

LEIPZIG
INTERVENTIONAL
COURSE
2020

LIN C

28 – 31 January 2020

Trade Fair Leipzig, Hall 2
Messe-Allee 1, 04356 Leipzig,
Germany

Guide to Live Case
Transmissions

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Guide to Live Case Transmissions

During the Leipzig Interventional Course 2020 more than 70 interventional and surgical live cases are scheduled to be performed and transmitted to the auditorium. The aim of this booklet is to give you an overview about the live case schedule and to provide a practical guide through the procedures.

We hope for your understanding that with respect to the clinical needs of the patients changes of the schedule may occur. Furthermore, the anticipated procedural steps are just an outline of the procedure. Depending on the discretion of the operator the procedural strategy or the choice of material may vary.

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2020

L I N C

Tuesday,
January 28, 2020

Case 01 – LEI 01: male, 59 years (K-A)

Long SFA-reocclusion right

Operators: S. Bräunlich, M. Ulrich

Clinical data: PAOD Rutherford 3, severe claudication right calf, walking capacity 150m, ABI right 0.65
PTA with DCBs 10/18
Osteoporosis

Risk factors: Arterial hypertension, hyperlipidemia, current smoker (40PY)

Procedural steps:

1. **Left groin retrograde and cross-over approach**
 - 0.035" SupraCore guidewire 190 cm (ABBOTT)
 - 7F 40 cm Balkin Up&Over sheath (COOK)
2. **Guidewire passage**
 - Command 18 and Armada 18 balloon (ABBOTT) or
 - 0.035" Radiofocus soft angled guidewire, 260 cm (TERUMO)
3. **In case of failure to pass the CTO**
 - GoBack™ Crossing Catheter (Upstream Peripheral)
4. **PTA**
 - 4.0 – 6.0 mm Armada 35 balloon (ABBOTT)
 - Conquest high pressure balloon on indication (BARD/BD)
5. **Stenting**
 - 5,5 or 6.6/200 mm Supera Interwoven Selfexpanding Nitinol stent (ABBOTT)



Case 02 – LEI 02: male, 67 years (H-F)

Calcified CTO of the left distal SFA and left popliteal artery**Operators:** A. Schmidt, A. Fischer**Clinical data:** PAOD Rutherford III left, painfree walking distance 10 m, ABI left: 0.3
CAD, CABG 2017, terminal kidney disease (dialysis)**Risk factors:** Arterial hypertension, hyperlipidemia**Procedural steps:**

1. **Right groin retrograde and cross-over approach**
 - 0.035" SupraCore guidewire 190 cm (ABBOTT)
 - 7F 40 cm Balkin Up&Over sheath (COOK)
2. **Guidewire passage**
 - Command 18 and Armada 18 balloon (ABBOTT) or
 - 0.035" Radiofocus soft angled guidewire, 260 cm (TERUMO)

In case of failure to pass the CTO:
3. **Retrograde approach via left peroneal artery**
4. **Vessel preparation/PTA**
 - 4.0 – 6.0 mm Armada 35 balloon (ABBOTT)
 - Conquest high pressure balloon on indication (BARD/BD)
5. **Stenting**
 - 5,5/120 mm Supera Interwoven Selfexpanding Nitinol stent (ABBOTT)

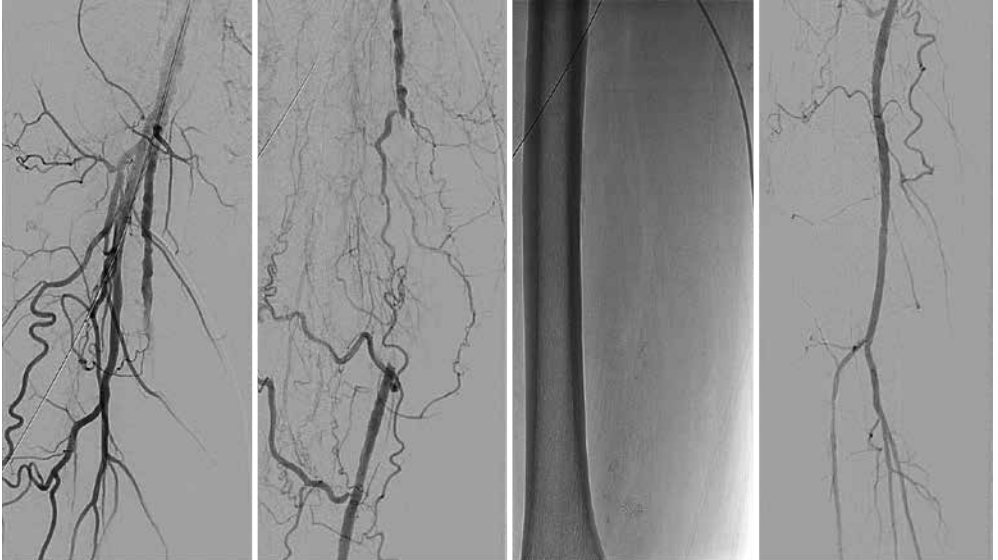
Case 03 – LEI 03: male, 63 years (A-F)

Subacute occlusion of the right SFA

Operators: S. Bräunlich, A. Schmidt

Clinical data: PAOD Rutherford 3, walking capacity 100 m, ABI right 0.49
PTA/stent left SFA 12/2019

Risk factors: Arterial hypertension, hyperlipidemia, former smoker (30PY)



Procedural steps:

- 1. Left groin and cross-over approach**
 - Judkins Right 5F diagnostic catheter (CORDIS/CARDINAL HEALTH)
 - 0.035" SupraCore guidewire 30 cm (ABBOTT)
 - 7F – 40 cm Balkin Up&Over sheath (COOK)
- 2. Guidewire passage of the occlusion**
 - 0.018" Command 18 300 cm (ABBOTT)
 - 0.035" QuickCross support catheter, 135 cm (PHILIPS)
 - Exchange to a 0.014" Floppy ES guidewire 300 cm (ABBOTT)
 - Confirm intraluminal position with Vision PV 0.14 IVUS (PHILIPS)
- 3. Laser atherectomy**
 - 7F Turbo Power Laser with Turbo Elite 2.3 mm catheter (PHILIPS)
- 4. PTA with DCBs**
 - Stellarex 5.0/120 mm or 6.0/120 mm DCBs (PHILIPS)
- 5. Stenting on indication**
 - Tack Endovascular System (INTACT VASCULAR)

Case 04 – BG 01: female, 76 years (B-T)

Below-the-knee treatment of a Rutherford IV CLI patient

Operators: A. Micari, F. Castriota

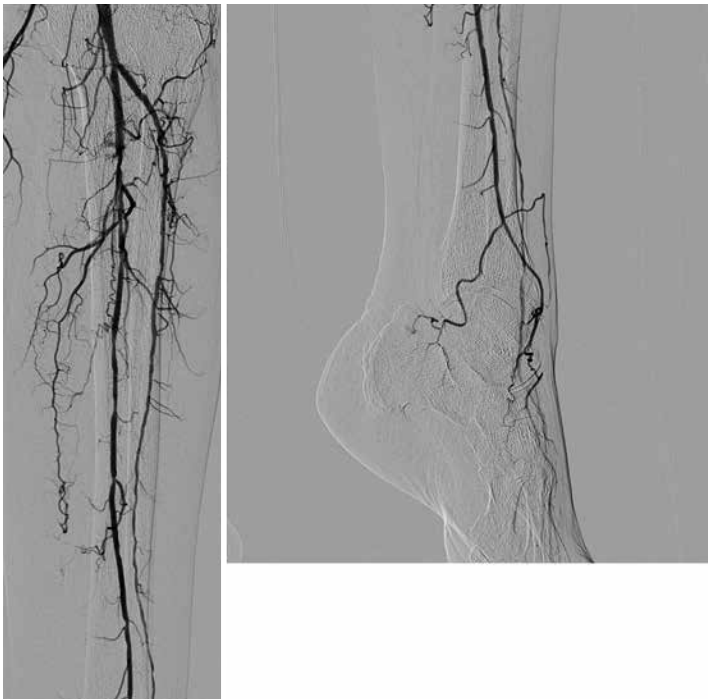
Clinical data: Previous left carotid endarterectomy
Previous multiple SFA angioplasties for claudication
Referred left leg pain at rest during the last week

Risk factors: Hypertension, hypercholesterolemia, type II diabetes

Angiography: Posterior tibial artery occlusion, severe disease of peroneal artery, distal anterior tibial artery occlusion

Procedural steps:

1. **Left femoral antegrade access 6 F**
2. **Lesion crossing**
 - 0.014" guidewire Choice PT (BOSTON SCIENTIFIC)
3. **Balloon dilatation**
4. **Evaluation of final result**
 - Angio and distal Duplex scan
5. **Drug eluting balloon dilatation if needed**
 - Stellarex BTK (PHILIPS)
6. **Postdilatation if needed**



Case 05 – BG 02: male, 67 years, (G-B)

Symptomatic occlusive early restenosis of right SFA

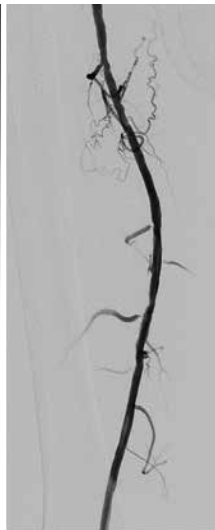
Operators: A. Micari, F. Castriota

Clinical data: No CV history
Previous right SFA PTA with plain balloon
During the last 3 months severe right leg claudication (walking distance 70 m)

Risk factors: Hypertension, hypercholesterolemia, previous history of smoking

Duplex: Distal right SFA occlusion with flow demodulation in BTK vessels

- Procedural steps:**
- 1. Femoral access (7F)**
 - 2. Lesion crossing**
 - 0.018" Control Wire + Berll 4F catheter
 - 3. Wire exchange**
 - 0.018" wire with 0.014" wire Choice PT (BOSTON SCIENTIFIC)
 - 4. Embolic protection**
 - Distal 6.0 mm Spider FX (MEDTRONIC)
 - 5. Directional atherectomy**
 - HawkOne (MEDTRONIC)
 - 6. Balloon dilatation**
 - 5.0 mm Inpact Admiral drug-coated balloon (MEDTRONIC)
 - 7. Postdilatation if needed**



Basal and final results of previous procedure (2018)



Angio-MRI showing reocclusion

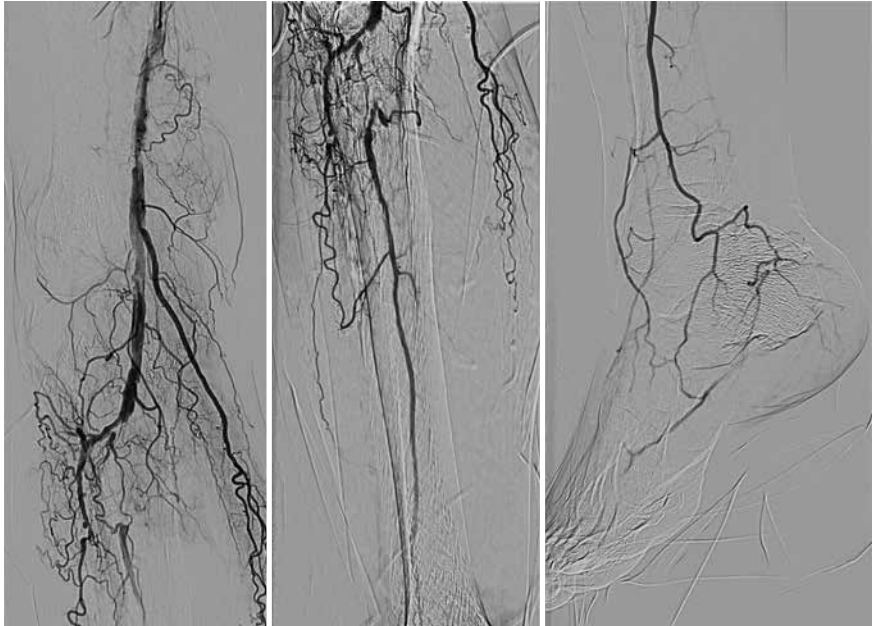
Case 06 – LEI 04: male, 78 years (A-T)

3-vessel disease BTK right

Operators: A. Schmidt, M. Ulrich

Clinical data: Critical limb ischemia right, rest-pain right forefoot
Walking capacity 50 meters, ABI right 0.49

Imaging: Duplex: occlusion of all BTK-arteries
DSA: TPT-occlusion, long occlusions of the ATA and PTA



Procedural steps:

1. **Antegrade access right**
 - 6F 55 cm sheath Flexor Check-Flo Introducer Raabe Modification (COOK)
2. **Guidewire passage of the TPT**
 - 0.014" Command ES (ABBOTT) or
 - 0.014" Winn 200 T (ABBOTT)
3. **Atherectomy of the TPT**
 - TurboHawk SX-C (MEDTRONIC)
 - potentially also atherectomy of the ATA-origin
4. **Balloon dilatation of the TPT and ATA**
 - Amphirion Deep (MEDTRONIC)
5. **Stenting on indication**
 - Tack Endovascular System (INTACT VASCULAR)

Case 07 – LEI 05: male, 79 years (J-B)

Critical limb ischemia left, CTO of ATA and PTA

Operators: A. Schmidt, A. Fischer

Clinical data: CLI left foot, minor ulcerations, rest-pain and recurrent infections
PTA right tibial arteries 2019 for CLI, forefoot amputation right
Diabetes mellitus type 2, art. hypertension

Imaging: Angiography of the left leg during PTA right BTK:
ATA and PTA-occlusion, diffuse forefoot disease

Procedural steps:

- 1. Antegrade access right**
 - 6F 55 cm sheath Flexor Check-Flo Introducer Raabe Modification (COOK)
- 2. Guidewire-passage of the posterior and or anterior tibial artery**
 - 0.014" Command ES (ABBOTT)
 - 0.018" Quick-Cross Support catheter 135 cm (PHILIPS)
- 3. Predilatation and DCB treatment**
 - Amphirion Deep 2.0/120 mm balloon (MEDTRONIC)
 - Litos 0.014" DCB (ACOTEC)
- 4. Stenting on indication**
 - Tack Endovascular System (INTACT VASCULAR)



Case 08 – BLN 01: female, 80 years (H-I)

Tandem-occlusion of SFA/P1, right

Operators: R. Langhoff, M. Boral

Clinical data: Bilateral CIA stenting in 2019, art. hypertension
 Mamma carcinoma in 2010 with surgery
 Long SFA occlusion bilateral with single vessel run-off
 ABI right: 0.7, left: 0.75
 Despite stenting of both CIA in 2019 she has impaired walking capacity

Risk factors: Art. hypertension, hypercholesterinemia



Procedural steps:

1. **Antegrade access right CFA**
 - 4F Radiofocus sheath (TERUMO)
2. **Recanalisation**
 - 0.018 Advantage wire (TERUMO)
 - Back-up Halberd 0.018" Halberd wire (ASAHI)
3. **Support catheter**
 - 0,018" Carnelian support catheter 90 cm
4. **Vessel preparation**
 - 3 x 200 mm Passeo 18 (BIOTRONIK)
5. **PTA**
 - 5 x 120 Passeo 18 LUX (two balloons) (BIOTRONIK)
6. **Stenting on indication**
 - Pulsar 18 T3 as a bail-out stent if needed (maximum length 200 mm) (BIOTRONIK)
7. **Manual compression due to 4F devices only**

Case 09 – ZUE 01: female, 38 years (B-5)

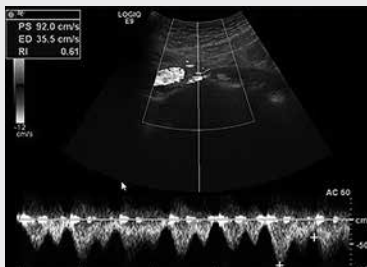
Pelvic congestion syndrome

Operators: N. Kucher, D.-D. Do, F. Baumann

Clinical data: Left lower abdominal pain radiating to left proximal thigh;
aggravated by menstrual cycle
Painful varicose veins vulva and left thigh
Left-sided venous claudication

Imaging: Ultrasound & MR findings:
- May-Thurner compression
- Retrograde flow left internal iliac vein
- No evidence for nutcracker anatomy
- Left pudendal vein feeding varicose thigh veins

- Procedural steps:**
1. Local anesthesia left groin, supine position
 2. Ultrasound-assisted venous access (common femoral vein), insertion 10F sheath
 3. Phlebography / IVUS
 4. Sinus obliquus stent (OPTIMED)



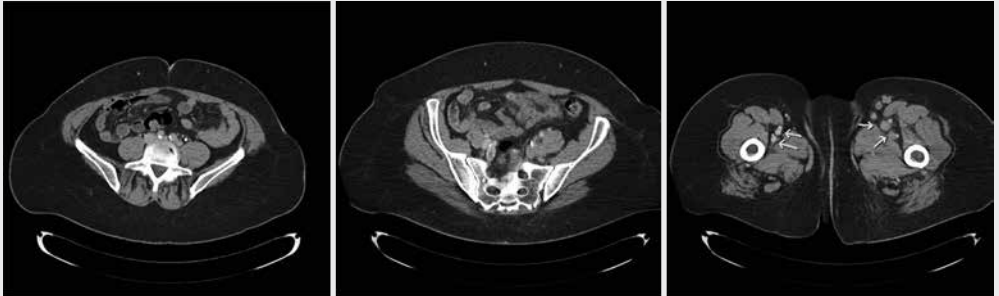
Case 10 – GAL 01: female, 54 years (P-C)

