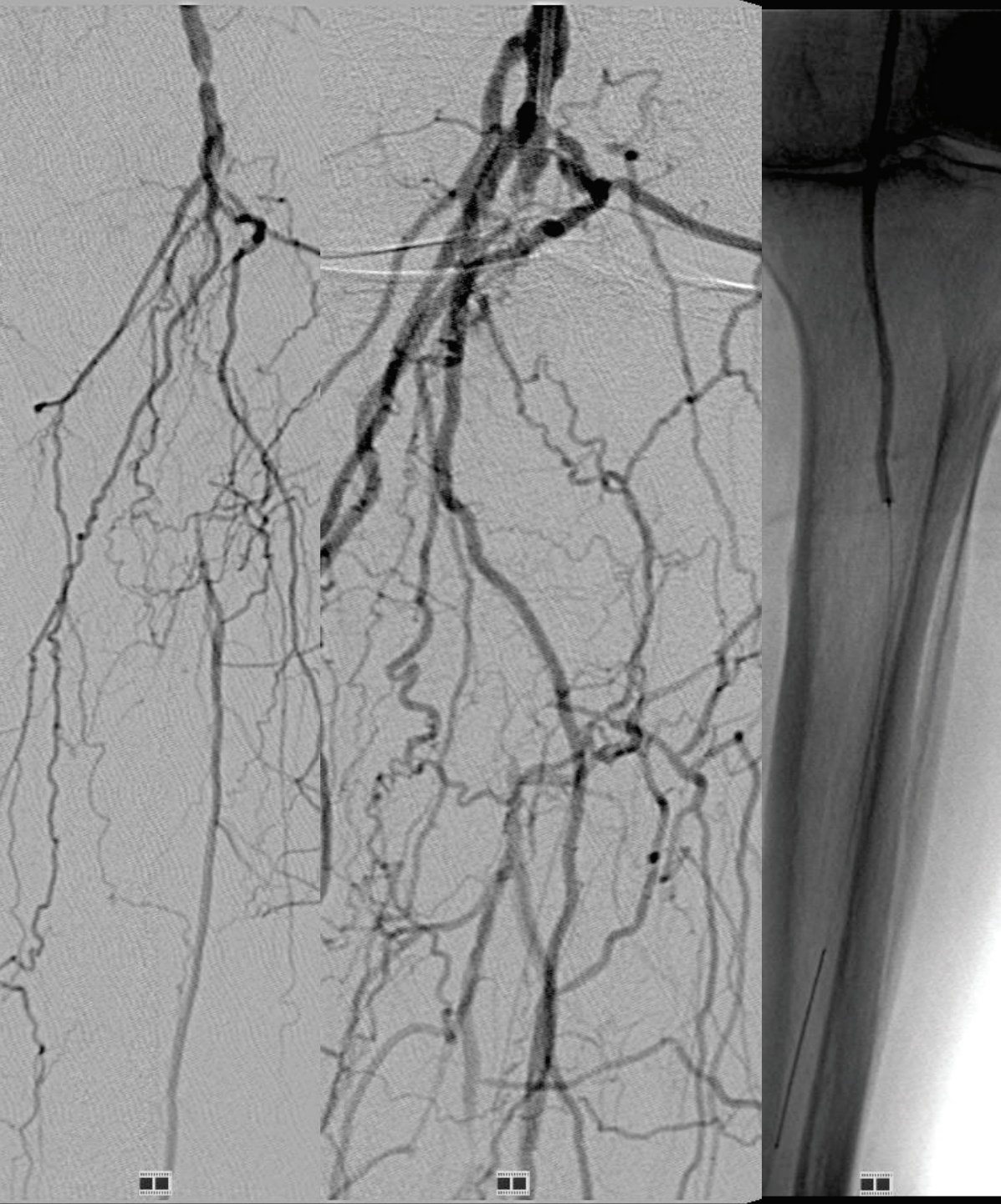
# PTA CTO

PAVK III

4F antegrad

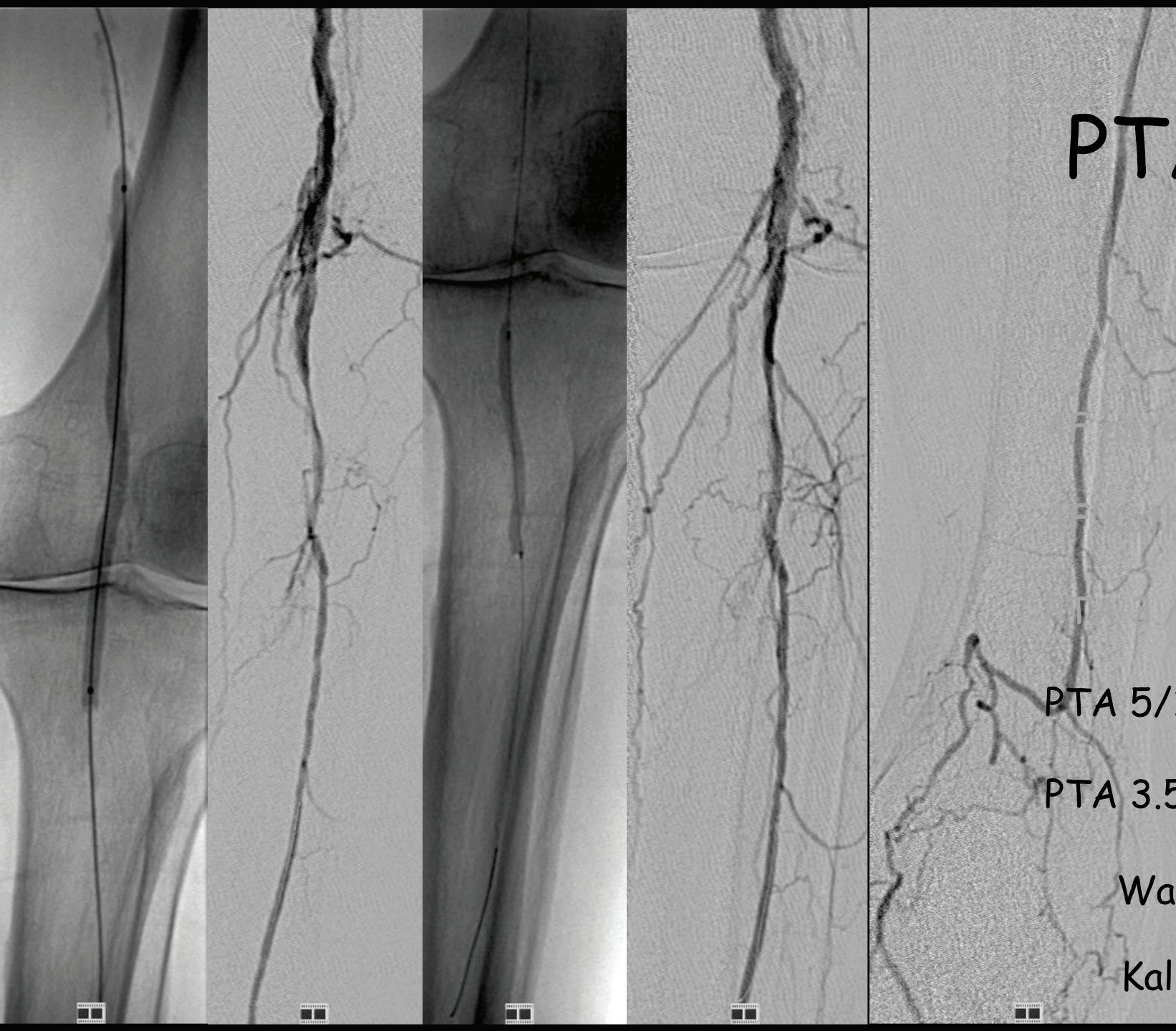
4F Katheter, 0.014" FD

PTA 3./120 mm





# PTA CTO



II  
grad  
eter, 0.014" FD  
120 mm

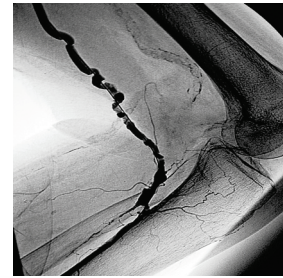
PTA 5/150 Paclitaxel

PTA 3.5/40 PTA

Warum kein Stent?

Kalibersprung POP/US!