Acute left leg DVT

Operators: J. Ward, G. O'Sullivan

Clinical data: 54 year old lady, normally fit and well, acute onset left leg pain – actually started in the groin, moved inferiorly, went to see family doctor in am; immediately referred to radiology

Imaging: US scan shows acute left leg DVT, CTPA clear, CTV images to follow



Procedural steps:

1. Prone, 10F sheath
2. Initial very gentle venography – 10 cc of dilute contrast
3. IVUS, then stiff glide wire (MERIT MEDICAL) into IVC
4. Deploy VETEX (VETEX MEDICAL) thrombectomy device, cranial to caudal action x 2
5. Aspiration – 8F 55 cm Hockey Stick (CORDIS) +/- 7F 90 cm destination catheter (TERUMO)
6. IVUS to identify remaining thrombus v underlying lesion
7. Balloon angioplasty BARD/BD Atlas 14 mm diameter, 60 mm long; to 14 atm for 14 seconds
8. Stents 14 – 16 mm diameter (BARD/BD Venovo, or COOK Zilver Vena or MEDTRONIC ABRE or VENITI Vici or OPTIMED Sinus Venous)
9. Balloon angioplasty BARD/BD Atlas 14 mm diameter, 60 mm long; to 14 atm for 14 seconds
10. IVUS and one final venogram



Case 11 – LEI 06: female, 59 years (M-P)**Chronic occlusion of the abdominal aorta, Leriche-Syndrome****Operators:** A. Schmidt, M. Ulrich**Clinical data:** PAOD Rutherford 5 left, ulceration Dig. 5 left, ABL right 0.22, left 0.33
Severe claudication both calves, absolute walking capacity 30–50 meters**Risk factors:** Art. hypertension, diabetes mellitus type 2, nicotine abuse (35PY)**CT:** Chronic, thrombus-containing occlusion of the infrarenal aorta and severe stenosis both iliac arteries**Procedural****steps:****1. Transbrachial approach**

- 6F 90 cm Check-Flo performer sheath (COOK)
- 5F 125 cm diagnostic Judkins Right catheter (CORDIS/CARDINAL HEALTH)
- SupraCore 300 cm 0.035" guidewire (ABBOTT)

2. Passage of the occlusions

- Stiff angled 0,035" guidewire, 260 cm (TERUMO)
- Together with 5F 125 cm Judkins Right catheter

3. Bilateral groin access

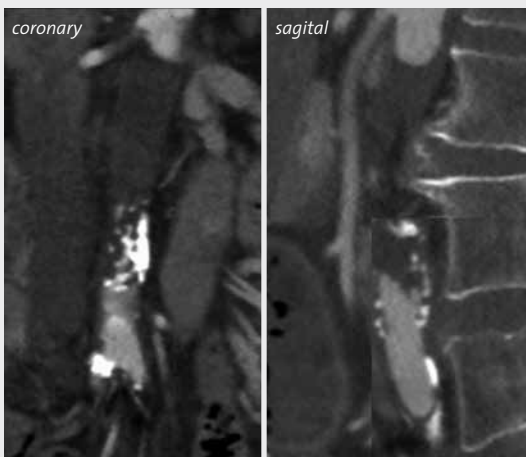
- 7F 10 cm Radiofocus sheath (TERUMO)
- Snaring of the antegrade guidewire from above into the groin-sheath or
- Into 6F-Judkins-Right

4. PTA/thrombectomy via the groin access bilateral

- Rotarex 10F thrombectomy (STRAUB MEDICAL)
- SupraCore 300 cm 0,035" guidewire (ABBOTT)
- Admiral balloon 6.0/120 mm bilateral (MEDTRONIC)

5. Implantation of covered stents

- VBX covered stents for both renal arteries (GORE)
- VBX covered stents bilateral in kissing technique (GORE)



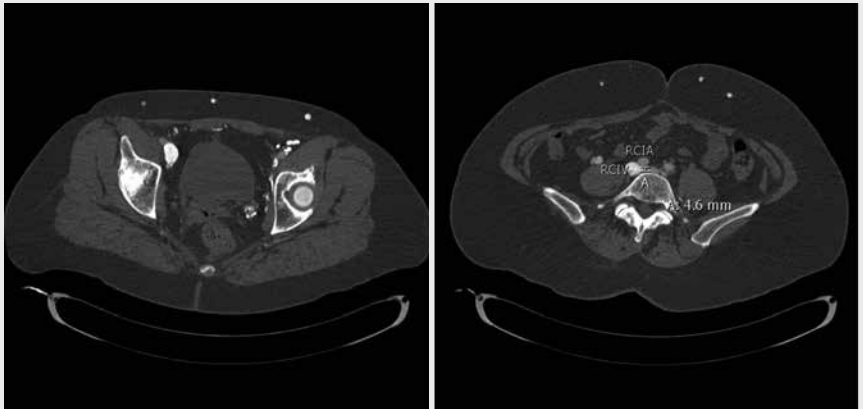
Chronic post thrombotic syndrome left leg

Operators: J. Ward, G. O’Sullivan

Clinical data: DVT x 3; Factor V Leiden deficiency; venous claudication on hills at 50 m; weight gain 9 kg, no ulcers, minimal oedema when wearing stockings; fully anticoagulated

Risk factors: Factor V Leiden

- Procedural steps:**
1. 3 point access RIJ, L FV, R CFV
 2. General anaesthetic, urethral catheter
 3. Full anticoagulation
 4. Cross lesion using multiple obliques – Cxi (COOK), Rubicon (BSCI); Roadrunner wire (COOK)
 5. IVUS to confirm position and to confirm dominant inflow inferiorly
 6. Balloon angioplasty – Atlas high pressure (BARD/BD) – straight to 14 mm @ 14 atm for 14 s minimum
 7. Stents 14 – 16 mm diameter (COOK Zilver Vena or MEDTRONIC ABRE or VENITI Vici or OPTIMED Sinus Venous or BARD Venovo)
 8. Balloon angioplasty – Atlas high pressure (BARD/BD) – straight to 14 mm @ 14 atm for 14 s minimum
 9. IVUS to confirm full stent expansion
 10. One final venogram to show rapid flow



Case 13 – ZUE 02: male, 66 years, (P-vM)

Heart failure and post-thrombotic syndrome

Operators: N. Kucher, D.-D. Do, F. Baumann

Clinical data: High-risk PE requiring CPR and systemic thrombolysis following hernioplasty, 03/2019
Complications: active retroperitoneal bleeding, sepsis, renal failure, IVC Optease filter thrombosis with massive bilateral DVT of entire deep veins below the IVC filter
Current medical condition: Dyspnea NYHA II-III, post-thrombotic syndrome with permanent leg swelling and venous claudication (particularly left side)

Imaging: Echocardiography 11/2019: Normal LV function, normalized RV size and function, no indirect signs of pulmonary hypertension
Ultrasound 11/2019 and Chest-CT 07/2020: Patent common femoral veins, patent external iliac veins, post-thrombotic common iliac veins, occluded infrarenal IVC, patent suprarenal IVC

Present state: Cardiopulmonary exercise test 11/2019: Max VO₂: 53%

- Procedural steps:**
- 1. General anesthesia, urinary catheter, supine position**
 - 2. Ultrasound-assisted access from:**
 - bifemoral
 - common femoral vein: left 10F sheath, right 16F sheath
 - right jugular vein
 - 10F sheath
 - 3. Angioplasty of iliac veins and infrarenal IVC**
 - 4. Extraction Optease Filter**
 - 5. Reconstruction IVC and iliac veins**
 - Venovo stents (BARD/BD)



Case 14 – GAL 03: female, 52 years

End stage renal disease

Operator: J. Ward

Clinical data: On Haemodialysis through a left arm AV fistula
Recurrent episodes of prolonged bleeding and poor flows at dialysis

- Procedural steps:*
1. **Left arm access**
 2. **Initial venography**
 3. **3000 I IV Heparin**
 4. **Crossing of the lesion**
 5. **Wire placement in IVC**
 6. **9F sheath**

Case 15 – ZUE 03: female, 43 years (S-K)

Pelvic congestion and post-thrombotic syndrome

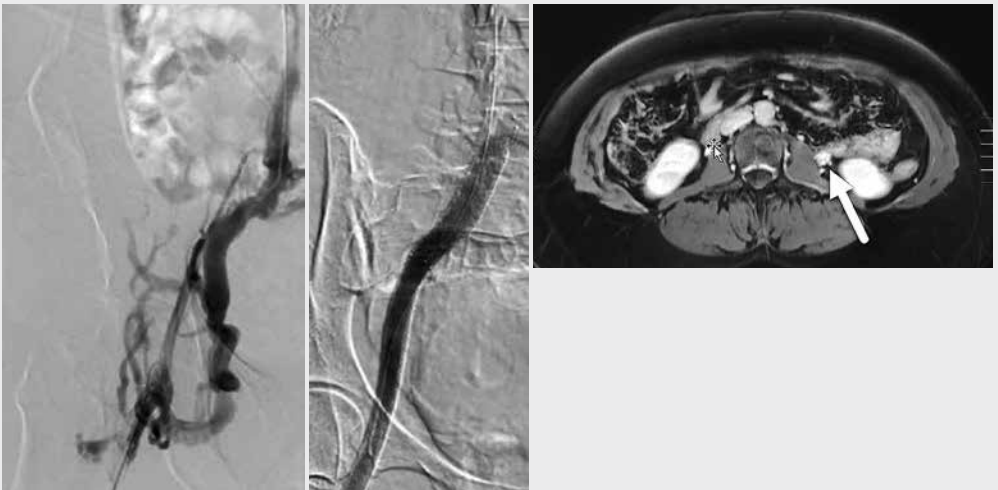
Operators: N. Kucher, D.-D. Do, F. Baumann

Clinical data: Pregnancy-induced right-sided iliofemoral DVT 01/2018
Conservative treatment with LMWH and compression stockings
Persistent venous claudication and leg swelling as well as lower abdominal pain with aggravation during menstruation cycle
Endovascular reconstruction of right ilio-femoral veins 11/2019 using Venovo & BlueFlow stents

Present state: Follow-up in outpatient clinic 12/2019:
Leg symptoms completely resolved
Lower abdominal pain unchanged

Imaging: Duplex: confirmed patency of venous stents
MR-imaging: enlarged ovarian veins

- Procedural steps:**
1. **Local anesthesia right jugular vein, supine position**
 2. **Ultrasound-assisted access**
 - 5F sheath
 3. **Venography of ilio-femoral stents**
 4. **Selective Valsalva venography left ovarian and parauterine veins**
 - 5F Kobra catheter (COOK)
 5. **Selective injection of Aethoxysclerol (3%) foam to parauterine veins during Valsalva**
 6. **Coil embolization of left ovarian vein**
 - Nester 12 mm coils (COOK)
 7. **Final venogram to confirm ovarian vein occlusion**



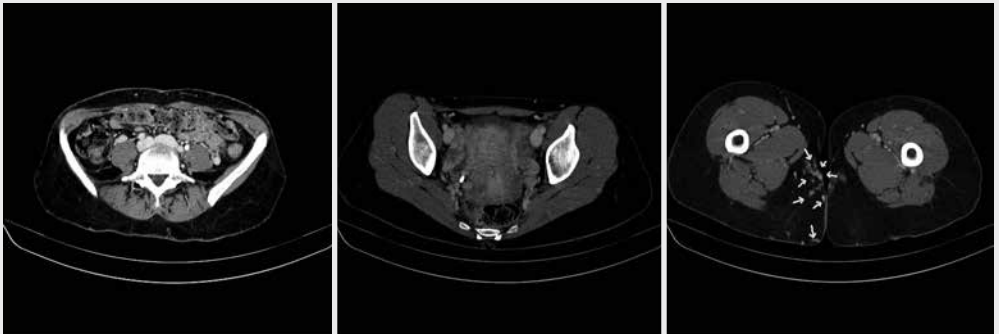
Pelvic vein embolisation

Operators: J. Ward, G. O'Sullivan

Clinical data: 43y year old lady, 4 children all by vaginal delivery; youngest child is 8. Chronic pelvic pain; has been investigated by gynaecologist, gastro-enterologist, pelvic floor specialist, and eventually referred to IR after a CT abdomen pelvis

Imaging: CT and MR show dilated gonadal veins, a possible left common iliac vein compression, and marked para-uterine varices

- Procedural steps:**
1. General anaesthetic, urethral catheter
 2. Right neck access, 10F 23 cm sheath
 3. 5F 100 cm MERIT Impress Cobra catheter into left renal vein
 4. Ideally "loop-the loop" into right ovarian vein
 5. Coils (Pushable, COOK) and Foam (STD, 1% diluted 3:1) to gonadal veins and para-uterine veins
 6. IVUS to accurately delineate the L CIV compression – if necessary stent it although I rarely find this in association with Pelvic Varices



Case 17 – BG 03: male, 82 years (P-R)

Symptomatic high-risk carotid artery disease

Operators: F. Castriota, A. Micari

Clinical data: No relevant prior vascular history
One month ago transient ischemic attack with left-sided hemiparesis

Risk factors: Hypertension, hypercholesterolemia

Imaging: DUS: 85% RICA stenosis with significant flow acceleration
CT angio: sub-occlusive right ICA disease with presence of thrombus

Procedural steps:

1. **Right femoral access (9F)**
2. **Selective right carotid cannulation**
 - JR4 guiding catheter (CORDIS/CARDINAL HEALTH)
3. **Proximal protection**
 - MOMA 9F (MEDTRONIC)
4. **Lesion crossing**
 - 0.014" guidewire
5. **Direct stenting**
 - C-Guard double mesh stent (INSPIRE MD)
6. **Postdilatation**
 - 5.0 mm Ultrasoft balloon (BOSTON SCIENTIFIC)
7. **Debris aspiration (if any)**

Case 18 – BLN 02: male, 79 years (W-G)

Progressive carotid artery stenosis left, high grade bilateral vertebral stenosis

Operators: R. Langhoff, A. Behne

Clinical data: Stenting of the right carotid artery in 2007 without any restenosis
Known carotid artery stenosis on the left side with rapid progression within 6 months from 60 to 80%

Risk factors: Art. hypertension, hypercholesterinemia

Duplex: PSVR >4 m/s left ICA, no restenosis in the right CAS

Procedural steps:

1. **Transfemoral access**
 - short 8F TERUMO sheath right
2. **Selective engaging of the left CCA**
 - Weinberg Catheter (COOK)
3. **Teleskoping of the left ECA**
 - Stiff guidewire 260 cm, angled tip (TERUMO)
 - 8F Vista Brite TIP IG MP shape guiding catheter (CORDIS)
4. **Distal protection**
 - Filterwire EZ (BOSTON SCIENTIFIC)
5. **Predilatation**
 - Maverick 3.0 x 20 mm balloon (BOSTON SCIENTIFIC)
6. **Stenting**
 - 8x25 mm Roadsaver Micromesh stent (TERUMO)
7. **Postdilatation**
 - 5 x 20 mm Emerge balloon (BOSTON SCIENTIFIC)
8. **Postprocedural DAS**
9. **Vessel closure**
 - Angioseal 8F (TERUMO)



Case 19 – BLN 03: male, 59 years (T-S)

Multifocal SFA lesions and popliteal occlusion, left

Operators: R. Langhoff, D. Hardung

Clinical data: Stenting of a left side, high-grade CIA stenosis in 2019
Still dramatically impaired walking distance due to popliteal occlusion
ABI: 0.5 left, ABI: 0.9 right

Risk factors: Arterial hypertension, smoking, hyperlipidemia

Imaging: Duplex and Angio show popliteal occlusion and SFA stenosis

Procedural steps:

1. **Antegrade access**
 - 6F short Prelude Introducer sheath (MERIT MEDICAL)
2. **Wire passage**
 - 0.018" Advantage wire (TERUMO)
 - Backup: Halberd wire 0.018" or 0.014" (ASAHI)
3. **Support catheter**
 - Carnelian 0.018" (BIOTRONIK)
4. **Predilatation**
 - 3 x 150 mm PTA balloon (vessel preparation)
5. **PTA in the SFA and popliteal**
 - Sequent OTW 5 x 150 mm balloon (B.BRAUN)
6. **Focal/spot stenting of SFA and Popliteal artery**
 - Multi-LOC Stent as needed (6 stents maximum) (B.BRAUN)
or using the new 2-LOC
or 3-LOC in 30 or 40 mm
length as a focal stent
7. **Postdilatation with a standard PTA balloon**
8. **Vessel closure**
 - Angioseal 6F (TERUMO)



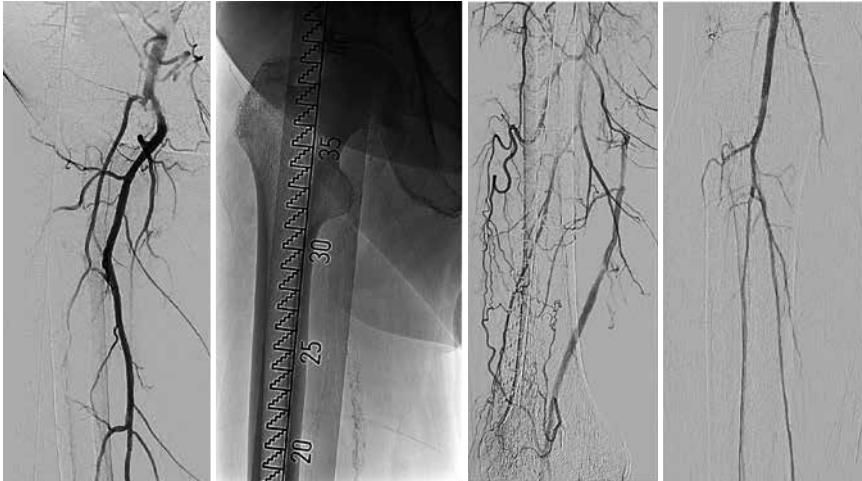
Case 20 – LEI 07: male, 68 years, (V-S)