# A. Poplitea ...



- Akut
  - Aspiration
  - Lyse
  - mechan. Rekanalisation
  - Graft
- Chronisch
  - (Lyse)
  - Rekanalisation
  - PTA (plein, DEB)
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- Stents
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  - Rupturgefahr
  - Endograft

# Rekanalisation/Stents



# Outback Nitinolstent

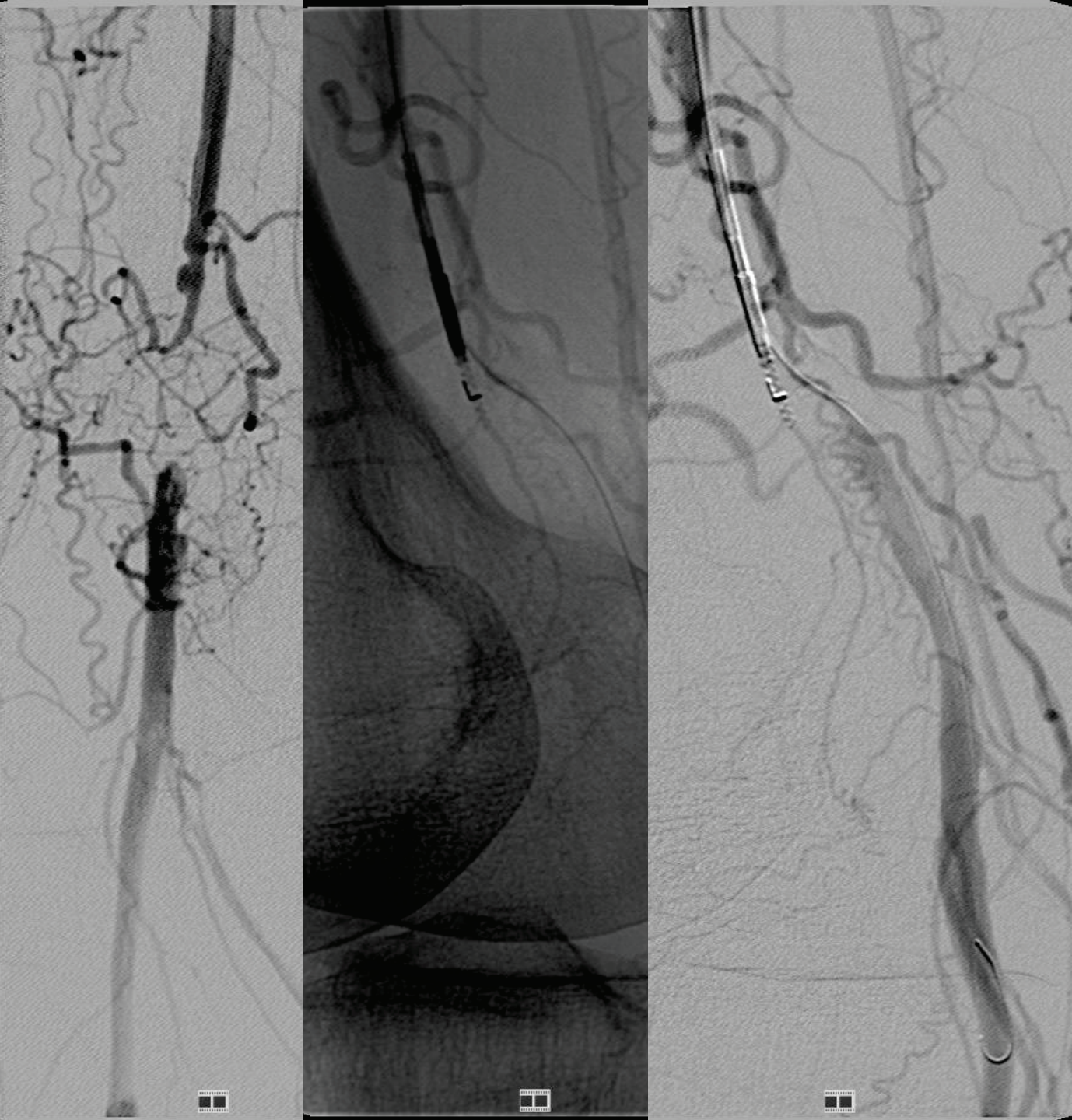
PAVK III

4F antegrad

4F Katheter, 0.014" FD

6F Schleuse

Outback





# Outback Nitinolstent

PAVK III

4F antegrad

4F Katheter, 0.014" FD

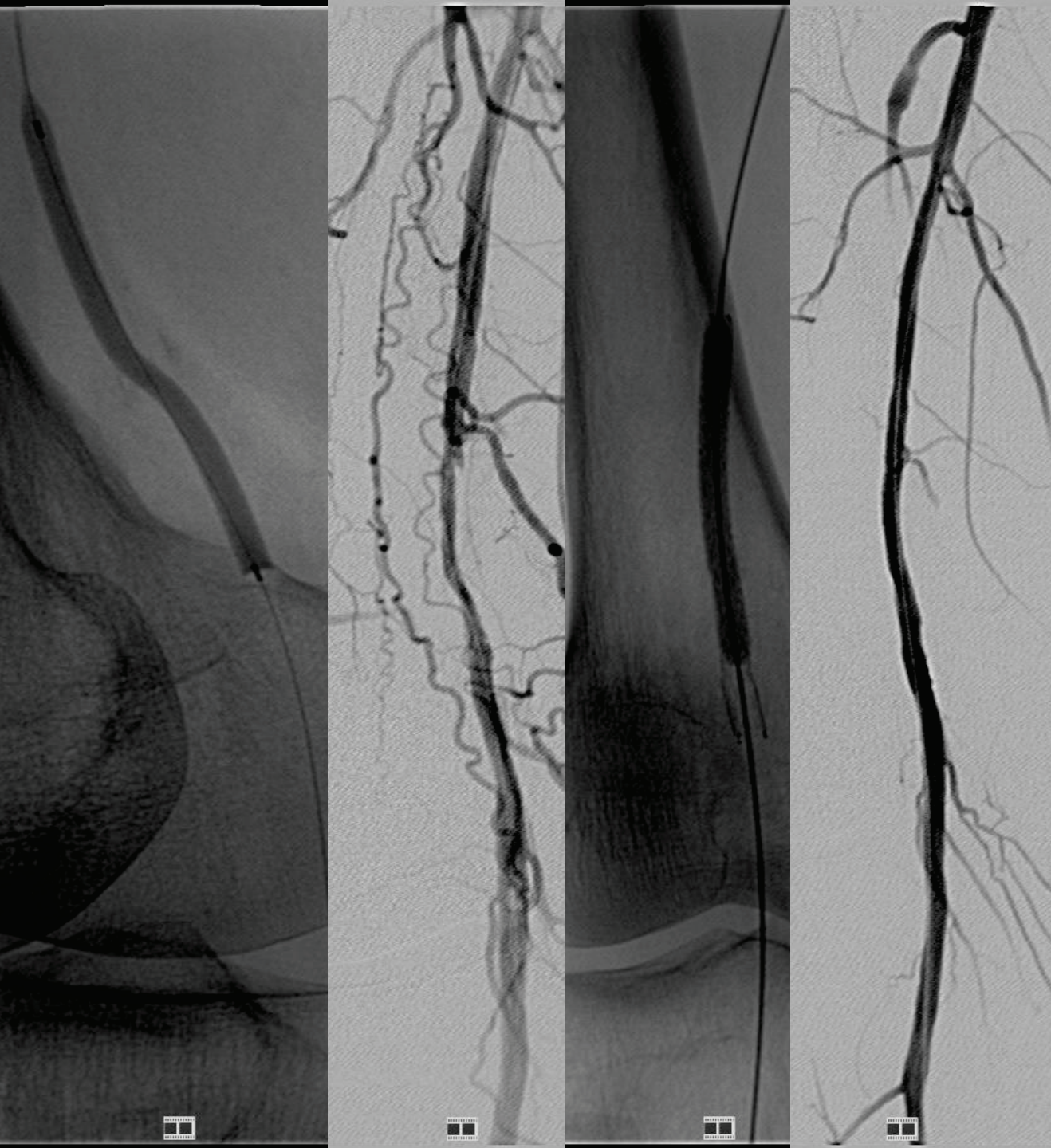
6F Schleuse

Outback

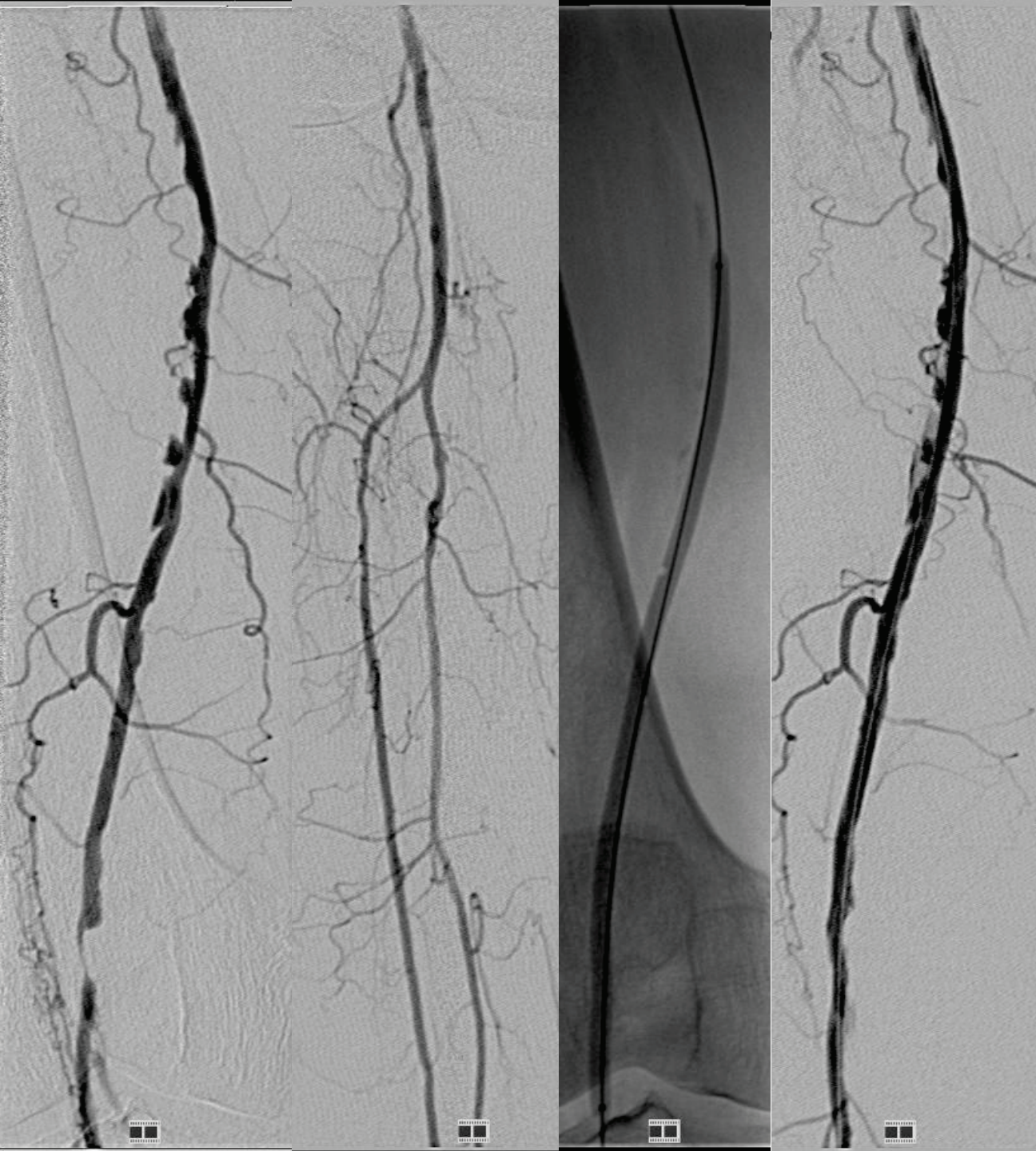
PTA 3.5/60 mm

Nitinol 7/80 mm

PTA 5/60 mm







nt?

# Supera Stent

PAVK IIb OS-Typ

0.035"FD

6F Schleuse

PTA 5/150 mm



nicht?