CTO of the proximal SFA right

Operators: M. Ulrich, A. Fischer

Clinical data: PAOD Rutherford 3 right, walking capacity 150m
DCB-PTA right 11/2017, ABI right 0.66
Multiple interventions left SFA (stent, PTA, DCB) COPD

Risk factors: Arterial hypertension, hyperlipidemia, nicotin abuse (50PY)



Procedural steps:

1. **Left groin retrograde and cross-over approach**
 - 0.035" SupraCore guidewire 190 cm (ABBOTT)
 - 7F 40 cm Balkin Up&Over sheath (COOK)
2. **Passage of the occlusion right SFA**
 - 0.035" Radiofocus angled stiff guidewire, 260 cm (TERUMO)
 - 0.035" CXC support catheter, 135 cm (COOK)

In case of failure guidewire passage from antegrade:
3. **Retrograde approach via distal SFA**
 - 7 cm 21 Gauge needle (COOK)
 - 0.018" V-18 Control guidewire, 300 cm (BOSTON SCIENTIFIC)
 - 4F 10 cm Radiofocus introducer (TERUMO)
 - Pacific Plus 4.0/40 mm balloon, 90 cm (MEDTRONIC)
4. **Vessel preparation**
 - Pacific 2.0/120 mm balloon (MEDTRONIC)
 - VascuTrak 5.0/120 mm balloon (BARD/BD)
5. **Stenting on indication**
 - 5 mm or 6 mm Biomimics 3D stent (VERYAN MEDICAL)

Case 21 – BG 04: female, 69 years, (A-M)

Symptomatic right carotid artery disease in a patient with known history of cardiovascular disease

Operators: F. Castriota, A. Micari

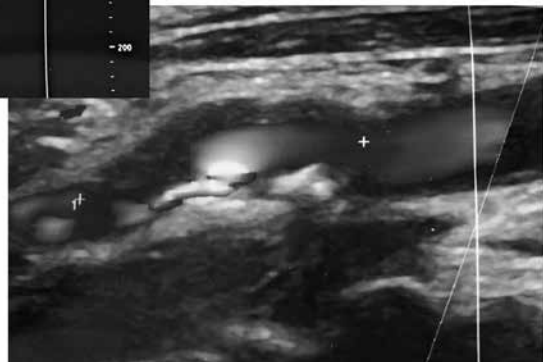
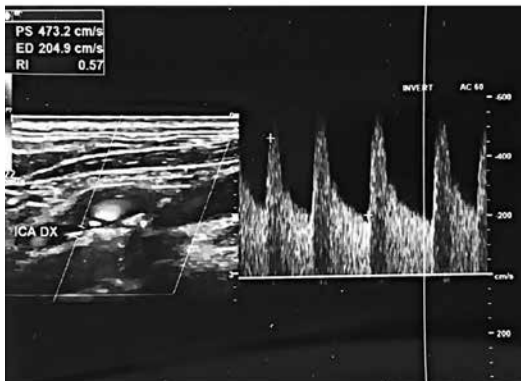
Clinical data: Previous CABG (LIMA to LAD, VG to posterolateral branch) + ascending aorta repalcement (2015)
Previous multiple PCI (the last one in 2017 to LCx artery)
Currently asymptomatic for angina, negative stress echo in 2019
In December 2019 episode of left-sided hemiparesis with full neurological recovery

Risk factors: Hypertension, hypercholesterolemia

Imaging: DUS: severe right carotid artery stenosis with flow acceleration up to 473 cm/sec

Procedural steps:

1. **Radial access (6F)**
2. **Right carotid artery selective cannulation**
 - IM guiding catheter
3. **Support guidewire**
 - 0.035" Supracore wire in ECA
4. **Sheath placement**
 - Destination 6F long 90 cm sheath (TERUMO)
5. **Filter placement**
 - Spider FX filter (MEDTRONIC) in RICA
6. **Direct stenting**
 - Roadsaver double mesh stent (TERUMO)
7. **Postdilatation**
 - 5.5 mm Ultraverse balloon (BOSTON SCIENTIFIC)



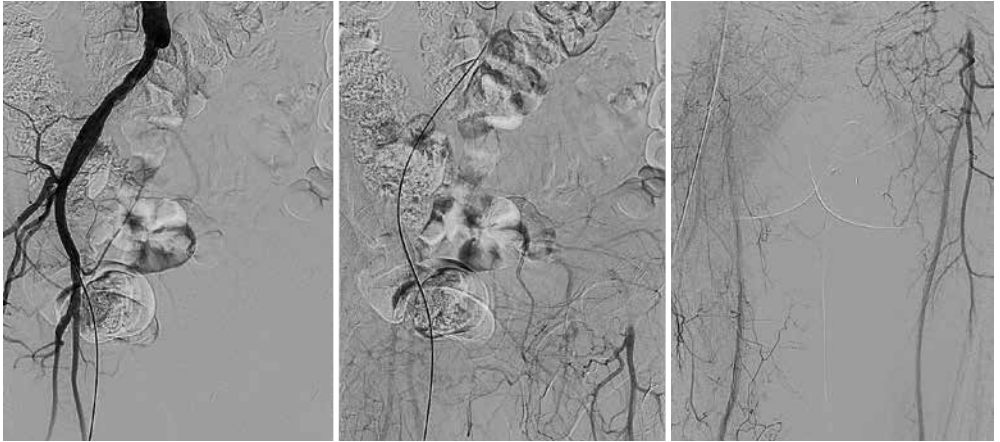
Case 22 – LEI o8: female, 55 years (B-A)

Total occlusion of the left CIA and EIA

Operators: S. Bräunlich, M. Ulrich

Clinical data: PAOD Rutherford 3, claudication left calf, walking capacity 50m, ABI left 0.45

Risk factors: Arterial hypertension, hyperlipidemia, nicotine abuse (35PY)



Procedural steps:

1. Left femoral access

- 7F 25 cm Radiofocus Introducer (TERUMO)
 - 0.035" SupraCore guidewire 300 cm (ABBOTT)
- Left brachial approach:
- 6F 90 cm Check-Flo Performer (COOK)

2. Antegrade and retrograde guidewire passage

brachial:

- 5F Judkins Right diagnostic catheter 125 cm (CORDIS/CARDINAL HEALTH)
- from femoral:

- 5F Multipurpose diagnostic catheter 80 cm (CORDIS/CARDINAL HEALTH)
- 0.035" stiff angled glidewire, 260 cm (TERUMO)

3. Predilatation and stenting of the aorto-iliac bifurcation

- Ultraverse or Dorado balloon (BARD/BD)
- LifeStream covered stent 8/58 mm bilateral common iliac arteries in kissing-technique (BARD/BD)
- Covera Plus vascular covered stent for the external iliac artery (BARD/BD)

Case 23 – BG 05: male, 69 years (G-Z)

Severe right leg claudication in a patient with history of heavy smoking

Operators: F. Castriota, A. Micari

Clinical data: Previous coronary angiogram (abnormal stress test) showing unobstructed coronary arteries
Severe right leg claudication (90 m) much impairing quality of life
Quit smoking 1 year ago

Risk factors: Mild hypertension, dyslipidemia

Imaging: DUS: flow demodulation in right CFA compatible with iliac occlusion
Angio MRI: right distal common iliac occlusion

Procedural steps:

1. **Left femoral access (6F)**
2. **Cross-over approach**
 - 45 cm Destination sheath (TERUMO)
3. **Right femoral access**
 - Back-up, 4F sheath
4. **Lesion crossing from cross-over system**
 - 0.018" Control wire or hydrophilic 0.035" wire (TERUMO)
5. **Predilatation**
6. **Stenting with self-expandable stent**
 - Everflex (MEDTRONIC)
7. **Postdilatation**



LEIPZIG
INTERVENTIONAL
COURSE
2020

L I N C

Wednesday,
January 29, 2020

Wednesday

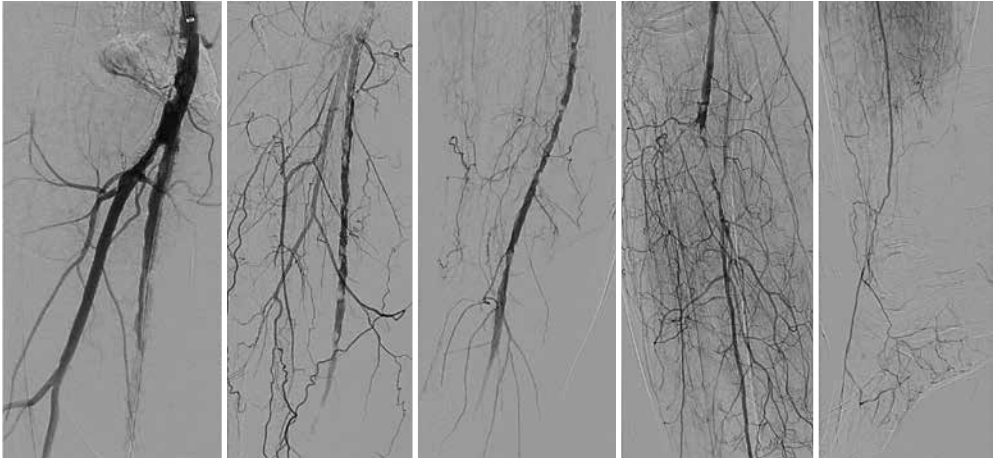
Case 24 – LEI 09: male, 64 years (G-C)

Complex BTK-CTO right in a CLI-patient

Operators: A. Schmid, M. Ulrich

Clinical data: Critical limb ischemia, minor gangrene dig 1 right, restpain and severe claudication right, ABI right 0.4
PTA/atherectomy right SFA and left popliteal artery 12/19, CAD, CABG 10/2015

Risk factors: Arterial hypertension, diabetes mellitus type 2 with multiple complications, smoker, hyperlipidemia



Procedural steps:

1. **Antegrade approach right groin**
 - 6F 55 cm sheath (COOK)
2. **Guidewire passage antegrade into peroneal artery and second into tibial anterior artery**
 - 0.014" Command (ABBOTT)
 - 0.014" PT2 guidewire 300 cm (BOSTON SCIENTIFIC)

In case of failure: retrograde approach
3. **Vessel preparation**
 - Orbital atherectomy system Stealth 360° Peripheral OAS (CSI)
4. **PTA with DCBs**
 - AcoArt-Litos 2.0/200 mm (ACOTEC)

Case 25 – LEI 10: male, 77 years (N-B)

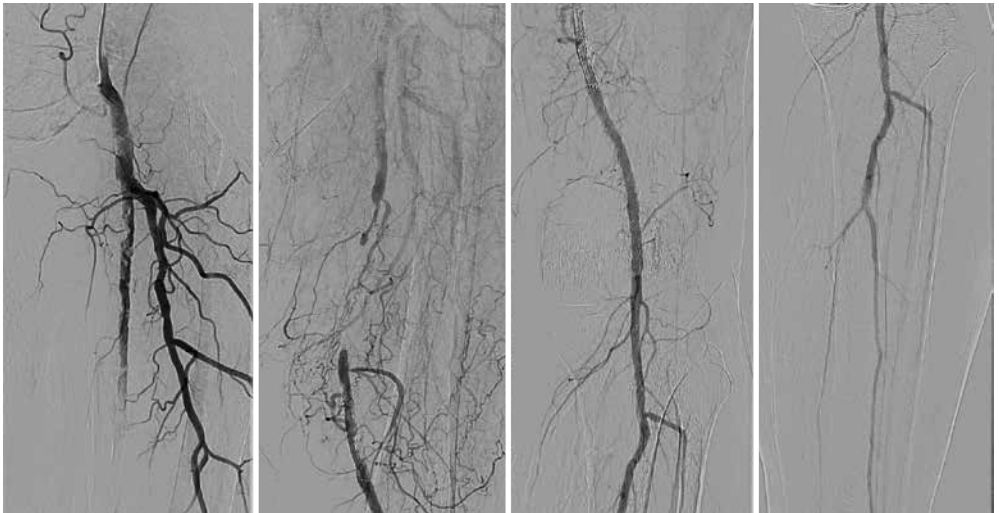
Calcified SFA-occlusion left

Operators: S. Bräunlich, A. Fischer

Clinical data: PAOD Rutherford class 3, severe claudication left, walking capacity 50 m, ABI 0.5 multiple interventions both SFA

Risk factors: Arterial hypertension, hyperlipidemia

- Procedural steps:**
1. **Right femoral retrograde and cross-over approach**
 - 7F 55 cm Check-Flo Performer, Raab Modification (COOK)
 2. **Passage of the occlusion left SFA**
 - 0.018" V-18 or Victory guidewire (BOSTON SCIENTIFIC)
 - 0.018" Rubicon support catheter (BOSTON SCIENTIFIC)
 3. **Guidewire passage and filter placement**
 - 0.018" V-18 Control guidewire, 300 cm (BOSTON SCIENTIFIC)
 4. **Atherectomy**
 - 2.4/3.4 mm JetStream atherectomy device (BOSTON SCIENTIFIC)
 5. **PTA with DCBs and/or stenting**
 - Ranger DCB balloon (BOSTON SCIENTIFIC)
 - Eluvia drug-eluting stent (BOSTON SCIENTIFIC)



Case 26 – PAR 01

**For case information
please download the LINC 2020 App
or visit the LINC 2020 website.**

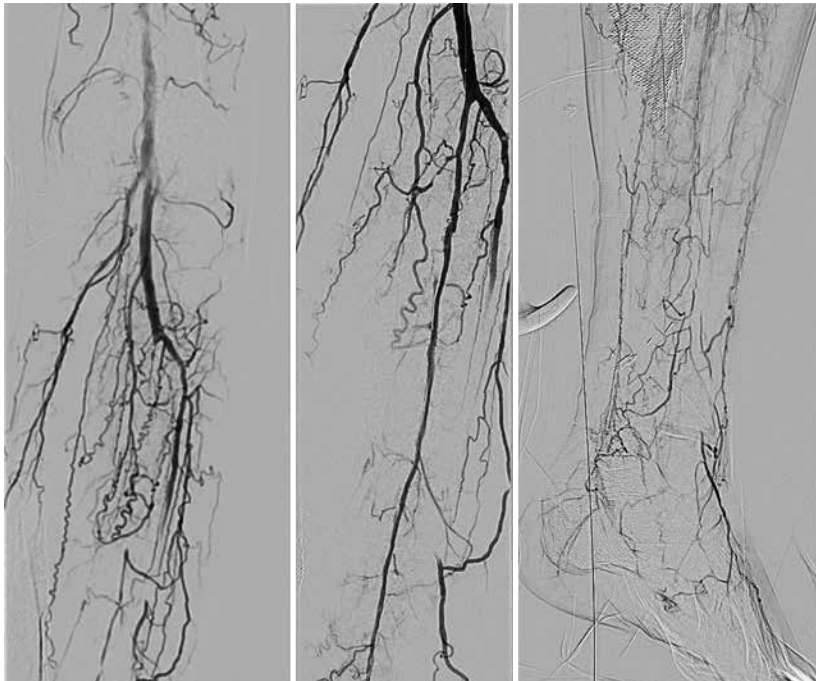
Occlusion left tibial anterior artery, CLI

Operators: A. Schmidt, A. Fischer

Clinical data: PAOD Rutherford 5, non-healing forefoot ulcerations, severe claudication left, walking capacity 20 m, ABI left 0.2
PTA left peroneal artery 12/19 with no clinical improvement

Risk factors: Arterial hypertension, hyperlipidemia, diabetes mellitus

- Procedural steps:**
1. **Antegrade access left groin**
 - 6F 55 cm Check-Flow Performer (COOK MEDICAL)
 2. **Guidewire passage anterior tibial artery**
 - 0.014" Command (ABBOTT)
 - 0.014" PT2 guidewire 300 cm (BOSTON SCIENTIFIC)
 - In case of failure: retrograde approach
 3. **Vessel preparation**
 - 2.5/100 m Amphirion Deep balloon catheter (MEDTRONIC)
 4. **PTA with Sirolimus coated balloon**
 - 3.0/40 mm MagicTouch SCB balloon (CONCEPT MEDICAL)
 5. **Stenting on indication**
 - Tack Endovascular System (INTACT VASCULAR)



Case 28 – JEN 01

**For case information
please download the LINC 2020 App
or visit the LINC 2020 website.**

Case 29 – KGP 01: male, 76 years (G-S)

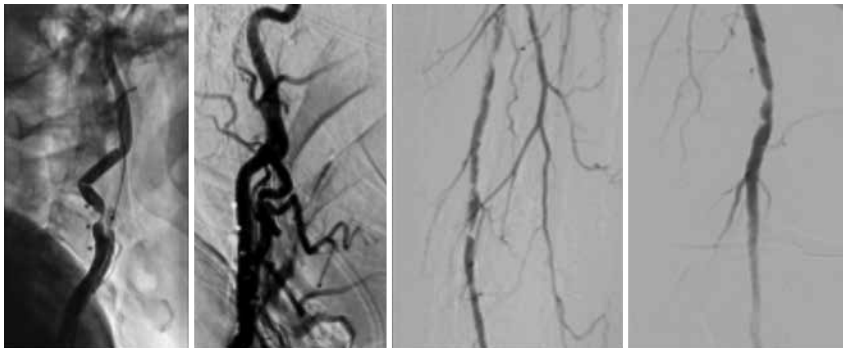
Left SFA and popliteal stenosis

Operators: D. C. Metzger, M. Aziz

Clinical data: Severe claudication @ 50' despite medical therapy
ABI 0.59 left at rest
History of RICA stent 2018 for severe symptomatic RICA stenosis