# Supera Stent

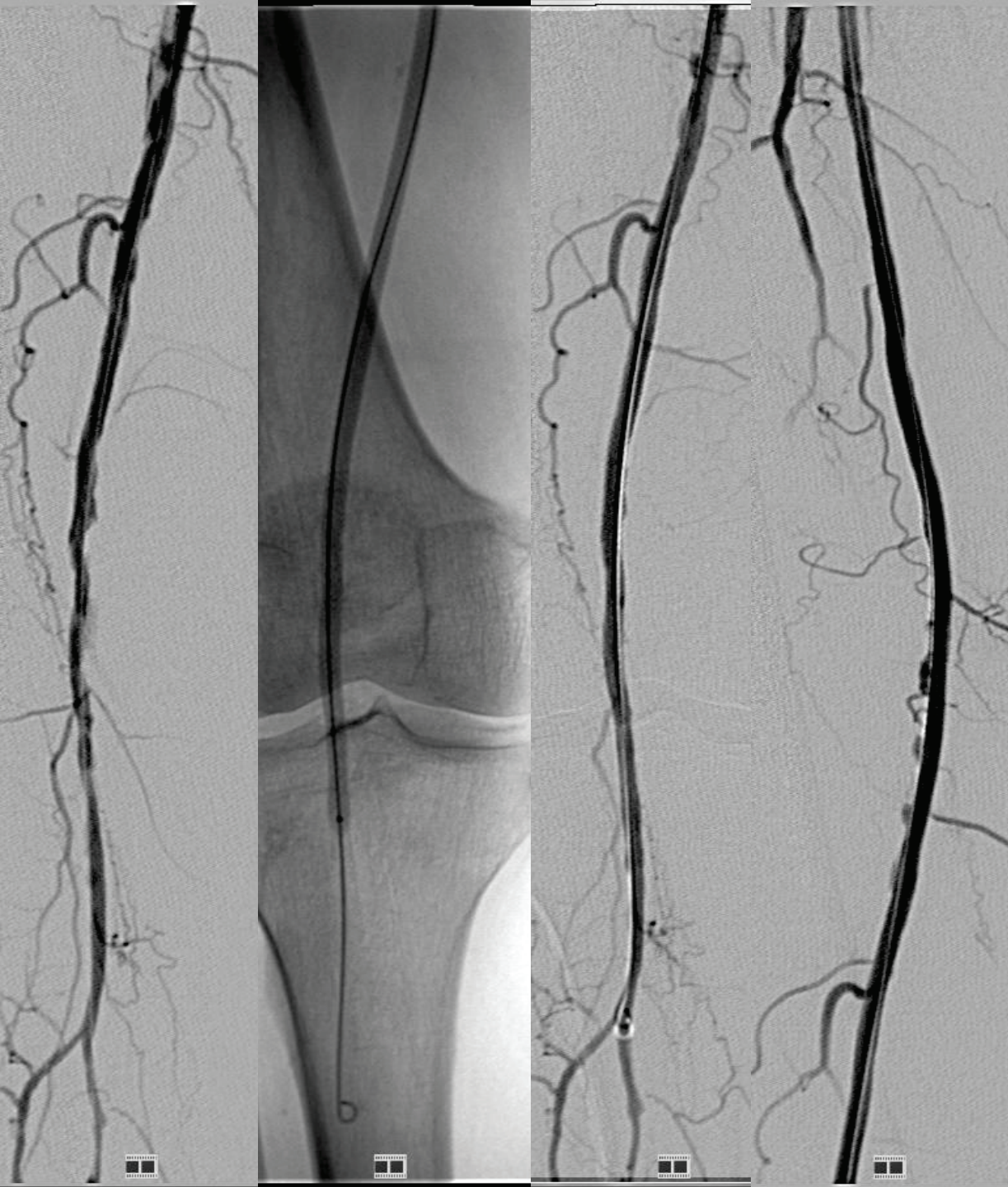
PAVK IIb OS-Typ

0.035"FD

6F Schleuse

PTA 5/150 mm

5/150 mm Supera





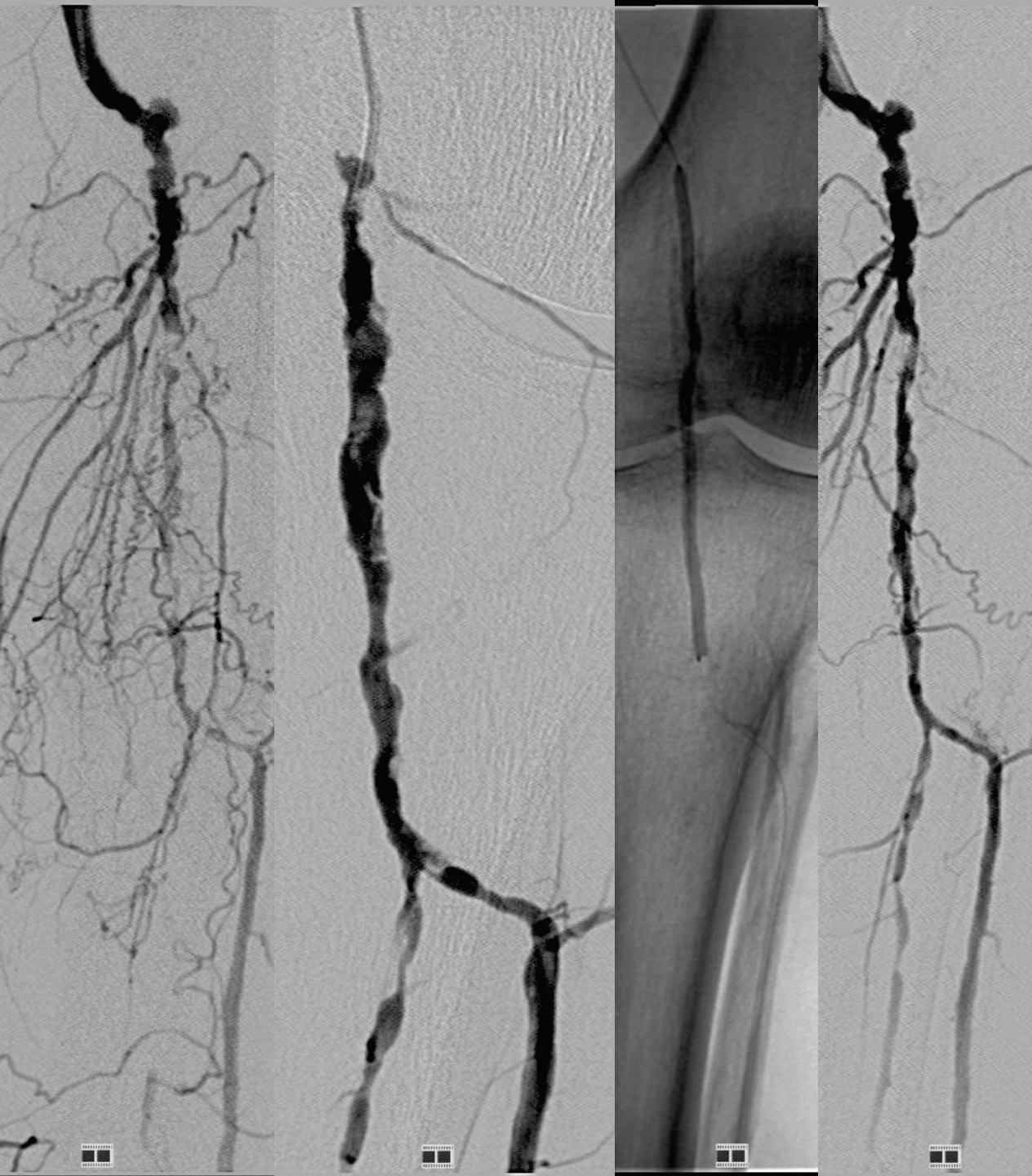
# Supera Stent Paclitaxel PTA

PAVK IV , fem-pop Bypass,  
distal okklusiv

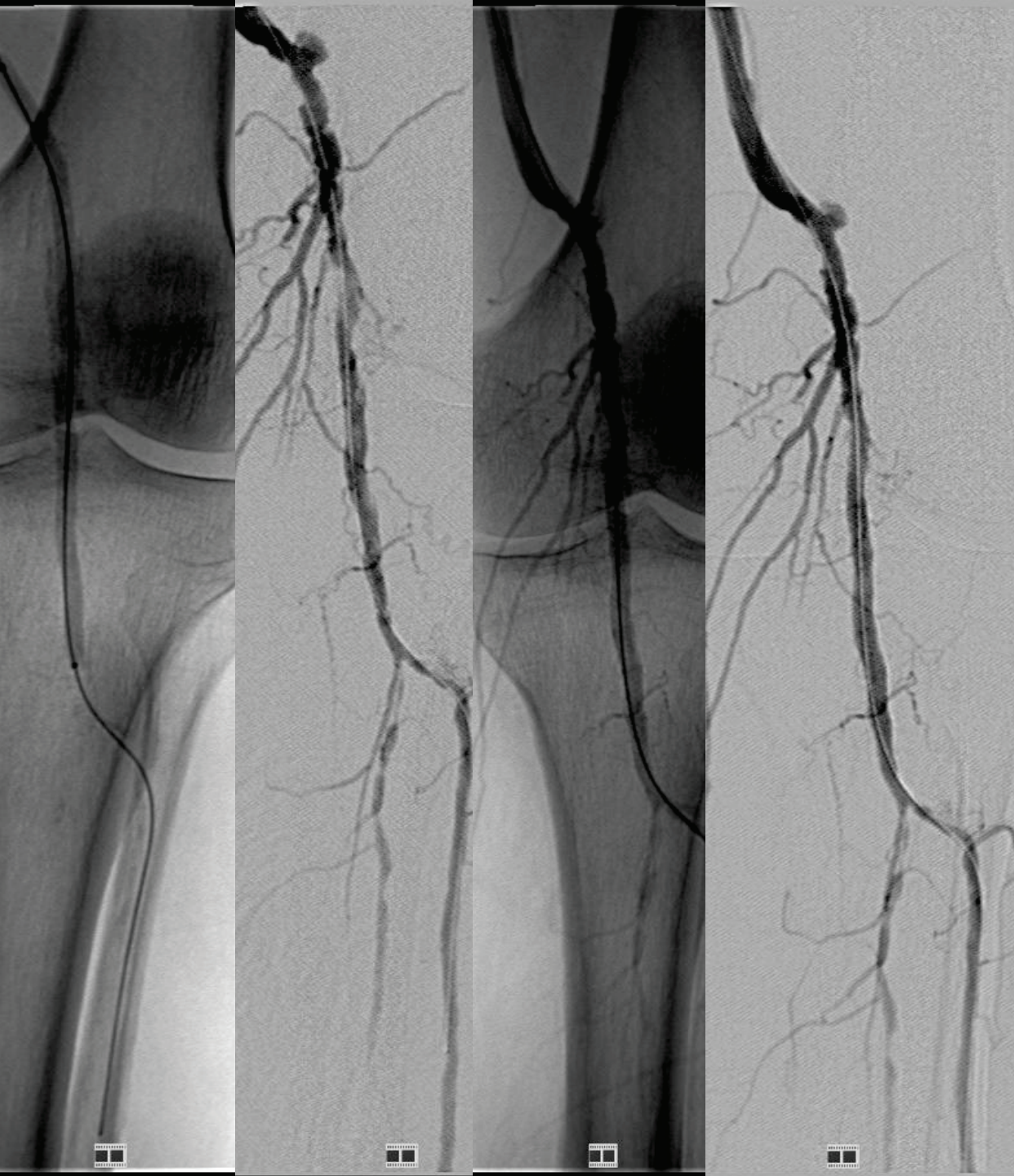
0.035"/0.014" FD

6F Schleuse

PTA 3/100 mm







# Supera Stent Paclitaxel PTA

PAVK IV , fem-pop Bypass,  
distal okklusiv

0.035"/0.014" FD

6F Schleuse

PTA 3/100 mm

PTA 5/100 mm

5/150 mm Supera



nicht?

# Supera Stent Paclitaxel PTA

PAVK IV , fem-pop Bypass,  
distal okklusiv

0.035"/0.014" FD

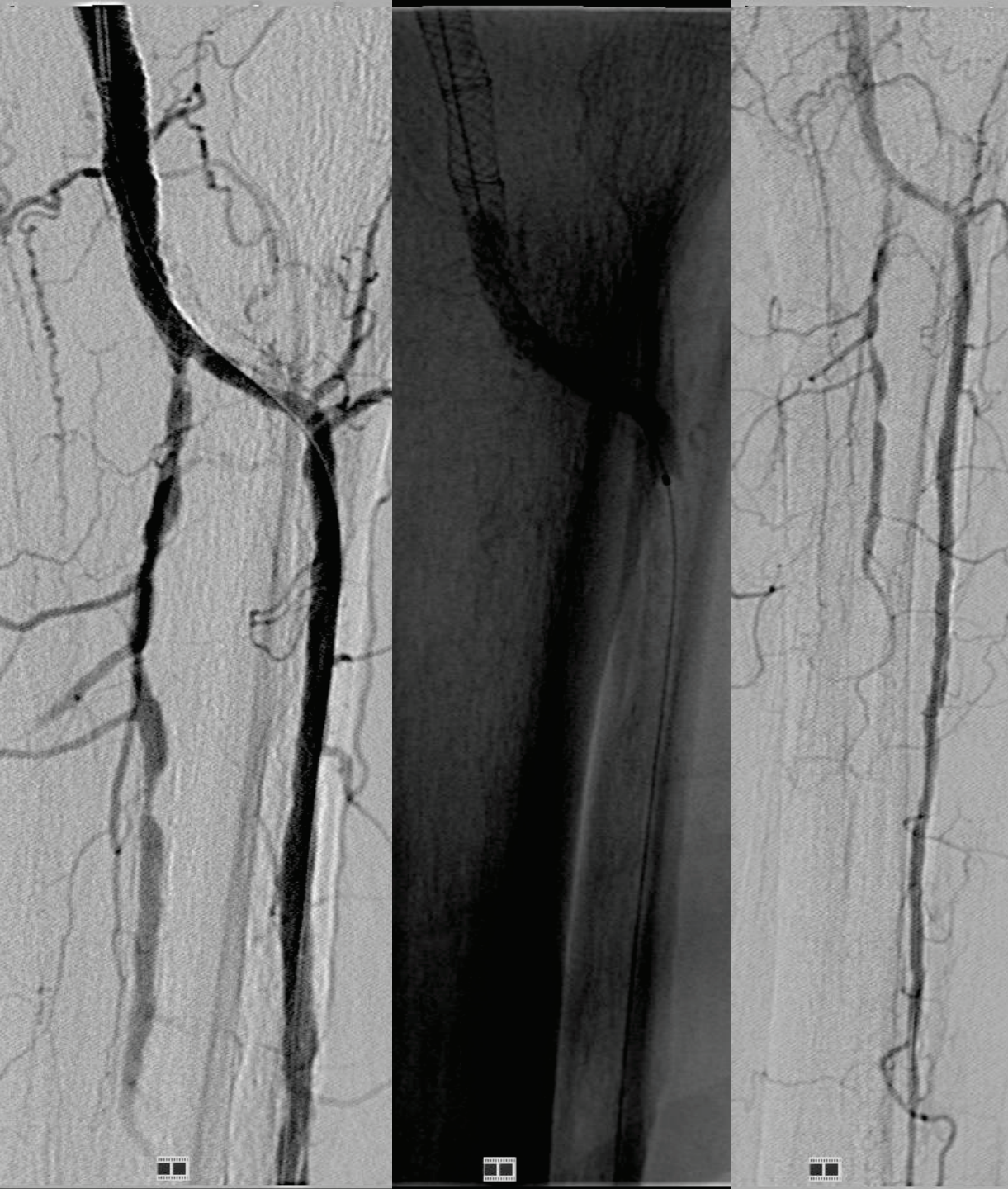
6F Schleuse

PTA 3/100 mm

PTA 5/100 mm

5/150 mm Supera

PTA 3.5/40 mm Paclitaxel



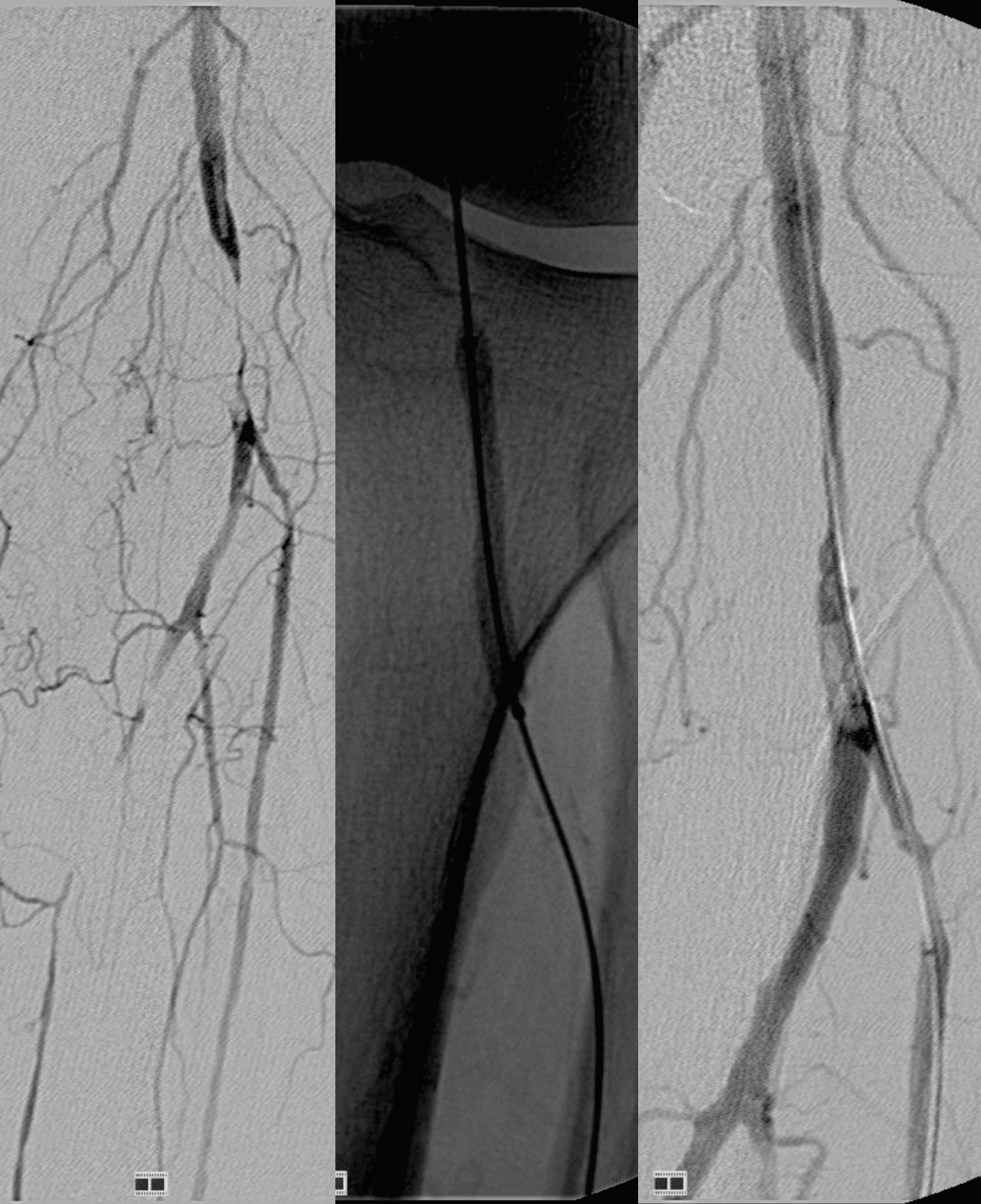


# Viabahn Stenose & Thrombus

PAVK IV,  
0.035"/0.014" FD

6/7F Schleuse

PTA 4/40mm





# Viabahn Stenose & Thrombus

PAVK IV,  
0.035"/0.014" FD

6/7F Schleuse

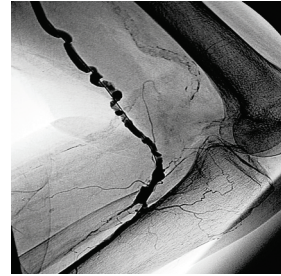
PTA 4/40mm

5/50 mm Viabahn

(... PTA US)



# A. Poplitea ...



- **Akut**
  - Aspiration
  - Lyse
  - mechan. Rekanalisation
  - Graft
- **Stents**
  - Nitinol?
  - Ballonmontiert?
  - Helikale Stents
  - Endograft
- **Chronisch**
  - (Lyse)
  - Rekanalisation
  - PTA (plein, DEB)
  - Stents (Metall/Graft)
- **Aneurysma**
  - Embolisierend
  - Lyse
  - Rupturgefahr
  - Endograft