Risk factors: CAD with CABG, former tobacco, Htn, NIDDM, dyslipidemia

- Procedural steps:**
1. **Contralateral access**
 - 7F Ansel sheath (COOK)
 2. **NAV6 Distal embolic protection (ABBOTT)**
 3. **Jetstream atherectomy (BOSTON SCIENTIFIC)**
 4. **DCB**
 5. **Provisional interwoven stenting**



Case 30 – KGP 02: male, 66 years (R-M)

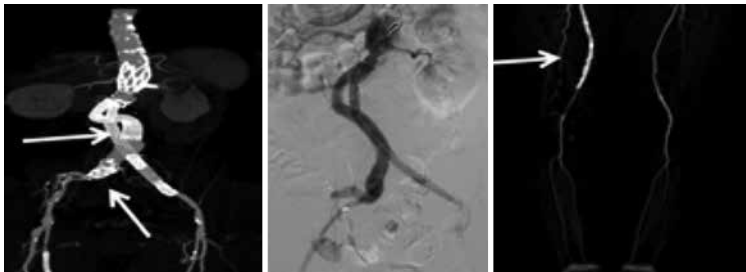
R SFA ISR CTO with difficult access

Operators: D. C. Metzger, M. Aziz

Clinical data: ABI 0.56 R at rest, drops to 0.39 with exercise
CTA: R SFA stents occluded; R EVAR limb disarticulated with AAA 7.1 cm
Severe claudication @ 50-100' on maximal medical therapy

Important items: – History of L renal stent 9/15
– History of 3 stents long R SFA CTO 10/15 (2 5.5 mm Superas, one nitinol stent)
– History of EVAR 10/15 for 5.3 cm AAA Ovation); CTA 12/15 good; then lost to follow up
– Returned because of claudication; CTA dirupted limb, 7.1 cm AAA (fixed)

Risk factors: Former smoker, Htn, dyslipidemia, + FHx



Procedural steps:

1. **Antegrade access R CFA**
2. **CTO crossing**
 - Navicross and 0.035 angled glidewire
3. **Distal embolic protection**
 - NAV6 (ABBOTT)
4. **Atherectomy**
 - Jetstream (BOSTON SCIENTIFIC) or Laser (PHILIPS)
5. **DCB angioplasty**
6. **Provisional stent grafting**
 - Viabahn (GORE)

Case 31 – LEI 12: female, 74 years (S-P)

Long SFA-occlusion right in a CLI-Patient

Operators: A. Schmidt, A. Fischer, S. Düsing

Clinical data: Critical limb ischemia, minor gangrene dig 1 - 4 right, restpain and severe claudication right, ABI right 0.3
PTA right EIA and CFA 12/19
CAD, stroke 10/2019, COPD, MGUS

Risk factors: Heavy smoker (50PY), arterial hypertension, hyperlipidemia

Procedural steps:

1. **Left femoral access and cross-over approach**
 - 6F 45 cm cross-over sheath Fortress (BIOTRONIK)
2. **Passage of the occlusion right SFA**
 - 0.018" Command guidewire (ABBOTT)
 - 0.018" Carnelian support catheter, 135 cm (BIOTRONIK)

In case of failure guidewire passage from antegrade:
3. **Retrograde approach via distal SFA**
 - 9 cm 20 Gauge spinal needle (BD)
 - 0.018" V-18 Control guidewire, 300 cm (BOSTON SCIENTIFIC)
 - 4F 10 cm Radiofocus introducer (TERUMO)
 - Passeo 18 4.0/40 mm balloon, 90 cm (BIOTRONIK)
4. **PTA**
 - Passeo 18 Ballon 5 x 150 mm (BIOTRONIK)
 - 5 mm Passeo 18 Lux DCB (BIOTRONIK)
5. **Stenting on indication**
 - Pulsar 18-T3 stent (BIOTRONIK)



Case 32 – KGP 03: male, 59 years (G-L)

Severe R CFA and popliteal disease with calcium and ectasia

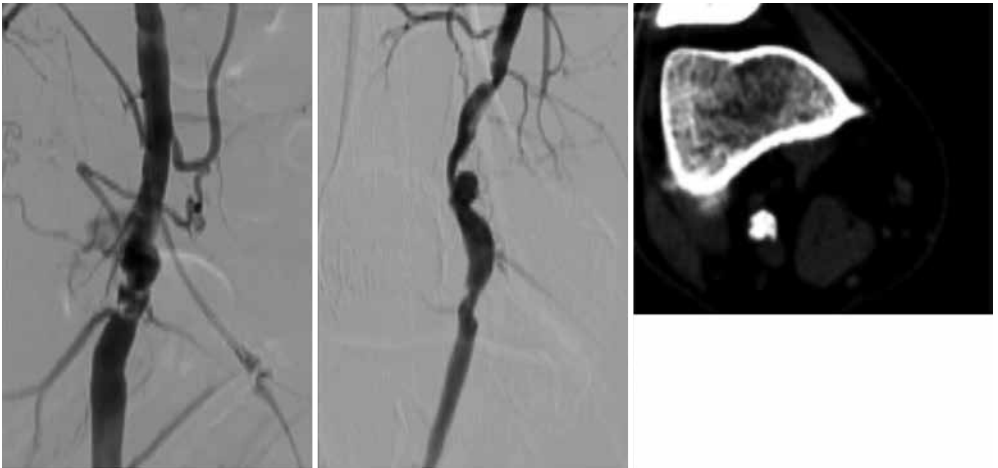
Operators: D. C. Metzger, M. Aziz

Clinical data: R ABI 0.69, drops to 0.40 with exercise
Severe claudication at < 100' on maximal medical therapy

History: Had PVI L SFA and popliteal CTO 12/19 with PTA and Supera 6X150 and 6X120 stents
History of CABG 2015

Imaging: CTA: Heavy calcium and >70% RCFA; Ca++ and 1.7 cm R popliteal 90%
Angiograms during left leg intervention: severe CA++ R CFA and R popliteal disease

Risk factors: Heavy smoker, Htn, NIDDM, dyslipidemia, + FHx



Procedural steps:

1. **Contralateral access**
 - 7F Ansel sheath (Cook)
2. **Placement of distal embolic protection basket**
 - NAV6 (ABBOTT)
3. **IVUS R CFA and popliteal**
4. **Shockwave R popliteal and R CFA (SHOCKWAVE MEDICAL)**
5. **Viabahn stent graft right popliteal (GORE)**
6. **Stenting**
 - Supera stent (ABBOTT) within Viabahn (GORE)
7. **DCB RCFA**

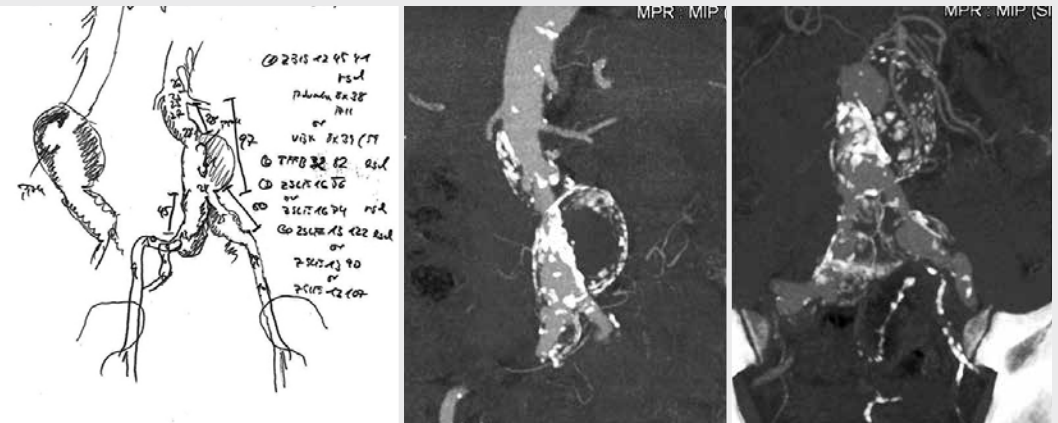
Case 33 – MUN or: male, 80 years (F-H)

EVAR with iliac side branch endografting on the right sides for a aorto-iliac aneurysm 6 cm max.

Operators: M. Austermann, E. Beropoulos, Y. Shehada

Clinical data: CAD - MI 2014 - Stent PTCA 2014, art. hypertension, renal impairment, hostile abdomen after colonic surgery for cancer

Important items: Slight abdominal pain during palpation, irregular morphology, small lumen, occlusion of the left hypogastric artery



Procedural steps:

1. Percutaneous approach both groins
Prostar XL (ABBOTT) 14F (COOK) both groins
2. Placement of the ZBIS 12 45 41 (COOK) on the right side
Catching a stiff wire (TERUMO) through the preloaded catheter with an indy snare (COOK) and build a pull-through wire
3. Placement of a 12F Flexor sheath over the pull through wire
after partial deployment of the IBD insight the hypogastric branch
4. Cannulation of the hypogastric artery (smooth TERUMO wire)
and changing for the Rosen wire (COOK)
5. Placement of the bridging stentgraft Advanta V12 and/or Viabahn (GORE)
down to the posterior division of the IIA
6. Placement of the aortic endograft through the left side, connection with the IBD
by a ZSLE leg and extension of the left limb down to the external iliac artery (COOK)
7. Final angiography and closure of the groins

Case 34 – LEI 13: female, 75 years (R-S)

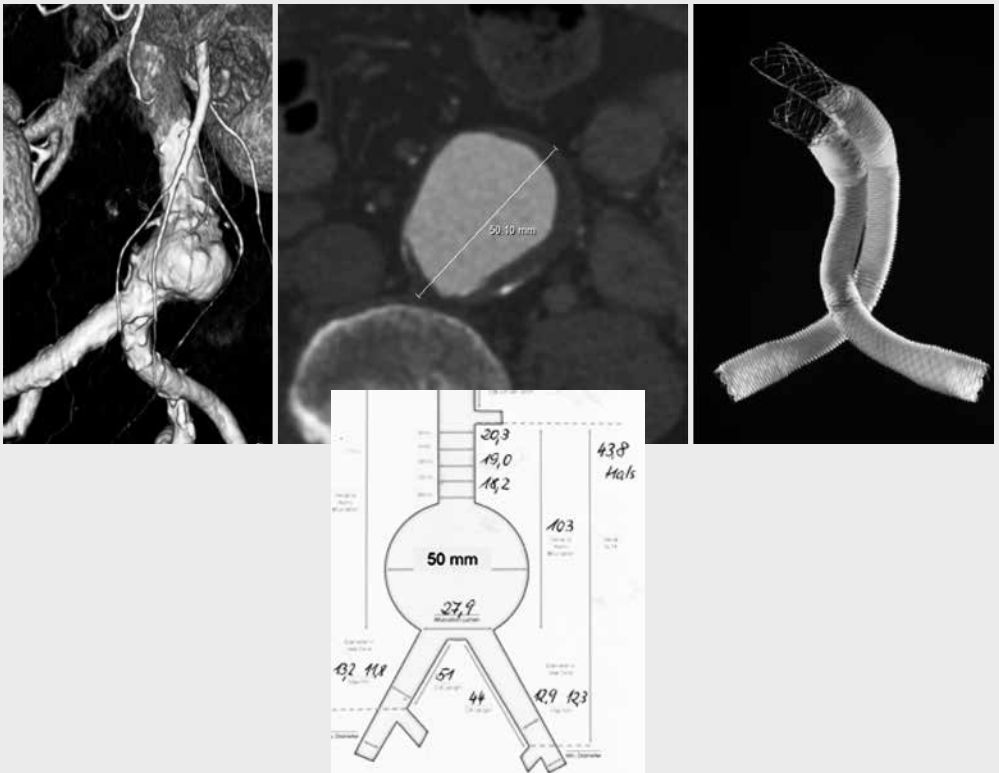
Symptomatic infrarenal aortic aneurysm

Operators: A. Schmidt, J. Rusinovich

Clinical data: Symptomatic infrarenal aortic aneurysm (max. diam. 47 mm)
Occasionally back-pain and abdominal pain

Risk factors: Arterial hypertension, hyperlipidemia

- Procedural steps:**
- 1. Bilateral femoral percutaneous access**
 - Preloading of Proglide-Systems (ABBOTT)
 - 2. Coilembolisation of lumbar segmental arteries before EVAR**
 - IMA 6F guiding catheter (MEDTRONIC)
 - SIM-I 5F diagnostic catheter (CORDIS-CARDINAL HEALTH)
 - 0.014" PT2 guidewire (BOSTON SCIENTIFIC)
 - Progreat Micro Catheter System 2.7F 130 cm (TERUMO)
 - Microvascular Plugs (MEDTRONIC) and Amplatzer Plug for the IMA (ABBOTT)
 - 3. Implantation of stentgraft system**
 - Altura Ultra Low Profile stentgraft system (LOMBARD MEDICAL)



Case 35 – MUN 02: male, 66 years (L-K)

4-BEVAR for a growing thoracoabdominal aneurysm type 4

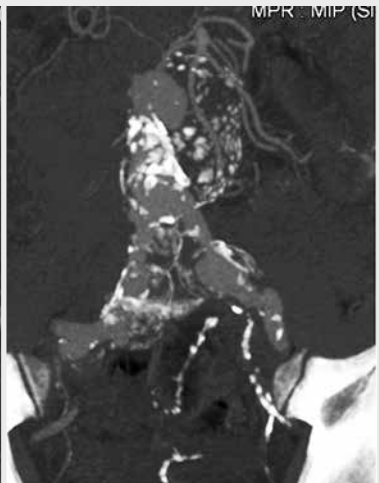
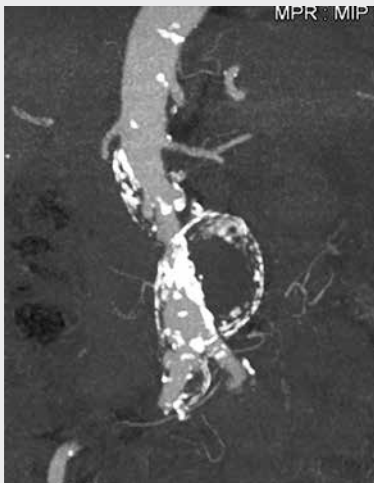
Operators: M. Austermann, E. Beropoulos, Y. Shehada

Clinical data: Arterial hypertension, CAD

Present state: Growing TAAA 4 partial saccular morphology

Procedural steps:

1. Left axillary access 5F sheath via cut down
2. Percutaneous approach (Prostar XL, ABBOTT) 14F (COOK) both groins
3. Lunderquist wire through the right groin
Pig tail catheter through the left groin for imaging
Registration of the Fusion technology
4. Placement of the branched endograft (COOK) with 4 branches by using the Fusion system
5. Placement of the bifurcated graft (COOK) and the iliac extensions
Then closure of the groins to avoid paraplegia
6. Connection of all target vessels through the corresponding branches with covered bridging stentgrafts
7. Closure of the axillary access



Case 36 – LEI 14: male, 62 years (G-H)

Large-neck (>29 mm) abdominal aneurysm

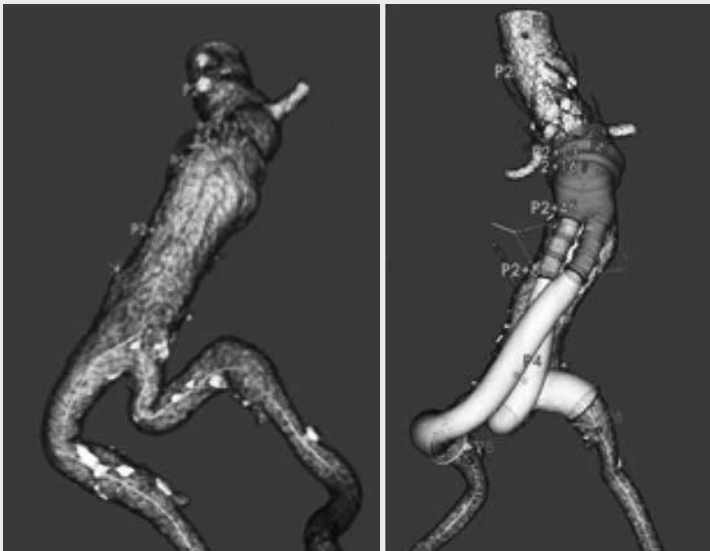
Operators: A. Schmidt, M. Matschuck

Clinical data: Incidental finding of an AAA within a screening-program, max. 60 mm diameter CAD; preemptive coilembolisation of lumbar arteries

Risk factors: Arterial hypertension, former smoker

CT-angio: Neck-morphology: > 29mm diameter, > 60° infrarenal neck-angle
Thrombus-containing; max. diameter of the AAA: 60 mm
Severely angulated and tortuous common iliac arteries

- Procedural steps:**
- 1. Bilateral femoral percutaneous access**
 - Preloading of Proglide-Systems (ABBOTT)
 - 2. Cydar EV intelligent navigation system (CYDAR MEDICAL)**
 - 3. Implantation of an Ovation stentgraft (ENDOLOGIX)**



Case 37 – PAR 02: male, 66 years

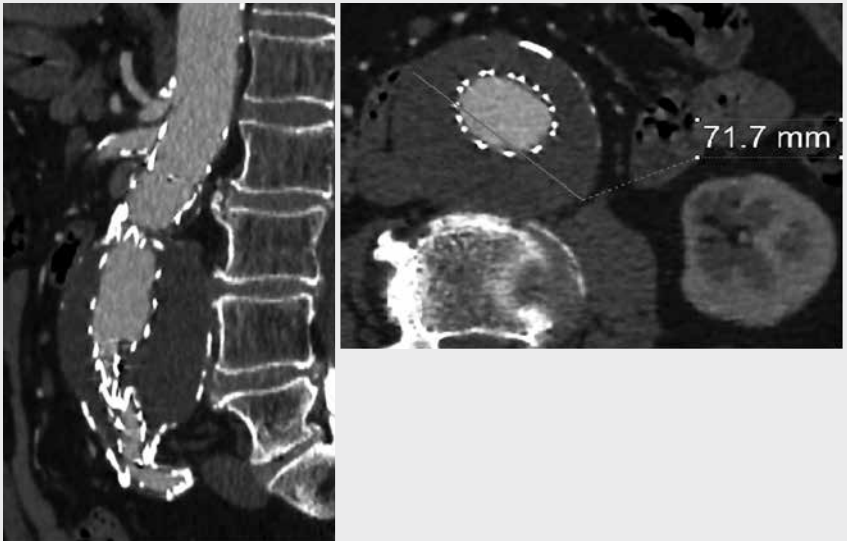
FEVAR for type 1a endoleak post EVAR

Operators: S. Haulon, D. Fabre, A. Girault, P. Charbonneau, A. Schwein

Clinical data: Previous EVAR for AAA

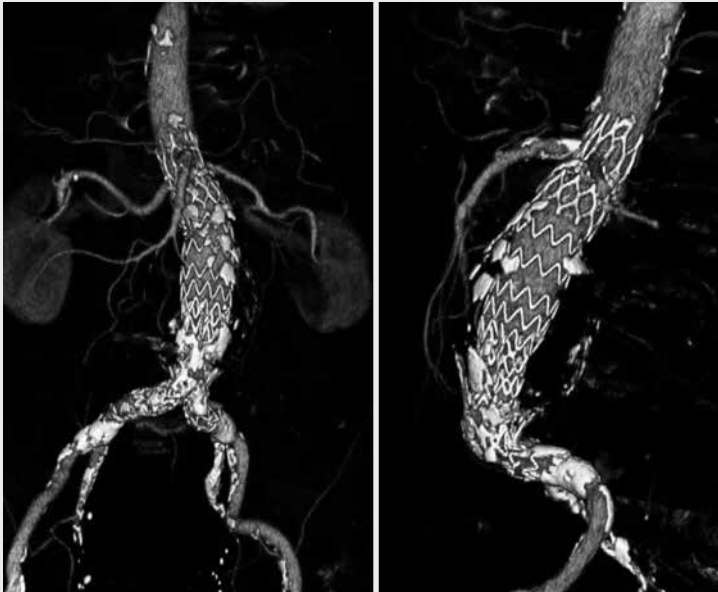
Present state: 71 mm AAA

- Procedural steps:**
1. L: Advance 18F 33cm GORE Dryseal sheath in the LCFA over Lunderquist – 1 x 6F 55 cm and 1 x 7F 55 COOK Ansel sheaths
100 U/kg Heparin (Target ACTfl1250)
L (through one of the 6F): advance long pigtail catheter
R: 10F sheath/Lunderquist/dilators up to 20
 2. Fluoroscopy to locate fenestrations gold markers
R: Advanced fenestrated endograft – Aortic angiogram – fusion mask registration – fenestrated endograft deployment
 3. R: Rosen wire advanced through preloaded catheter – Exchange preloaded catheter for a 6F-90cm COOK Ansel Shuttle sheath – Exchange Rosen for a Stealcore 0.018 - 300 cm wire – Retrieve 6F to the level of the fenestration – Retrieve the 6F dilator – Puncture valve – DAV + Terumo/Roadrunner through 6F for renal artery catheterisation – Renal angiogram – Exchange Terumo for Rosen – Retrieve Stealcore wire – Advance 6F into the renal artery – Advance BENTLEY Begraft bridging stent to parking position
 4. Same for contralateral renal artery



Case 37 – PAR 02

- Procedural steps (cont.):**
5. L: Through 6F sheath advance BER + Terumo to catheterize fenestrated endograft lumen – Advance 6F below the fenestration (SMA/CT) – USL + Terumo/ Roadrunner through 6F sheath to catheterise target vessel (SMA/CT) – Vessel angiogram / Exchange Terumo for Rosen wire – Advance 6F into target vessel – Advance BENTLEY Begraft bridging stent to parking position
 6. R: Release diameter-reducing ties – proximal and distal attachments – Nose retrieval under fluoroscopy
 7. L: SMA/CT stent deployment (3-4 mm protruding in the aortic lumen) after sheath retrieval – Flare the aortic portion of stent with 10-20 mm balloon – Advance the sheath in the SMA/CT stent/angiogram (SMA: exchange Rosen for terumo wire)
 8. R: Renal artery stent deployment (3-4 mm protruding in aortic lumen) after 6F retrieval – Flare the aortic portion of stent with 9-20 mm balloon – Advance 6F back into the renal stent – angiogram
 9. R: Remove nose under fluoroscopy / Remove fenestrated device delivery system
L: Withdraw sheaths in 18F – insert and deploy bifurcated device and iliac limbs
 10. CODA balloon to mold overlaps and distal sealing zones
Pigtail catheter – Angiogram + non-contrast CBCT



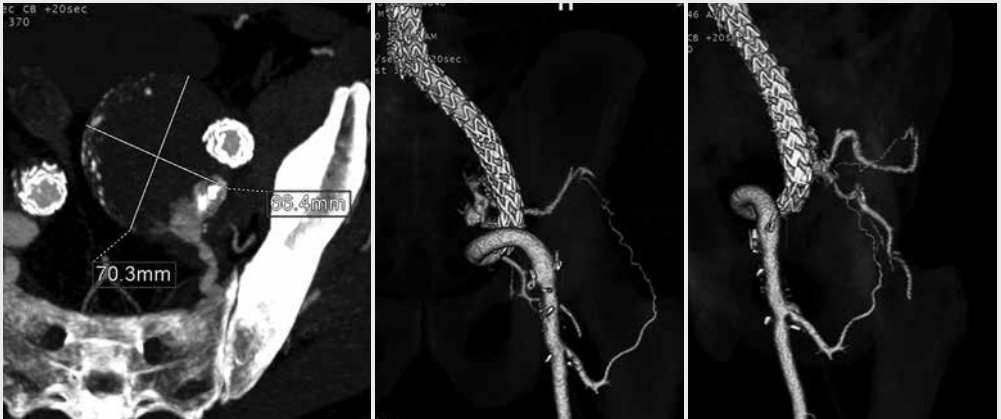
Case 38 – MUN 03: male, 69 years (BF-J)

Growing left hypogastric artery aneurysm due to type II EL

Operators: A. Schwindt, A. Argyriou, A. Sohr

Clinical data: October 2016 emergency EVAR (Endurant MEDTRONIC) for ruptured AAA with overstenting of left hypogastric artery aneurysm, surgical graft interposition for left CFA aneurysm

Present state: Growing of left hypogastric from 5.5 cm 2016 to 70 mm January 2020, CT angiograms show type II EL via left inferior hypogastric artery



Procedural steps:

1. Duplex guided antegrade puncture of proximal left CFA insertion of 5F 10 cm sheath (TERUMO) into profunda artery
2. Cannulation of left internal circumflex artery with 4F Glidecath (TERUMO)
3. Angiography and cannulation of pelvic collaterals to hypogastric aneurysm with 0,014" wire (Connect, ABBOTT) and 0,014" Microcatheter (Echelon, MEDTRONIC)
4. Catheter flush with DMSO and embolization of EL with alcohol copolymer (ONYX, MEDTRONIC)

Case 39 – FRA 01: male, 81 years (K-H)

Percutaneous CT-guided microwave ablation of hepatocellular carcinoma post TACE

Operators: N. Nour-Eldin, B. Panahi

Clinical data: Histologically confirmed HCC lesion in Segment 5
Highly differentiated HCC, no liver cirrhosis
Initial tumor stage: T3 Nx Mo. Etiology NASH, no extrahepatic metastases
3 cycles of TACE were carried out for downsizing

- Procedural steps:**
1. Revision of the previous images for confirmation of the size and location of the lesion
 2. Non contrast enhanced CT of the liver for planning
 3. Surface marking of the location of the lesion as well as the site of puncture on the skin
 4. Sterile covering followed by infiltration of the local anesthetic
Conscious sedation would be given
 5. Stepwise insertion of the Microwave antenna (Covidien® System) within the lesion
 6. The energy required for ablation will be given to induce complete ablation of the lesion
Intermittent CT images to observe the changes during the ablation procedure
 7. After applying the required energy for ablation, needle track ablation will be done followed by removal of the antenna
 8. Transfer of the patient to the recovery room for clinical observation

Case 40 – JEN 02: male, 75 years (K-U)

Holmium 166-SIRT of intrahepatic cholangiocellular carcinoma of the left liver lobe

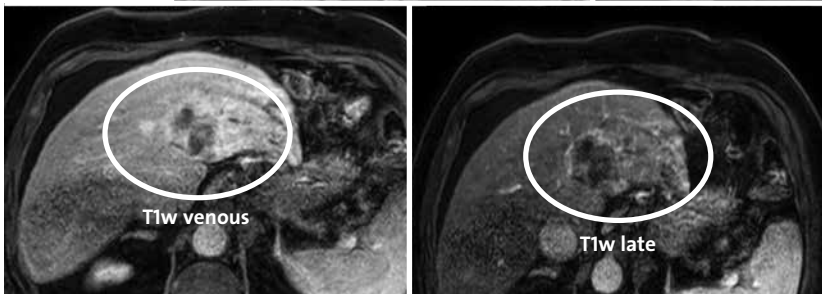
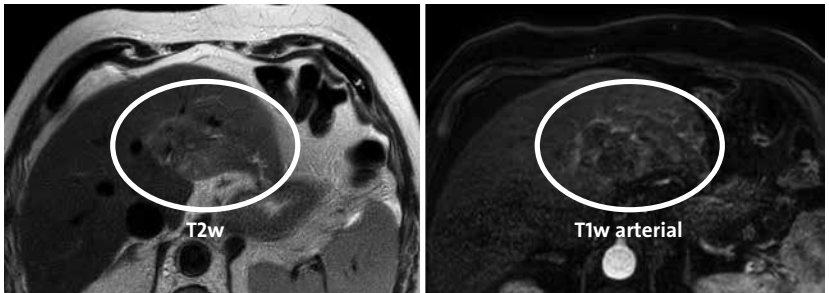
Operators: R. Aschenbach, R. Drescher

Clinical data: iCCC, Grade II of the left lobe, not resectable due to advanced liver fibrosis

Important items: ITB waived at first line therapy resection
 Intra-operative advanced fibrosis
 Liver surgeons stated this as not resectable
 ITB reviewed the case and recommended SIRT
 (probably radio-segmentectomy if possible)

Procedural steps:

1. **Right groin puncture**
 - 5F sheath (TERUMO)
2. **Access to liver**
 - 5F Cobra catheter (BOSTON SCIENTIFIC)
3. **Access to tumor**
 - Microcatheter Progreat (TERUMO)
4. **Application of estimated activity**
 - QuiremSpheres/Holmium 166 (TERUMO)
5. **Vascular closure device of the right groin**
 - Exoseal (CORDIS)



Case 41 – FRA 02: female, 40 years

Uterine artery embolization for fibroids

Operators: N. Nour-Eldin, E. Emará

Clinical data: Heavy menstruation (menorrhagia) accompanied by severe abdominal discomfort during menstruation (dysmenorrhea) due to multiple fibroids
Dysmenorrhia, menorrhagia, presurre symptoms on the urinary bladder and rectum

- Procedural steps:**
1. Performance of contrast enhanced MRA of the pelvic arteries, as a planning imaging modality for assessment of the pelvic vessels and for the evaluation of the uterine fibroids
 2. Puncture of the right femoral artery in Seldinger's Technique followed by application of a 5F sheath
 3. Performance of pelvic angiography using Pigtail catheter
 4. Selective catheterisation of the right uterine artery using sidewinder-1 cath, using microcatheter (Prograde) with superselective demonstration of the right uterine artery
 5. Injection of the Embosphere particles (250-350 microns) through the microcatheter until reaching stasis
 6. Then catheterization of the left uterine artery using sidewinder-1 and prograde microcatheter
 7. Injection of the Embosphere particles (250-350 microns) through the microcatheter until reaching stasis
 8. Removal of the catheters and closure of femoral puncture using angioseal

Case 42 – JEN 03: male, 64 years (H-D)

DEB-TACE of hepatocellular carcinoma HCC of the left lobe

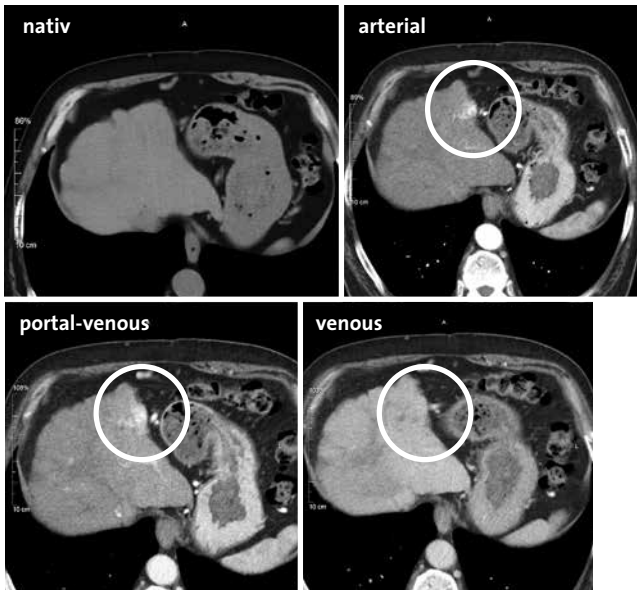
Operators: R. Aschenbach, F. Bürckenmeyer

Clinical data: 22 mm HCC in the left lobe, bridging to transplant, liver cirrhosis Child-PUGH B7, in-side MILAN, no extrahepatic disease, no macrovascular invasion

Imaging: Typical appearance in CT Scan, in-side Milan, no extrahepatic disease

Procedural steps:

1. **Right groin puncture**
 - 5F sheath (TERUMO)
2. **Access to hepatic**
 - 5F Cobra catheter (BOSTON SCIENTIFIC)
3. **Access to feeding vessel**
 - OccluSafe Micro-Catheter (TERUMO)
4. **Inflation of Ballon on MicroCath to drop the arterial stump pressure**
5. **Embolization with doxorubicin loaded particels**
 - Embozene Tandem 40 µm (VARIAN MEDICAL SYSTEMS)
 - Doxorubicin load: 50 mg/ml
6. **Embolization up to complete filling of tumor**
7. **Control angiography with proof of stasis**
8. **Vascular closure**
 - Exoseal 5F (CORDIS)



Case 43 – FRA 03: male, 53 years

Transarterial chemoembolization of hepatic HCC

Operators: N. Nour-Eldin, E. Emará

Clinical data: Male patient with unresectable HCC, no extrahepatic metastases
Bridging therapy before liver transplantation

- Procedural steps:**
1. Revision of MRI and CT images for demonstration of the size and location of hepatic lesions
 2. Puncture of the right femoral artery in Seldinger's Technique followed by application of a 5F sheath
 3. Performance of direct angiography of the coeliac trunc using Sidewinder catheter
 4. Selective catheterisation of the common hepatic artery
 5. Superselective catheterization of the vessels supplying the tumors
 6. Injection of the chemotherapy:
Mitomycin c (10 mg), Cisplatin (50 mg) and Lipoiodol 5-10 ml and Embocept
 7. Demonstration of the hepatic artery post embolization
 8. Removal of the catheters and closure of femoral puncture using angioseal

Case 44 – KGP 04: female, 59 years (P-W)

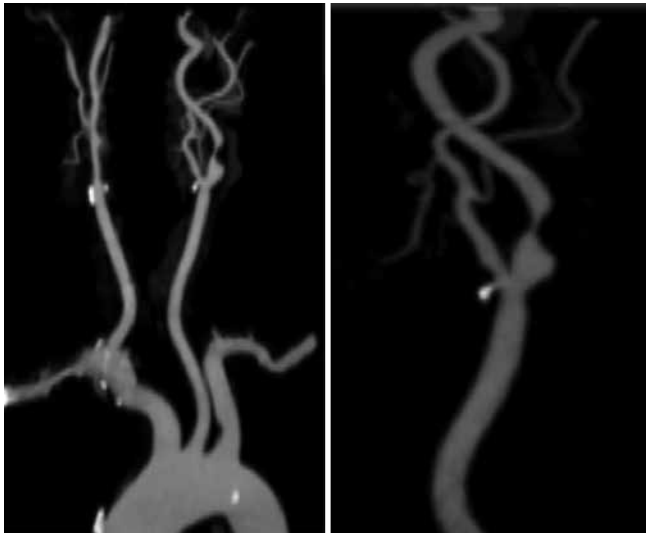
Severe symptomatic LICA CAS case

Operators: D. C. Metzger, M. Aziz

Clinical data: CDU: LICA PSV 358 cm/sec; EDV 131 cm/sec, ICA/CCA 5.9
CTA: 85% LICA stenosis, ~ high lesion

Important items: – severe left hemispheric TIA's with expressive aphasia, right weakness
– severe CAD with angina, 2V CAD
– history of neck XRT for thyroid cancer
– history of cervical disc fusion; limited neck mobility

Risk factors: + tobacco. Htn, + FHx CAD, dyslipidemia



Procedural steps:

1. **Preclose**
 - 6F Perclose; 9F long sheath
2. **Proximal embolic protection**
 - MoMa (MEDTRONIC)
3. **Additional distal embolic protection**
 - NAV6 (ABBOTT)
4. **Predilatation**
 - 4X30 Quantum balloon (BOSTON SCIENTIFIC)
5. **Stenting**
 - XACT 10 X 8 X 40 stent (ABBOTT)
6. **Postdilatation**
 - 5 X 20 NC Emerge balloon (BOSTON SCIENTIFIC)

Case 45 – LEI 15: female, 71 years (G-U)

Subtotal asymptomatic restenosis of the left ICA after CEA

Operators: A. Schmidt, S. Bräunlich

Clinical data: Asymptomatic highgrade stenosis of the internal carotid artery left, dizziness
Mamarian carcinoma 2016 (surgery and radiation)
CEA left 09/18, stroke 2013

Risk factors: Arterial hypertension, hyperlipidemia, renal impairment G3

Duplex: 4.2 m/sec, left distal internal carotid artery

Procedural

steps:

1. Right groin access

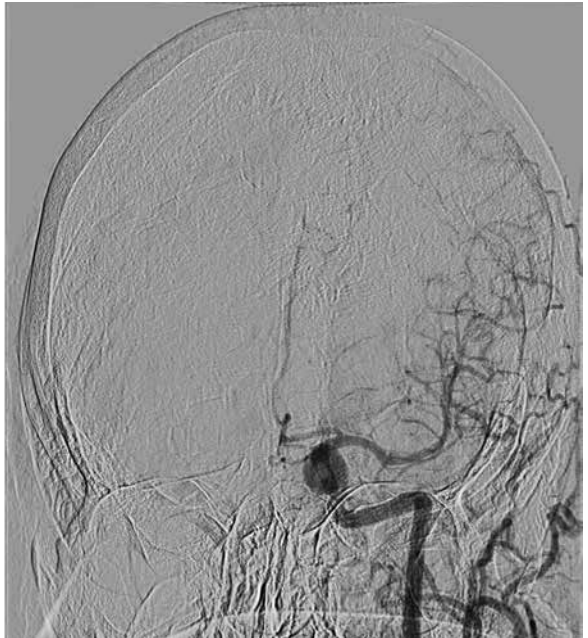
- 5F Judkins Right diagnostic catheter (CORDIS/CARDINAL HEALTH)
- 0.035" SupraCore guidewire (ABBOTT)
- 7F 90 cm Tuohy-Borst sheath (COOK)

2. Cerebral protection

- Filter-wire EZ (BOSTON SCIENTIFIC)

3. Predilatation and stenting

- 3.5/20 mm MiniTrek Monorail balloon (ABBOTT)
- 8/20 mm Roadsaver Carotid stent (TERUMO)



Case 46 – JEN 04: male, 61 years

Prostate artery embolization

Operators: T. Franiel, R. Aschenbach

Clinical data: Lower urinary tract symptoms (LUTS)
IPSS 19, mainly obstructive symptoms (0-30)
QoL 5 (0-6), IIEF-5 25
Prostate volume 75 ml, PSA 2,4 ng/ml
Qmax 8,9ml/s
Residual urinary volume 30ml
Unsuccessful medication therapy for at least 6 mo
Counselling about urol. alternative treatments

Procedural steps:

1. Cone beam CT
2. Identification of prostate arteries and their origin
3. Cannulation of prostate arteries (left side first)
4. Guiding catheter: 4F RIM 65 cm (MERIT MEDICAL)
alternative 4F SIM1 65 cm (MERIT MEDICAL)
5. Microcatheter: Progreat 2.7F 130 cm (TERUMO)
alternative Progreat 2.0F 130 cm (TERUMO)
6. Embolic agent: Embozene 400 µm (BOSTON SCIENFIC)
7. Microcoils for embolization of possible accessory and collateral arteries:
Azur18 helica 2 mm x 2 cm (TERUMO)

Case 47 – FRA 04:

**For case information
please download the LINC 2020 App
or visit the LINC 2020 website.**

Case 48 – JEN 05: female, 53 years (H-U)

DEB-PTA and stentgraft ViabahnX in re-re-stenosis of the superior mesenteric artery

Operators: R. Aschenbach, I. Diamantis

Clinical data: Prior history of abdominal pain and weight loss
 CTA confirmed occluded coeliac trunk and high grade stenosis of SMA
 Primary PTA and stenting with isthmus balloon expandable stent in 3/2019
 Re-stenosis in 8/2019 treated with DEB-PTA
 Re-re-stenosis recently

Procedural steps:

1. **Puncture right groin**
 - 8F sheath (TERUMO)
2. **Cannulation of SMA**
 - Cobra catheter (BOSTON SCIENTIFIC) and angiography
3. **Measurement of transstenotic pressure-gradient**
 - if >10 mmHg treatment is indicated
4. **DEB-PTA**
 - Luminor 7 mm (iVASCULAR)
5. **Implantation of balloon expandable stentgraft**
 - ViabahnX, 7 x 9 mm (GORE)
6. **Control of pressure gradient and angiography**
7. **Vascular closure**
 - Angioseal 8F (TERUMO)



Case 49 – LEI 16: male, 75 years (L-Z)

High-grade stenosis of the superior mesenteric artery

Operators: A. Schmidt, S. Bräunlich

Clinical data: Typical postprandial abdominal pain
CAD, PTCA 2012
PAOD, PTA right SFA 2018
Severe supraaortic disease
Arteriosclerosis of the aortic arch and subclavian artery stenosis left

CT-angiography: Stenosis of the CT, SMA and IMA

Procedural steps:

- 1. Access right femoral artery**

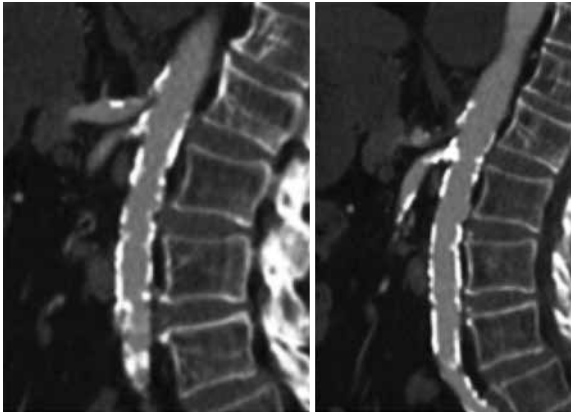
- 8F 25 cm Radiofocus Introducer (TERUMO)
- Oscor Destino Twist Steerable guiding sheath 6.5F (OSCOR)

- 2. Guidewire passage of the stenosis/occlusion of the SMA**

- Command 18 or Connect Flex 18 guidewire (ABBOTT)

- 3. Predilatation and implantation of a covered stent**

- Pacific 5/20 mm balloon (MEDTRONIC)
- BeGraft Peripheral covered stent 7.0/18 mm (BENTLEY)



Celiac-trunk-stenosis

SMA-stenosis

Case 50 – LEI 17: female, 73 years (K-R)

Calcified distal SFA-occlusion right

Operators: S. Bräunlich, A. Fischer

Clinical data: PAOD Rutherford 5, ulceration dig. 1 right, severe claudication right calf, walking capacity 20 m, ABI right 0.45
Amputation Dig. 5 right 2015

Risk factors: Arterial hypertension, hyperlipidemia, diabetes mellitus type 2

Procedural steps:

1. **Left groin and cross-over approach**
 - Judkins Right 5F diagnostic catheter (CORDIS/CARDINAL HEALTH)
 - 0,035" SupraCore guidewire 30 cm (ABBOTT)
 - 6F-40 cm Balkin Up&Over sheath (COOK)
2. **Guidewire passage**
 - 0.035" stiff, angled glidewire, 260 cm (TERUMO)
 - 0.035" Seeker support catheter, 135 cm (BARD/BD)
3. **Angioplasty**
 - UltraScore 5.0/300 mm balloon (BARD/BD)
 - Lutonix GEOALIGN marking system DCB 6.0/120 mm (BARD/BD)
4. **Stenting on indication**
 - LifeStent (BARD/BD)



Case 51 – LEI 18: female, 63 years (P-D)

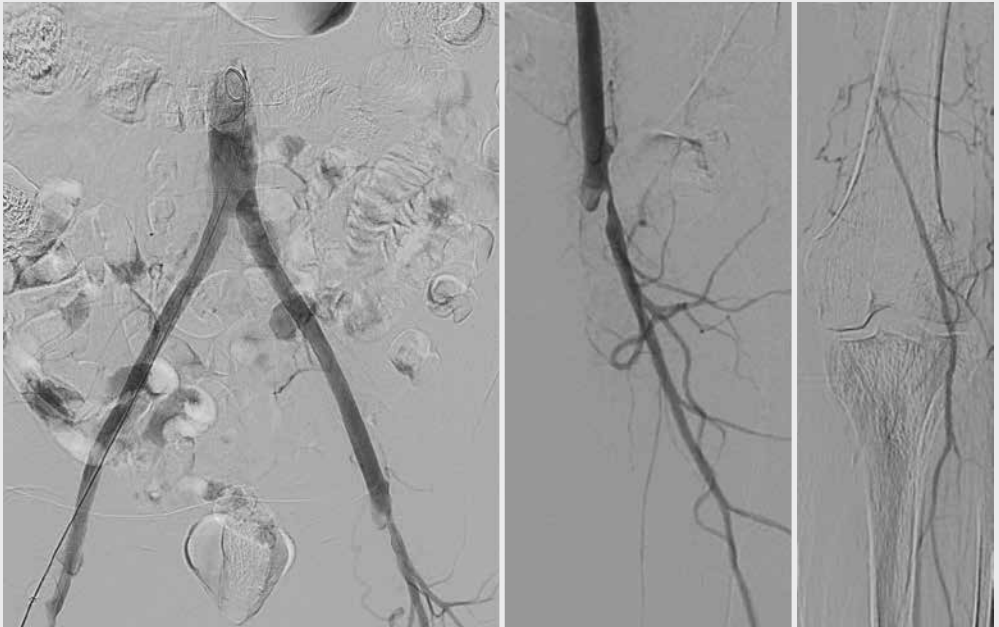
Directional atherectomy of CFA and DFA origin left

Operators: M. Ulrich, S. Bräunlich

Clinical data: PAOD Rutherford 3, severe claudication left > right, walking capacity 20 m, ABI left 0.45, ABI right 0.7
Aorto-bifemoral bypass (on CFA) 2007, failed recanalization attempt left elsewhere

Risk factors: Arterial hypertension, hyperlipidemia, former smoker, diabetes mellitus type 2

Imaging: Angiography 01/20: midgrade infrarenal aortic stenosis, high grade stenosis of distal bypass-anastomosis and DFA left, SFA-occlusions both sides



Procedural steps:

1. **Right groin retrograde and cross-over approach**
 - 0.035" SupraCore guidewire 190 cm (ABBOTT)
 - 7F 40 cm Balkin Up&Over sheath (COOK)
2. **Guidewire passage and placement of an embolic protection**
 - Command 18 guidewire, 300 cm (ABBOTT)
 - Placement of a SpiderFX 6 mm Embolic Protection System (MEDTRONIC)
3. **Atherectomy**
 - Directional atherectomy with HawkOne (MEDTRONIC) of CFA and DFA origin
4. **PTA with DCB**
 - 5 or 6 mm IN.PACT Admiral balloon (MEDTRONIC)
5. **Stenting on indication**
 - Tack Endovascular System (INTACT VASCULAR)

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Thursday,
January 30, 2020

Case 52 – ABT 01: male, 75 years (D-G)

P3 block; BTA Revascularization

Operators: M. Manzi, C. Brigato, E. Gomez Jabalera

Clinical data: Right foot rest pain and Tuc 2C 1° toe lesion; tcpO₂ = 25 mmHg

Risk factors: DM, hypertension

Procedural steps:

- 1. US guided antegrade access**

- 11 cm 6F sheath (TERUMO)
- CO₂ Angio

- 2. Passage of the lesion**

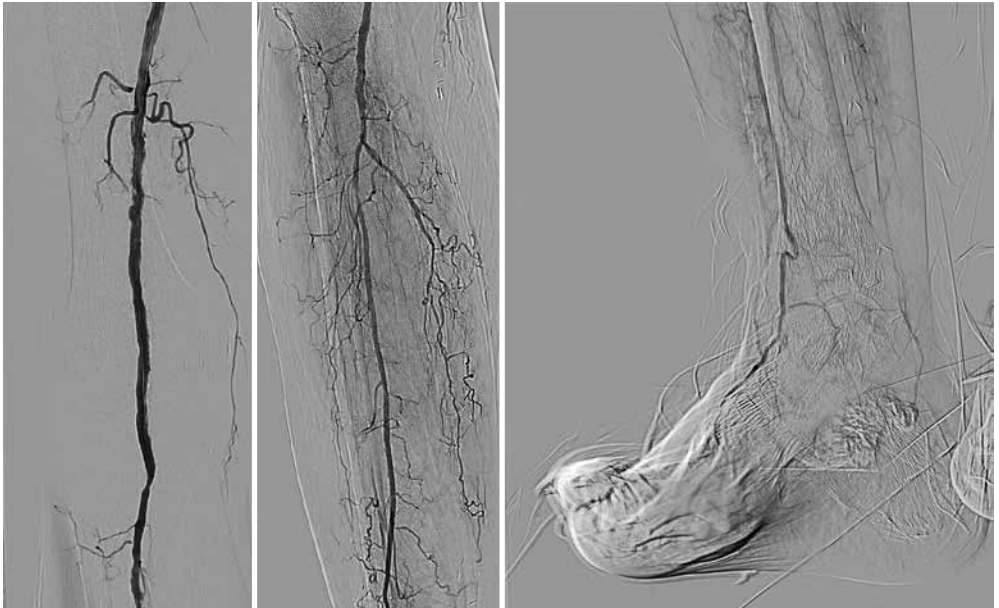
- 4F BER 2 (CORDIS)
- V18CW (BOSTON SCIENTIFIC) for P3 and AT recanalization
- Command ES 0,014 for foot (ABBOTT)

- 3. IVUS evaluation, predilatation and DEB discussion**

- Lutonix (BARD/BD)



Case 53 – LEI 19: male, 76 years (W-M)

CTO of the right anterior tibial artery, CLI-patient**Operators:** A. Schmidt, S. Bräunlich**Clinical data:** Critical limb ischemia, ulceration dig 2 right, restpain and severe claudication right, ABI right 0.2
PTA/stent right popliteal artery 12/19 with no clinical improvement
CAD, AMI 2010, CABG 2010**Risk factors:** Arterial hypertension, diabetes mellitus type 2, hyperlipidemia**Procedural steps:**

1. **Antegrade approach right groin**
 - 6F 55 cm sheath (COOK)
2. **Guidewire passage antegrade into anterior tibial artery**
 - 0.014" Command (ABBOTT)
 - 0.014" PT2 guidewire 300 cm (BOSTON SCIENTIFIC)

In case of failure: retrograde approach
3. **PTA**
 - Vessel preparation – scoring balloon (VascuTrak, BARD/BD)
 - Lutonix BTK DCB (BARD/BD)
4. **Stenting on indication**
 - Tack Endovascular System (INTACT VASCULAR)

Case 54 – LEI 20: male, 70 years (P-H)

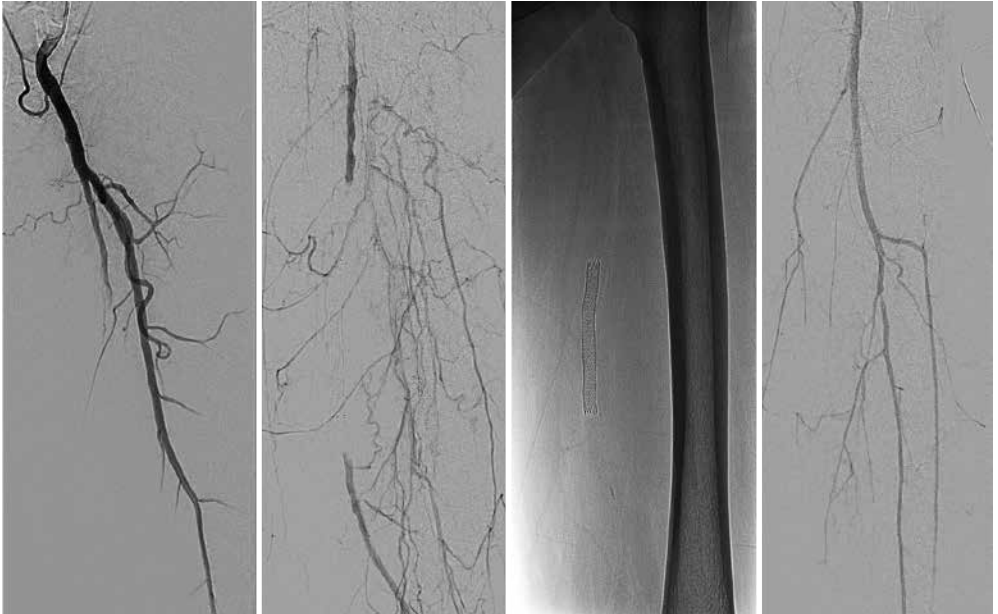
Chronic in-stent reocclusion left SFA

Operators: S. Bräunlich, J. Schuster

Clinical data: Severe claudication left, ABI 0.65; walking capacity 100 meters
Rutherford class 3
PTA/stenting left CIA and left SFA 07/19
Stroke 1997