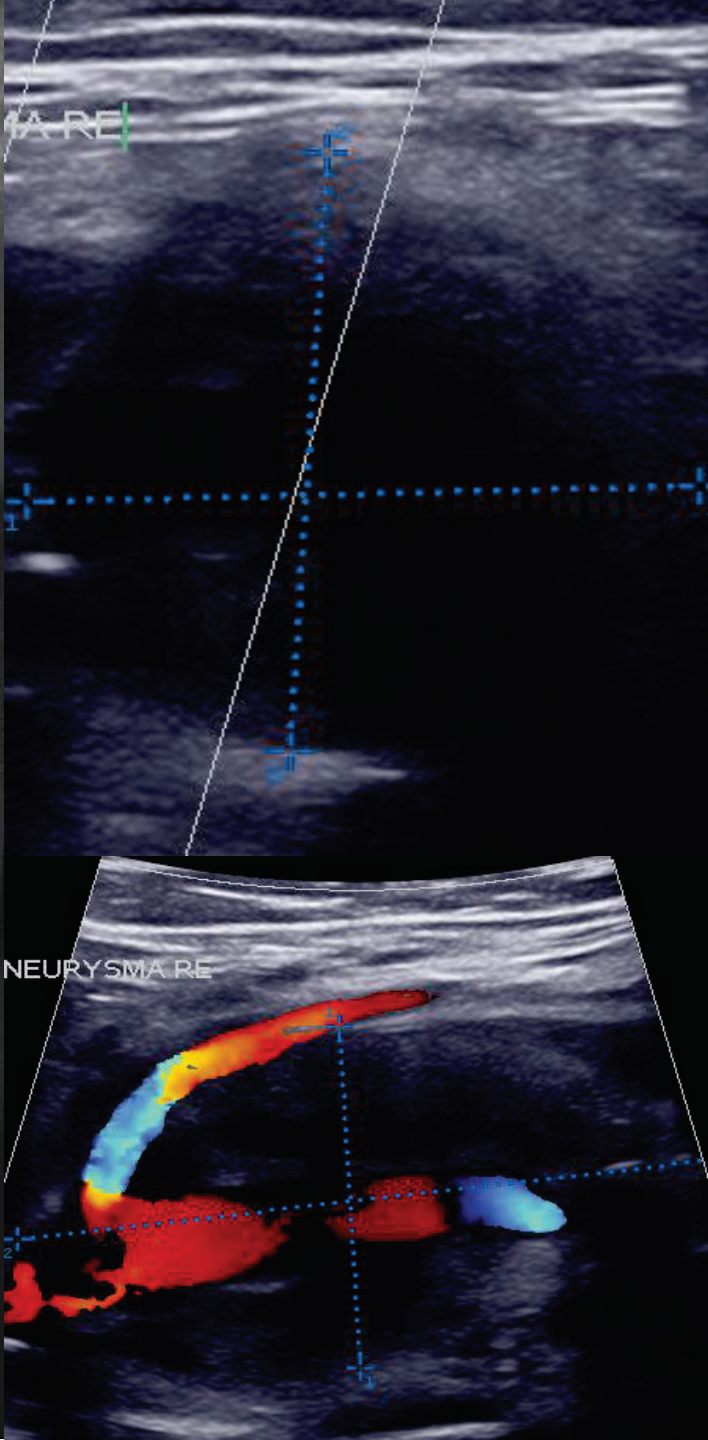
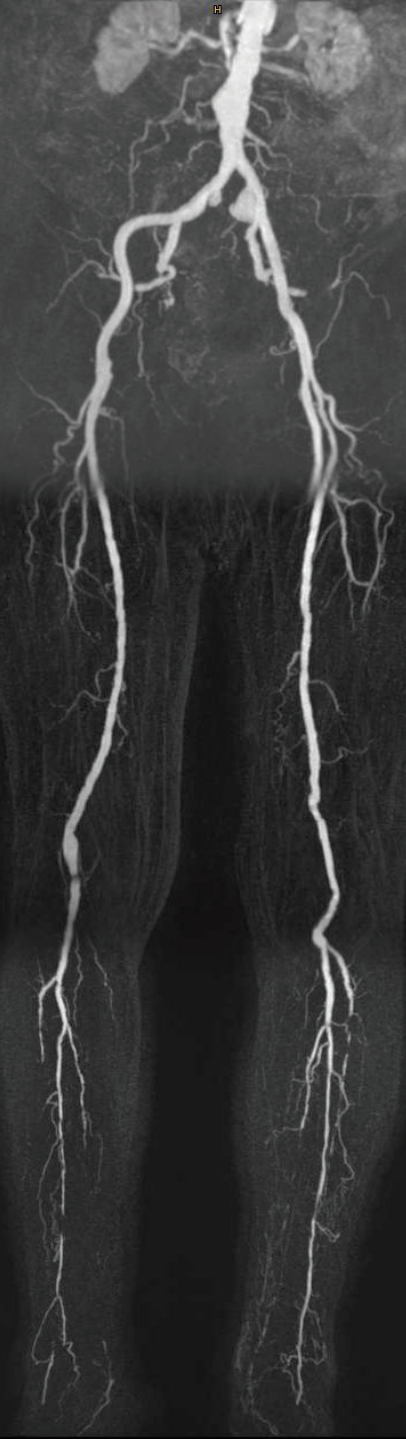
# Popliteaneurysma

# Popliteaaneurysma - Ausschaltung durch Viabahn

Inzidenz 0.1-1%

Autor	Pat.	FU	Sek. Offenheit
Jung 2010	13	54	100%
Pulli 2012	20	22.5	78.4%
Gark 2012	21	22	91.2%
Guzzardi 2012	10	12	100%





, was nicht?