Risk factors: Heavy smoker (50PY), arterial hypertension, hyperlipidemia

- Procedural steps:**
- 1. Right groin retrograde and cross-over approach**
 - 8F Balkin Up&Over sheath (COOK)
 - 2. Guidewire passage**
 - 0.018" Command 18 guidewire, 300 cm (ABBOTT)
 - 0.018" Quick-Cross support catheter, 135 cm (PHILIPS)
 - 3. Thrombectomy**
 - Rotarex 8F (STRAUB MEDICAL)
 - 4. PTA with DCBs**
 - Ranger DCB 5 mm (BOSTON SCIENTIFIC)



Case 55 – LEI 21: male, 70 years (S-A)

Reocclusion of a femoro-popliteal bypass left, CLI

Operators: S. Bräunlich, M. Ulrich

Clinical data: PAOD Rutherford 5, walking capacity 50 m, ulcerations dig. 1-3, ABI left 0.3, multiple interventions both sides: PTA both SFA, TEA both groins, iliaco-femoral bypass right 2013, femoro-popliteal bypass left 2015, PTA of the bypass left 05/18
CAD, CABG 2007

Risk factors: Arterial hypertension, hyperlipidemia, nicotine abuse (50PY)



Procedural steps:

1. **Right groin retrograde and cross-over approach**
 - 8F Balkin Up&Over sheath (COOK)
2. **Guidewire passage**
 - 0.018" Command 18, 300 cm (ABBOTT)
 - 0.018" Quick-Cross support catheter, 135 cm (PHILIPS)
3. **Thrombectomy**
 - Rotarex 8F (STRAUB MEDICAL)
4. **PTA with DCBs, rtPA-thrombolysis on indication**
 - 5 mm and 6 mm IN.PACT Pacific balloon for potential anastomosis-stenosis (MEDTRONIC)

Case 56 – LEI 22: male, 77 years (L-G)

Recanalization of an extremely calcified SFA-occlusion right using the PQ-Bypass-DETOUR system

Operators: A. Schmidt, D. Branzan

Clinical data: PAOD Rutherford 5, forefoot ulcerations, walking capacity 50 m, ABI right 0.37
PTA left SFA 05/19, CAD, aortic valve replacement 08/2001

Risk factors: Arterial hypertension, diabetes mellitus type 2, hyperlipidemia, renal impairment G3



Procedural steps:

1. **Left femoral cross-over access**
 - 8F 40 cm Balkin Up&Over sheath (COOK)
 - 0.035" SupraCore guidewire 300 cm (ABBOTT)
2. **Retrograde posterior tibial venous access**
 - 5F 10 cm Radiofocus Introducer (TERUMO)
3. **Isolating vascular targets and creating proximal anastomosis**
 - intravenous: PQ-Snare at the level of proximal SFA-occlusion
 - intraarterial: Extending the needle of PQ-Crossing-Device into the vein
 - Snaring 0.014 PT2, 300 cm guidewire (BOSTON SCIENTIFIC)
 - PTA with 4/20 mm Amphirion Deep (MEDTRONIC)
4. **Create distal anastomosis**
 - intravenous: PQ-Snare at the level distally of the occlusion
 - Placement of crossing device from arterial site into the vein proximal to the PQ-Snare and expand needle into the artery and GW-passage into the popliteal artery
 - PTA with 4/20 mm Amphirion Deep (MEDTRONIC)
5. **TORUS stentgraft system implantation (PQ BYPASS)**



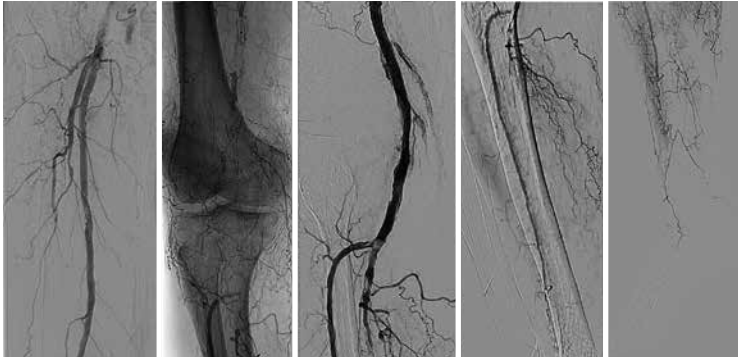
Case 57 – LEI 23: male, 76 years (E-K)

CLI, deep vein arterialization of a "desert foot" right

Operators: D. Branzan, A. Schmidt

Clinical data: PAOD Rutherford 5, non-healing forefoot ulcerations, mediasclerosis, ABI > 1.4
PTA right popliteal artery 12/19 and proximal ATA
Cholangiocarcinoma with metastasis 02/18

Risk factors: Arterial hypertension, hyperlipidemia, diabetes mellitus type 2



Procedural steps:

1. **Right groin antegrade access**
 - 7F 55 cm Flexor Check-Flo sheath, Raabe Modification (COOK)
2. **Right distal venous tibial retrograde access**
 - 5F sheath Introducer 2° (TERUMO)
3. **Arteriography and phlebography to define the optimal level for arterio-venous crossing**
4. **Crossing from artery to vein**
 - LimFlow Arterial Catheter 7F (LIMFLOW)
 - LimFlow Venous Catheter 5F (LIMFLOW)
 - LimFlow Ultrasound System (LIMFLOW)
 - PT2 0.014" guidewire to pass from artery into vein (BOSTON SCIENTIFIC)
 - Predilatation with MiniTrek 3,5/20 mm OTW coronary balloon (ABBOTT)
5. **Guidewire passage through vein and vein preparation**
 - PT2 0.014" guidewire (BOSTON SCIENTIFIC) or
 - Command 18 guidewire (ABBOTT)
 - Push Valvulotome 4F (LIMFLOW)
 - 4.0/120 mm Pacific balloon (MEDTRONIC)
6. **Implantation of covered stentgrafts**
 - LimFlow Extension stentgrafts 7F 5,5 mm x 150 mm (LIMFLOW) for vein coverage
 - LimFlow Crossing stentgraft 7F 3,5 x 60 mm (LIMFLOW) for connection artery to vein



Case 58 – LEI 24: male, 59 years (H-D)

Femoro-popliteal occlusion left, treatment according to BEST-SFA study randomization

Operators: A. Schmidt, J. Schuster

Clinical data: PAOD Rutherford 3, claudication left calf, walking capacity 100 m, ABI left 0.6
CAD, AMI 2009, PTCA 2009, COPD

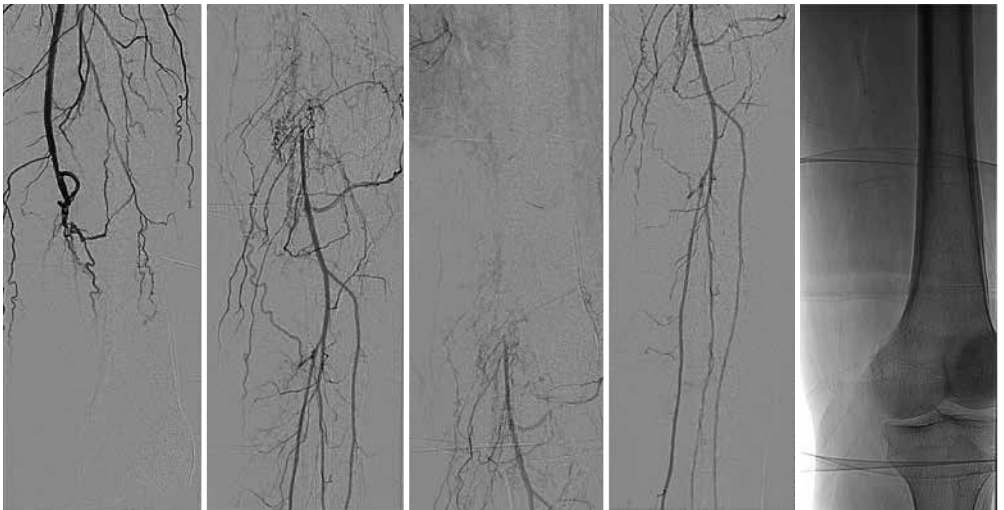
Risk factors: Arterial hypertension, hyperlipidemia, former smoker (45PY), renal impairment G3

Procedural steps:

- 1. Right retrograde and cross-over approach**
 - 7F 40 cm Up&Over sheath (COOK)
- 2. Guidewire passage from antegrade**
 - 0.018" Command 18 guidewire, 300 cm (ABBOTT)
 - GoBack crossing catheter (UPSTREAM PERIPHERAL) in case of failure to pass with a GW or retrograde approach
- 3. After guidewire passage**

Randomization to either

 - 'best' stenting strategy Eluvia DES (BOSTON SCIENTIFIC) and/or
 - Supera (ABBOTT) or
 - 'best' DCB treatment Inpact (MEDTRONIC) potentially including HawkOne atherectomy (MEDTRONIC)



Case 59 – MUN 04: male, 52 years (W-K)

OCT-guided atherectomy of popliteal stent ISR followed by DCB

Operators: A. Schwindt, A. Argyriou, A. Sohr

Clinical data: 1990 Luxation trauma of right knee with emergency distal origin saphenous vein bypass, knee TEP Oct/2018, Sept 2019 Rutherford IV right leg, advanced ante- & retrograde recanalization of chronic occluded popliteal bypass and stent PTA with three 5,5 mm Supera stents

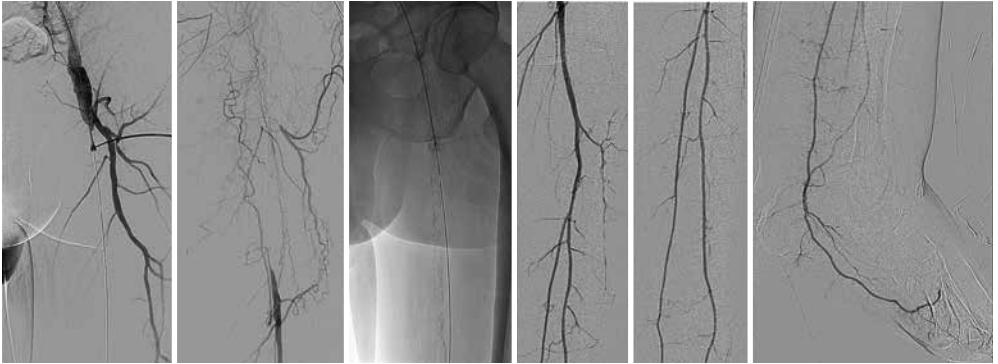
Present state: After symptom free interval recurrent claudication and restpain right leg, CCDuplex shows TOSAKA II ISR of the popliteal vein graft with v_{max} of 350 cm/sec, drop of ABI from >1 in September to 0.4 right leg January 2020



Procedural steps:

1. Duplex guided antegrade puncture of right CFA, insertion of 5F 10 cm sheath (TERUMO) angiogram of right leg
2. Change to 7F 40 cm sheath (Destination, TERUMO), placement of 4 mm filter in TP trunc (Spider, MEDTRONIC)
3. OCT-guided directional atherectomy of ISR with 7F Pantheris (AVINGER)
4. Antirestenotic therapy with Passeo Lux DCB (BIOTRONIK)
5. Filter recovery and closure of access site with Angioseal VCD (TERUMO)

Case 60 – LEI 25: male, 62 years (R-A)

Calcified occlusion of the left SFA**Operators:** A. Schmidt, J. Schuster**Clinical data:** PAOD Rutherford 3 left, walking capacity 100 m, claudication left calf, ABI left 0.57
PTA of a 8 cm long profunda femoris occlusion right 10/2019 and right SFA 12/19
CAD, ICM (EF 35%), CABG and aortic valve replacement 09/19,
atrial fibrillation, pacemaker 09/19**Risk factors:** Arterial hypertension, hyperlipidemia, current smoker (40PY)**Procedural steps:**

- 1. Right groin and cross-over approach**
 - Judkins Right 5F diagnostic catheter (CORDIS/CARDINAL HEALTH)
 - 0.035" SupraCore guidewire 30 cm (ABBOTT)
 - 7F-40 cm Balkin Up&Over sheath (COOK)
- 2. Antegrade guidewire passage**
 - 0.035" stiff angled glidewire, 260 cm (TERUMO)
 - CXC 0.035" support catheter, 135 cm (COOK)
- 3. Retrograde guidewire passage access via occluded SFA**
 - 7 cm 18 Gauge needle (COOK)
 - 0.018" V-18 Control guidewire, 300 cm (BOSTON SCIENTIFIC)
 - 4F-10 cm Radiofocus Introducer (TERUMO)
 - GoBack crossing catheter (UPSTREAM PERIPHERAL)
- 4. PTA with normal and high pressure balloons**
 - 6.0/20 mm Admiral Xtreme balloon (MEDTRONIC)
 - 7.0/20 mm Conquest non-compliant high pressure balloon (BARD/BD)
- 5. Stenting**
 - In case of inability to open the balloons fully implantation of a Viabahn 7.0/100 mm (GORE)
 - Relining with Supera Interwoven Nitinol stent (ABBOTT)
 - Eluvia drug-eluting stent for proximal SFA (BOSTON SCIENTIFIC)

Case 61 – ABT 02: female, 69 years (F-F)

ISR in popliteal supra (2016)

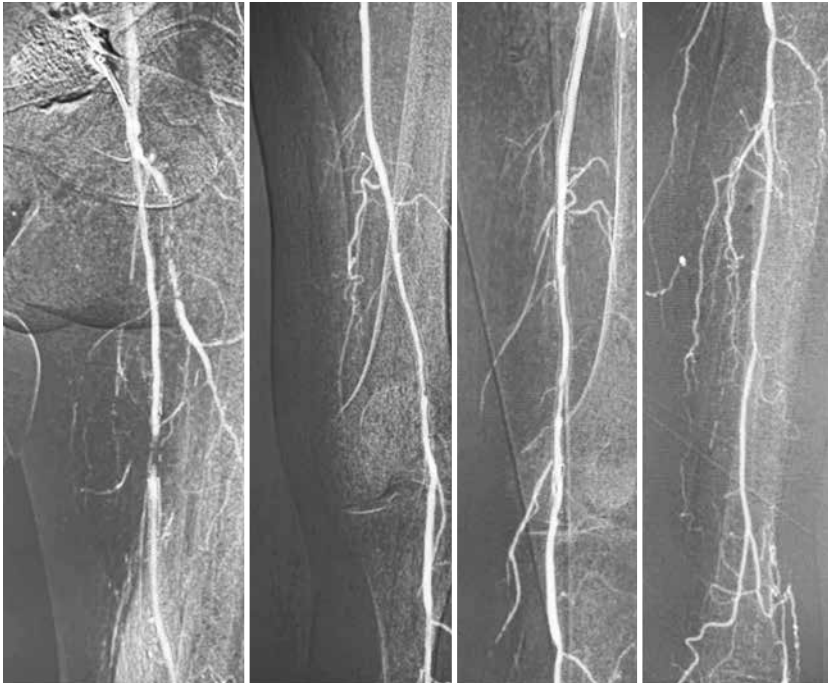
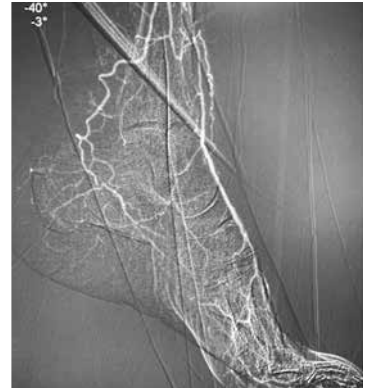
Operators: M. Manzi, C. Brigato, E. Gomez Jabalera

Clinical data: Left pretibial TUC 3C lesion
7/2016 popliteal supra implantation
TcPO₂= 30 mmHG

Risk factors: DM, dyslipidemia, hypertension

Procedural steps:

1. **Vessel access**
 - Us guided 6F 11 cm sheath (TERUMO)
 - CO₂ Angio
2. **Passage of the lesion**
 - 4F BER 2 (CORDIS)
 - 0,014 Command ES (ABBOTT)
 - IVUS
3. **Debulking discussion and DEB PTA**
4. **Closure of access site**
 - Us guided Angio-Seal closure device (TERUMO)



Case 62 – MUN 05: female, 76 years (L-U)

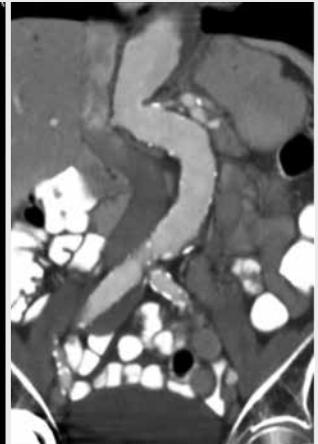
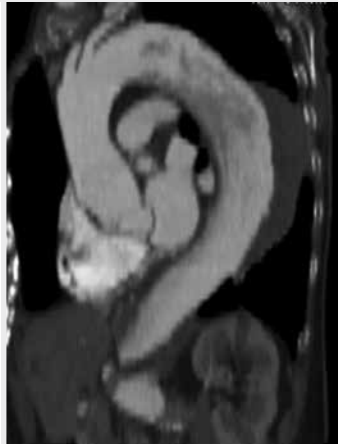
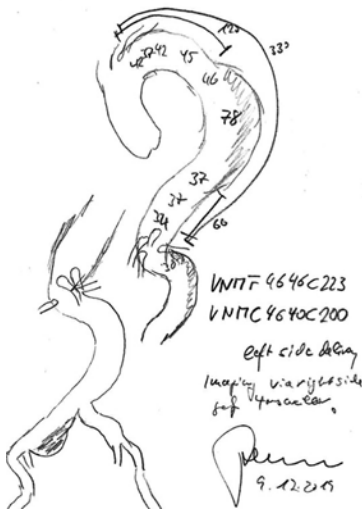
TEVAR with Valiant Navion for a TAA 76 mm max