# Viabahn PTA US

PAVK IIB, eGFR <50

# Viabahn PTA US

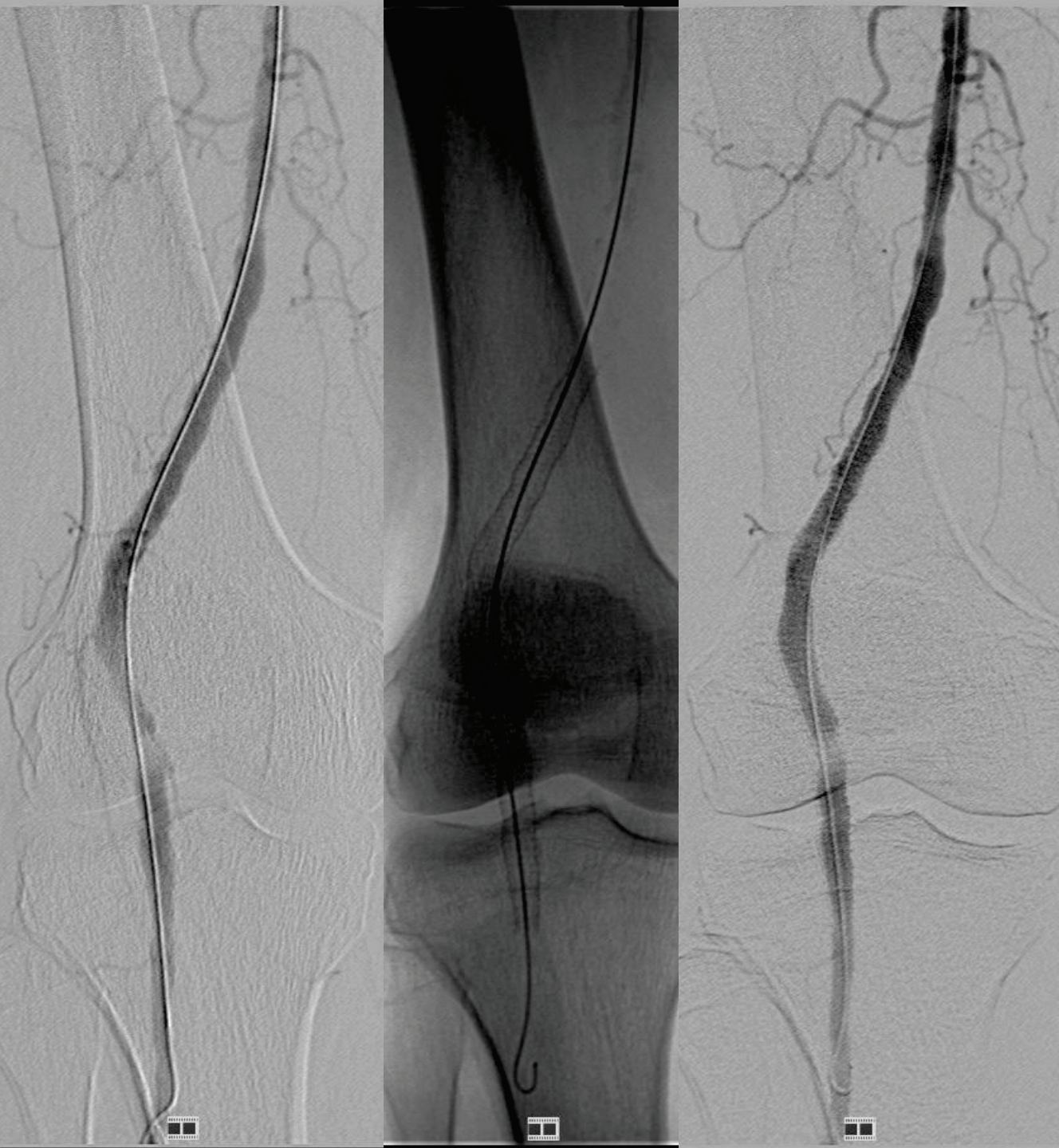
PAVK IIB, eGFR <50

0.035"/0.014" FD

6/7F Schleuse

PTA 4/40mm

9/150 mm Viabahn





# Viabahn PTA US

Diabetes, eGFR <50

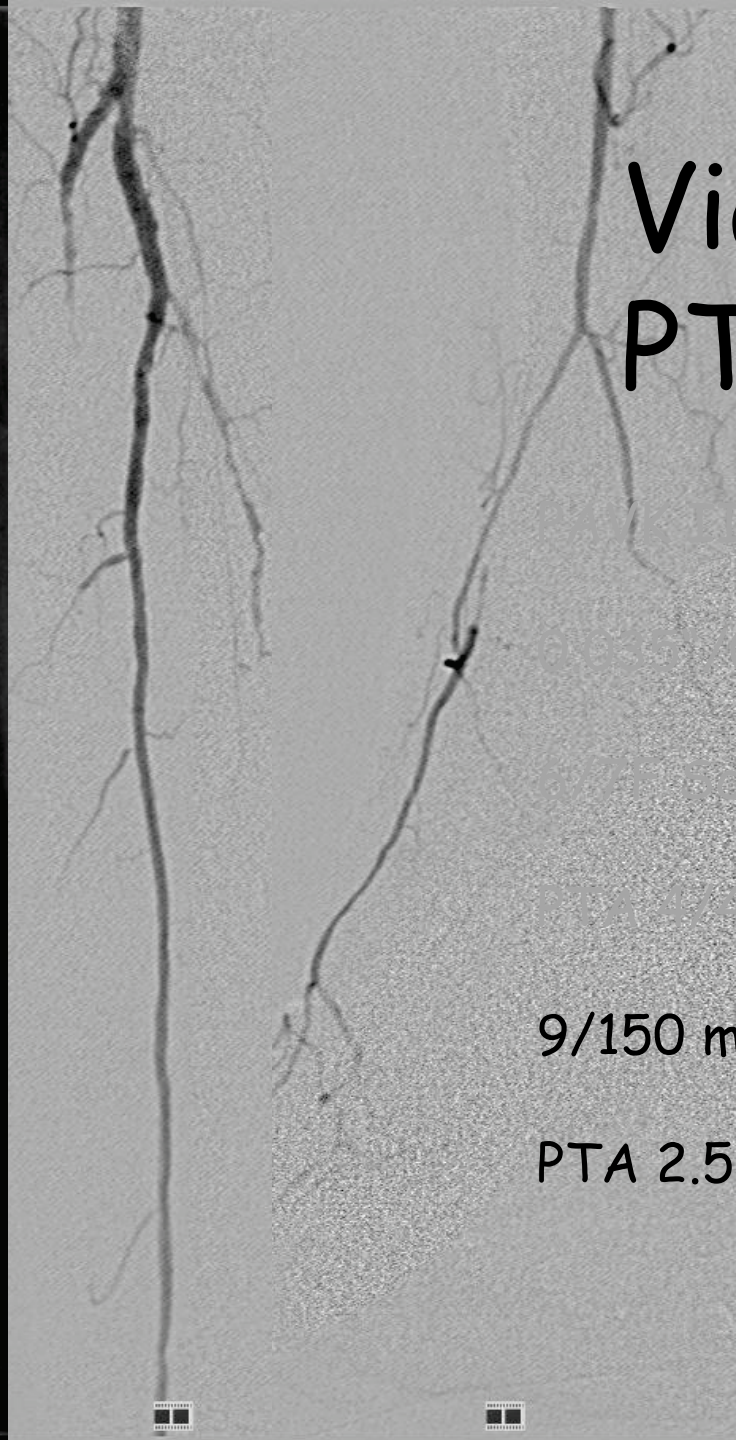
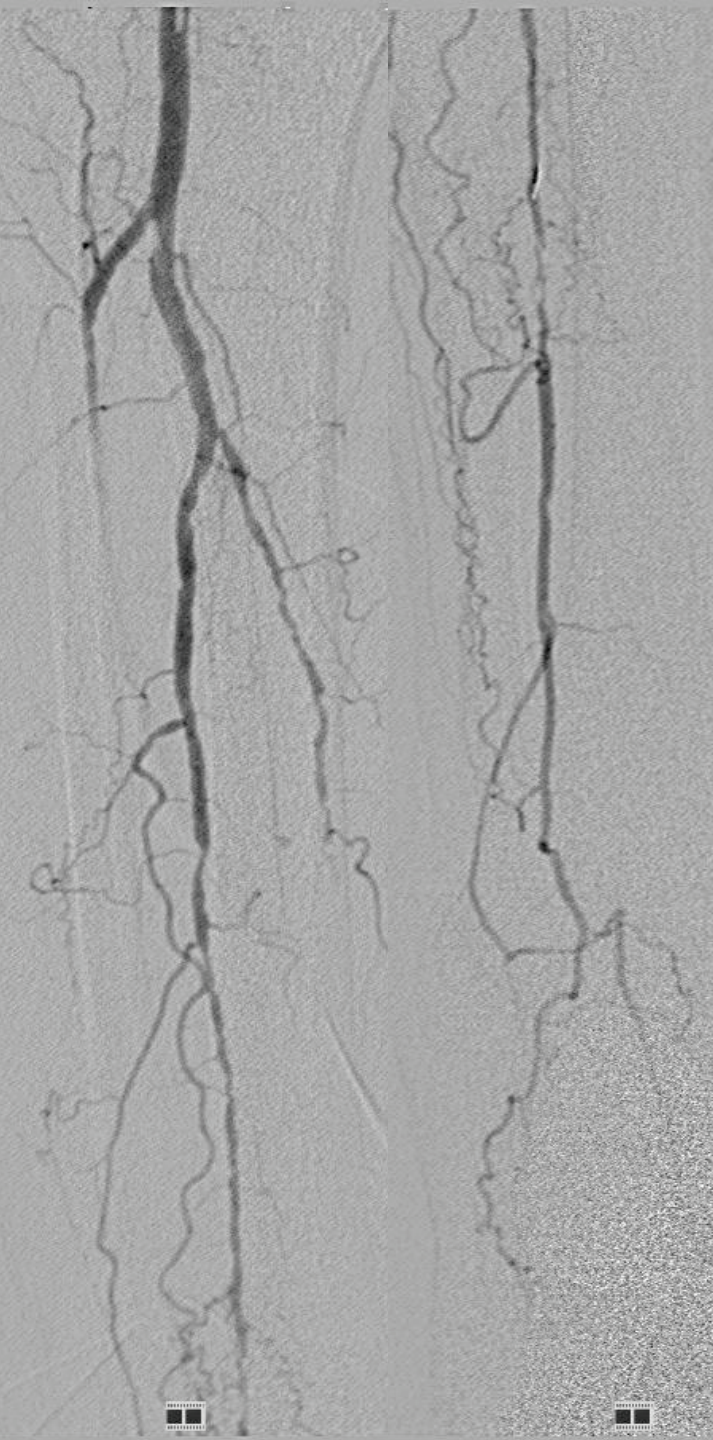
0.014" FD

Stentlose

PTA 4/20mm

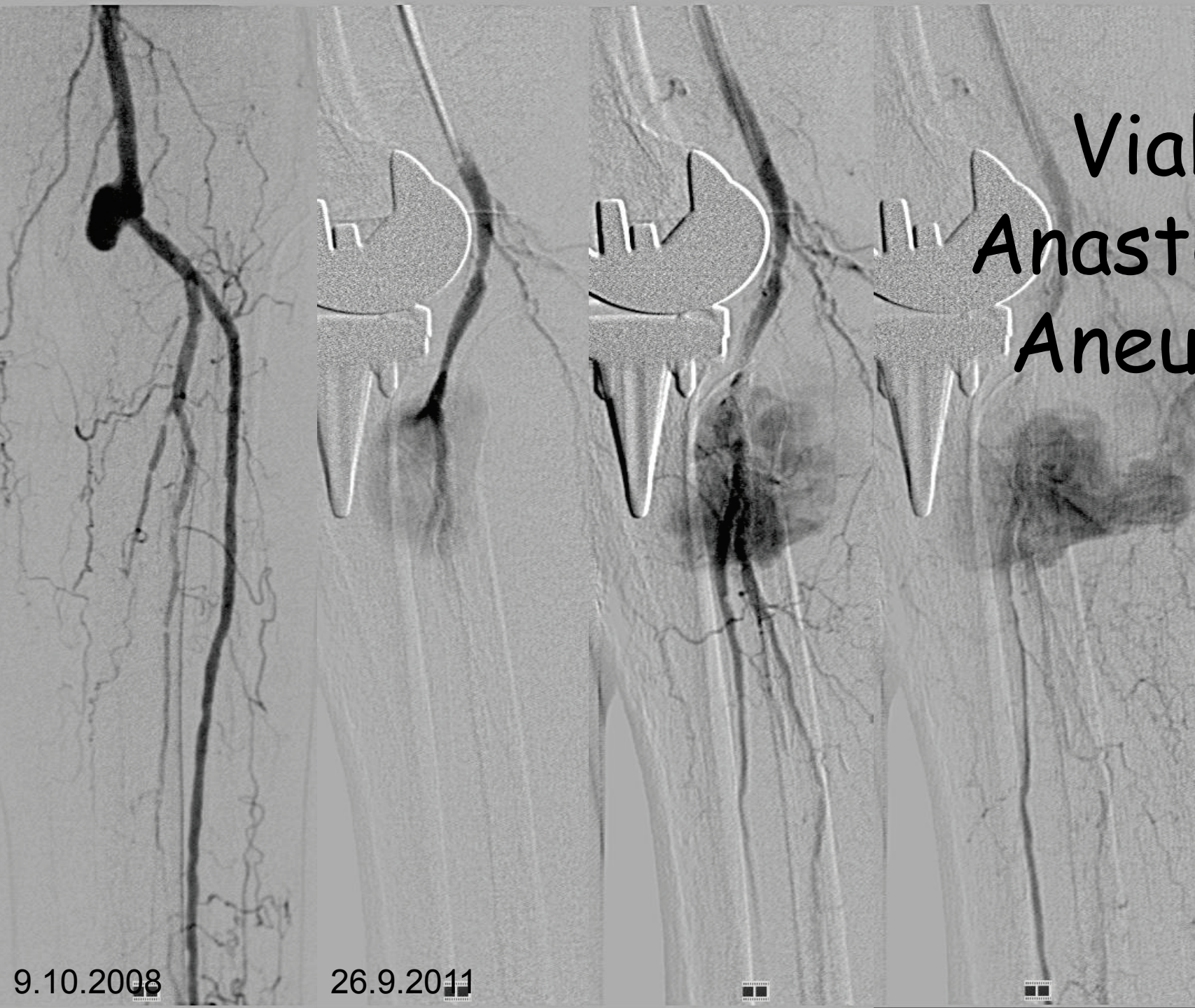
9/150 mm Viabahn

PTA 2.5-3/210 mm





# Viabahn Anastomosen Aneurysma



9.10.2008

26.9.2011





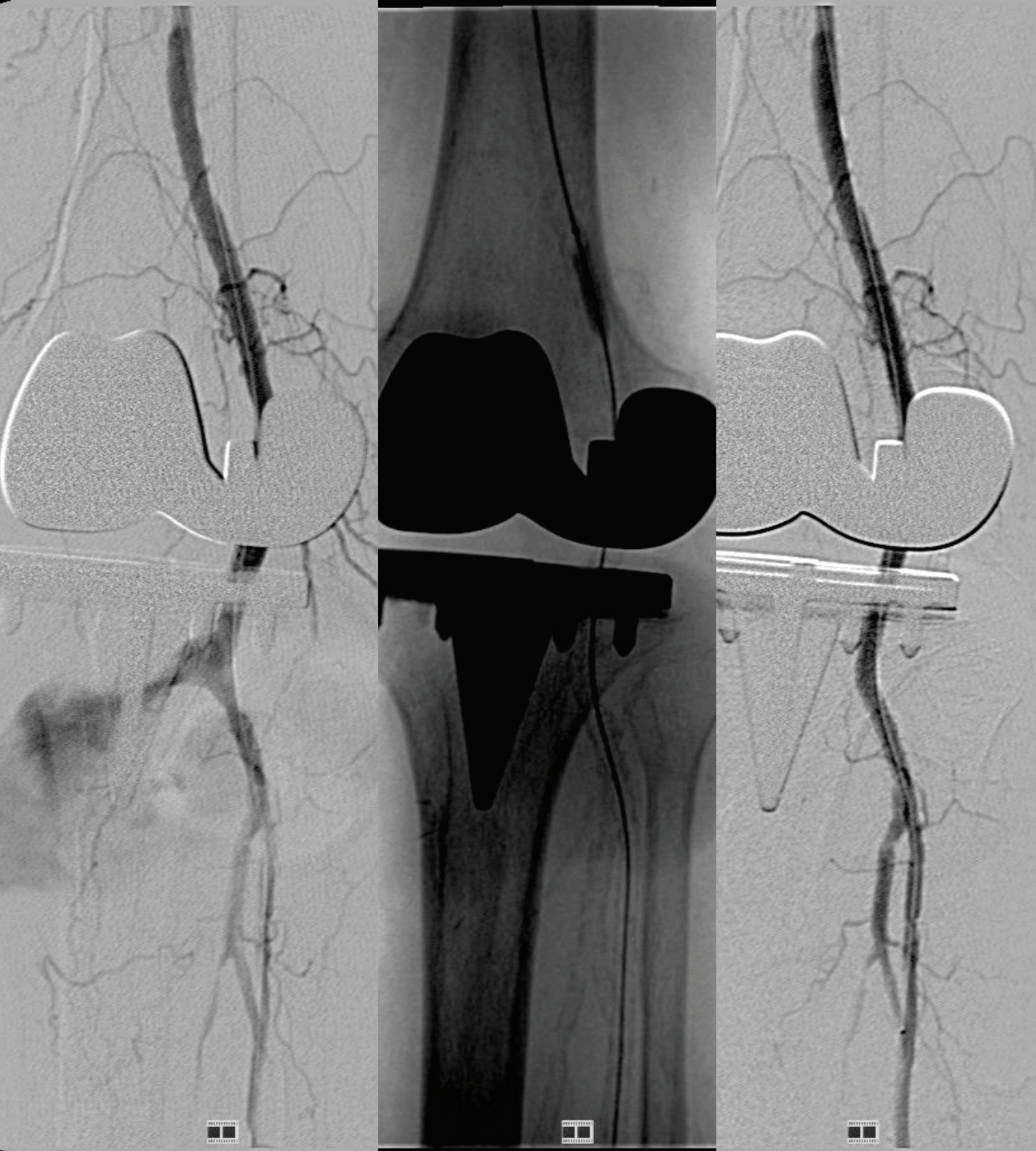
# Viabahn Anastomosen Aneurysma

0.035"

7F Schleuse

5/100 mm Viabahn

PTA 5/20 mm



# Zusammenfassung:

- Rekanalisation der A. pop. meistens möglich
- nachhaltiges Ergebnis anstreben
- Kenntnis aller Rekanalisationstechniken
- Stent vermeiden; wenn, dann dedizierte Stent/Grafts (z.B. Supera, Viabahn ...)
- keine OP-Möglichkeit „verbauen“
- im Zweifel -hartnäckig sein!





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poplitea: was geht, was nicht?

# Silverhawk

PAVK IV

eGFTR < 45

7F Schleuse

7F Silverhawk

PTA 3/60 mm

PTA 4/20 mm