Operators: M. Austermann, S. Mühlenhöver, Y. Khatadba

Clinical data: Arterial hypertension, CAD

Present state: Growing thoracic aneurysm

- Procedural steps:**
1. Percutaneous approach both groins, 5F sheath left groin, Prostar XL (ABBOTT) right groin, placement of 14F
 2. Change for a Lunderquist wire through the right side
 3. Implantation of two Valiant Navion endografts (MEDTRONIC)
 4. Final angiography, if needed postdilatation
 5. Closure of the right groin using Prostar XL (ABBOTT), Angioseal (ST. JUDE) left groin



Case 63 – PAR 03

For case information
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Case 64 – MUN 06: male, 74 years (E-A)

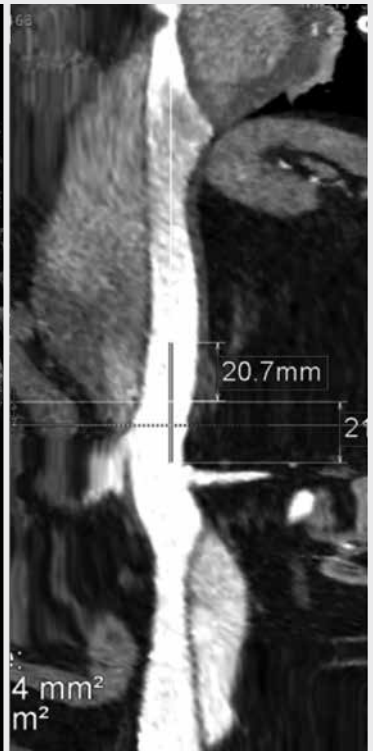
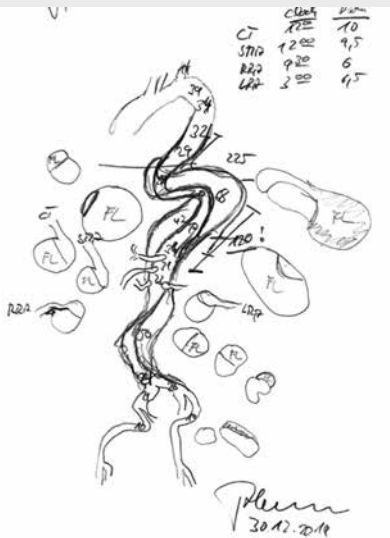
Thoracic true lumen stentgrafting for a post-dissection aneurysm

Operators: M. Austermann, S. Mühlhoyer, Y. Khatadba

Clinical data: Arterial hypertension, hypertensive heart disease, claudication/PAD

Present state: Severely kinked dissected thoracoabdominal aneurysm 68 mm max
True lumen collaps

- Procedural steps:**
1. Percutaneous approach both groins, 5 F sheath left groin, Prostar XL (ABBOTT) right groin, placement of 14F
 2. Cannulation of the true lumen from above and pull-through wire between the left arm and the right groin (4 m soft TERUMO wire) Pigtail catheter through the left groin for imaging
 3. Placement of the thoracic endograft Zenith TX2 (COOK) as a first session in order to exclude the false lumen
 4. Final angiography, if needed postdilatation
 5. Closure of the right groin using Prostar XL (ABBOTT), Angioseal (ST. JUDE) left groin

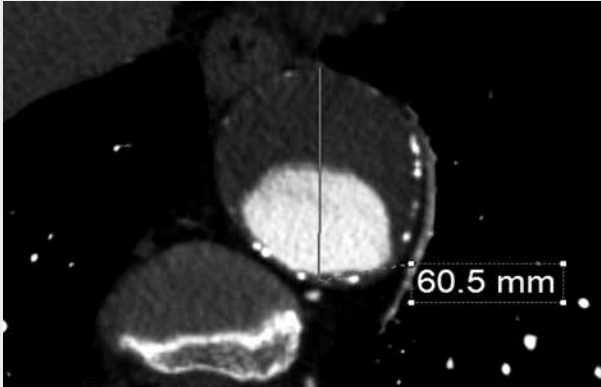


*Case 65 – PAR 04: male, 85 years***FEVAR for type 5 thoraco abdominal aortic aneurysm****Operators:** S. Haulon, D. Fabre, P. Charbonneau, A. Girault**Clinical data:** Lumbar spine surgery for herniated disc (1993)
Aorto bi-femoral bypass for an infrarenal AAA (1998)
Bilateral femoral arteries angioplasty and stenting, L CFA endarterectomy (2012)
Urothelial cancer resected in 2011, colon polypectomy in 2003
Chronic kidney disease (GFR 48 ml/min), hypertension, dyslipidemia**Present state:** ASA 3, ECG: sinus, TTE: LVEF: 65%, normal

- Procedural steps:**
1. L: Advance 16F 30 cm GORE Dryseal sheath in the LCFA over Lunderquist –
2x 6F-55 cm COOK Ansel sheaths
100 U/kg Heparin (Target ACTffl250)
L (through one of the 6F): advance long pigtail catheter
R: 10F sheath/Lunderquist/ dilators up to 20
 2. R: Deployment of proximal TEVAR, just above the celiac trunk
 3. Fluoroscopy to locate fenestrations gold markers
R: Advanced fenestrated endograft – Aortic angiogram –
fenestrated endograft deployment
 4. R: Rosen wire advanced through preloaded catheter – Exchange preloaded catheter
for a 6F-90 cm COOK Ansel Shuttle sheath – Exchange Rosen for a Stealcore
0.018- 300 cm wire – Retrieve 6F to the level of the fenestration – Retrieve the 6F dilator –
Puncture valve – DAV + Terumo/Roadrunner through 6F for renal artery catheterisation
– Renal angiogram – Exchange Terumo for Rosen – Retrieve Stealcore wire – Advance 6F
into the renal artery – Advance BENTLEY Begraft bridging stent to parking position
 5. Same for controlateral renal artery
 6. L: Through 6F sheath advance BER + Terumo to catheterize fenestrated endograft
lumen – Advance 6F below the fenestration (SMA/CT) – USL + Terumo/ Roadrunner
through 6F sheath to catheterise target vessel (SMA/CT) – Vessel angiogram –
Exchange Terumo for Rosen wire – Advance 6F into target vessel – Advance
BENTLEY Begraft bridging stent to parking position
 7. R: Release diameter-reducing ties – proximal and distal attachments – Nose retrieval
under fluoroscopy

continued on page 72

Case 65 – PAR 04 (cont.)



Procedural steps (cont.):

8. L: SMA/CT stent deployment (3-4 mm protruding in the aortic lumen) after 6F retrieval – Flare the aortic portion of stent with 10-20 mm balloon – Advance 6F in the SMA/CT stent/angiogram (SMA: exchange Rosen for terumo wire)
9. R: Renal artery stent deployment (3-4 mm protruding in aortic lumen) after 6F retrieval – Flare the aortic portion of stent with 9-20 mm balloon – Advance 6F back into the renal stent – angiogram
10. R: Remove nose under fluoroscopy / Remove fenestrated device delivery system
L: Withdraw 6F sheath in 16F – Insert and deploy bifurcated device and iliac limbs
11. CODA balloon to mold overlaps and distal sealing zones
Pigtail catheter – Angiogram + non-contrast CBCT

4-inner branch-EVAR and IBD on the right side for a post-dissection thoracoabdominal aneurysm 70 mm max

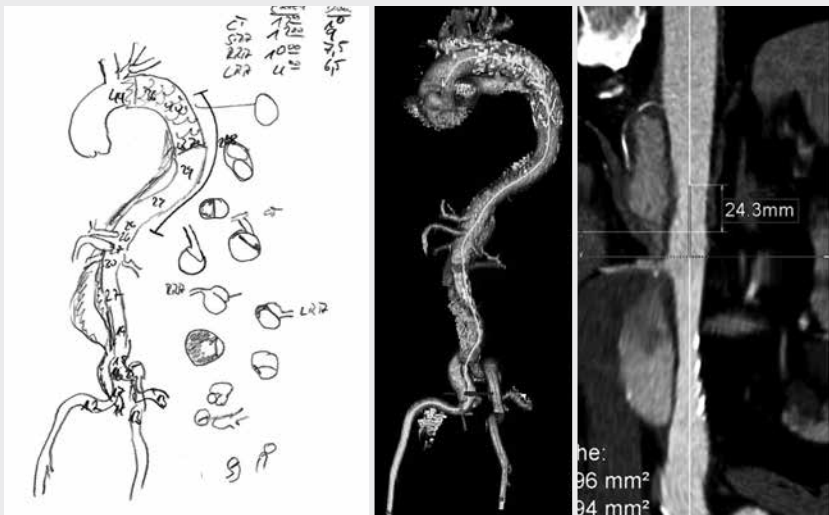
Operators: M. Austermann, E. Beropoulos, Y. Shehada

Clinical data: 7 cm thoracoabdominal post-dissection aneurysm after type B dissection 2009, thoracic true lumen stentgrafting 2009 with left subclavian transposition on the left CCA

Risk factors: Arterial hypertension, hypertensive heart disease, atrial fibrillation, deep vein thrombosis 12/2019 left groin

Procedural steps:

1. Right axillary access 5F sheath via cut down
2. Percutaneous approach both groins (Prostar XL, ABBOTT), 14 F (COOK) both groins
3. Pull-through wire between left femoral and axillary access
Pig tail catheter through the right groin for imaging
Registration of the Fusion technology
4. Placement of the CMD-inner-branch-endograft (COOK) with 4 branches with help of the Fusion system
5. Placement of the bifurcated device through the left groin and the IBD device through the right groin and the iliac extensions
6. Placement of the 12F Flexor sheath from above over the pull-through wire
7. Closure of the groins in order to avoid SCI
8. Bridging of all the branches from the axillary access (Advanta GETINGE, VBX or Viabahn GORE)
9. Closure of the axillary access



Case 67 – LEI 26: male, 61 years, (K-W)

Long, moderately calcified SFA-occlusion left

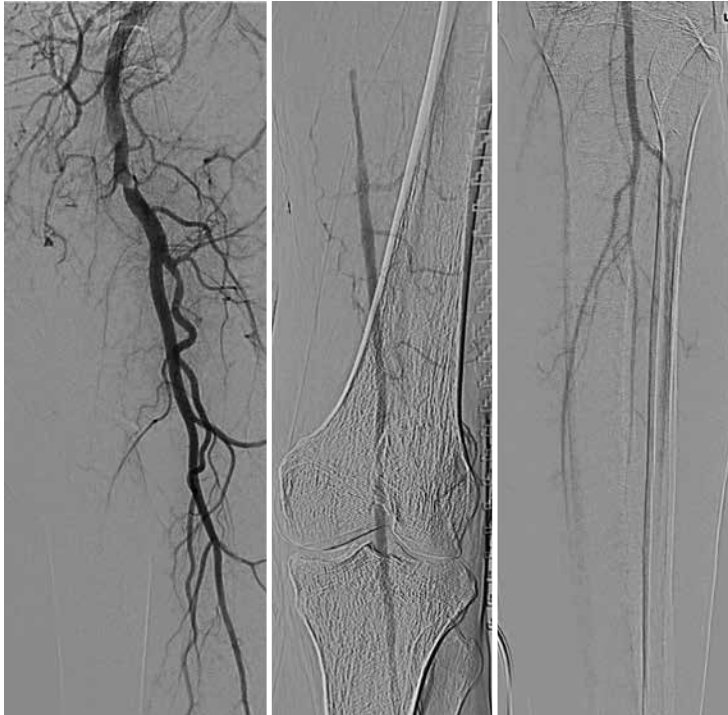
Operators: S. Bräunlich, M. Ulrich

Clinical data: PAOD Rutherford 3, claudication left calf, walking capacity 150m, ABI left 0.63

Risk factors: Hyperlipidemia, current smoker

Procedural steps:

- 1. Right groin and cross-over access**
 - IMA-diagnostic 5F catheter (CORDIS/CARDINAL HEALTH)
 - 0.035" angled soft Radiofocus guidewire, 190 cm (TERUMO)
 - 0.035" SupraCore guidewire, 190 cm (ABBOOTT)
 - 6F Balkin Up&Over sheath, 40 cm (COOK)
- 2. Passage of the occlusion left SFA**
 - 0.018" Advantage guidewire (TERUMO)
 - 0.018" CXI support catheter (COOK)in case of failure:
 - GoBack crossing catheter (UPSTREAM PERIPHERAL)
- 3. Vessel preparation left SFA with scoring balloon**
 - UltraScore 5.0/300 mm balloon (BARD/BD)
- 4. Primary stenting**
 - 6 mm Eluvia DES (BOSTON SCIENTIFIC)



Case 68 – ABT 03: male, 81 years (A-V)

BTK and BTA

Operators: M. Manzi, C. Brigato, E. Gomez Jabalera

Clinical data: Left foot and TUC 3c 1°-2° toes
 TcPO₂ = 14 mmHG
 AT and PT long occlusion
 Plantar arteries and arch occlusion

Risk factors: DM, ischemic heart disease

- Procedural steps:**
1. **Vessel access**
 - US guided 6F 11 cm sheath (TERUMO)
 - CO₂ angio
 2. **Passage of the lesion**
 - 4F CORDIS Ber 2 and V18 CW
 - 0,014 Command Es
 - Asahi intraluminal
 - Subintimal AT and PT recanalization attempts and plantar arch reconstruction
 3. **IVUS evaluation**
 4. **POBA PTA/DEB PTA**
 - Lutonix (BARD/BD)
 5. **Closure of access site**
 - US guided Angio-Seal closure device (TERUMO)



Case 69 – ABT 04: male, 71 years (M-A)

BTK and BTA

Operators: M. Manzi, C. Brigato, E. Gomez Jabalera

Clinical data: Right foot TUC 3c 4°-5° toes
TcPO₂ = 25 mmHG

Risk factors: DM, dyslipidemia

Procedural

1. Vessel access

- steps:**
- US guided 6F 11 cm sheath (TERUMO)
 - CO₂ angio

2. Passage of the lesion

- 4F CORDIS Ber 2 and V18 CW
- 0,014 Command Es
- Asahi intraluminal
- Subintimal AT and PT recanalization attempts and plantar arch reconstruction

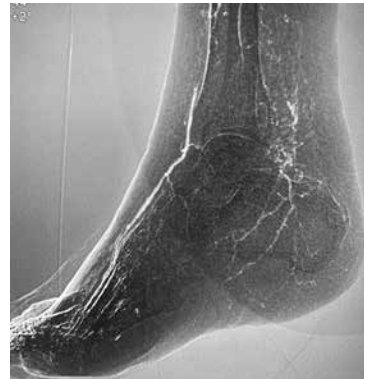
3. IVUS evaluation

4. POBA PTA/DEB PTA

- Lutonix (BARD/BD)

5. Closure of access site

- US guided Angio-Seal closure device (TERUMO)



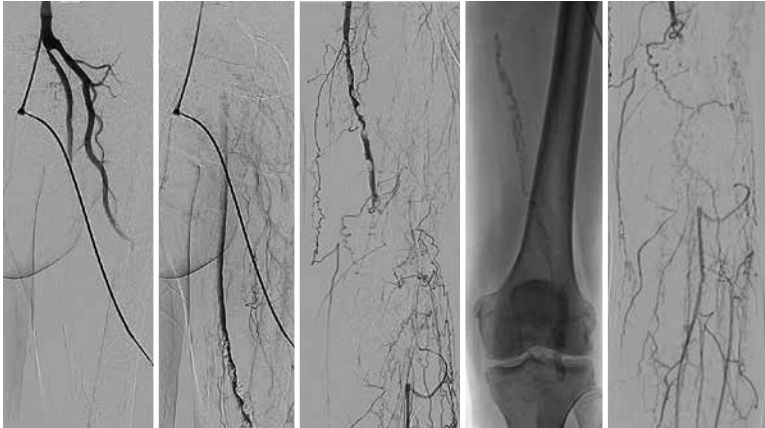
Case 70 – LEI 27: male, 73 years (K-W)

Severely calcified CTO of the left distal SFA and left popliteal artery, "pave and crack"-technique

Operators: A. Schmidt, M. Ulrich

Clinical data: PAOD Rutherford III left, painfree walking distance 100 m, ABI left: 0.45
Multiple interventions right SFA and popliteal artery, D1-amputation right 10/19
CAD, ICM (EF 20%), AMI 2001, CABG 2001, ICA-occlusion left

Risk factors: Arterial hypertension, current smoker, diabetes mellitus type 2, hyperlipidemia



Procedural steps:

1. **Right groin retrograde and cross-over approach**
 - IMA 5F diagnostic catheter (CORDIS/CARDINAL HEALTH)
 - 0.035" soft angled Radiofocus guidewire, 190 cm (TERUMO)
 - 0.035" SupraCore guidewire 190 cm (ABBOTT)
 - 7F 55 Check-Flo Performer sheath, Raabe Modification (COOK)
2. **Antegrade guidewire passage**
 - 0.035" stiff angled glidewire, 260 cm (TERUMO)
 - CXC 0.035" support catheter, 135 cm (COOK)
3. **Retrograde guidewire passage**

Access via the proximal anterior tibial artery:

 - 9 cm 20 Gauge Spinal Needle (BD)
 - 0.018" V-18 Control guidewire, 300 cm (BOSTON SCIENTIFIC)
 - 4F 10 cm Radiofocus Introducer (TERUMO)
 - GoBack crossing catheter (UPSTREAM PERIPHERAL)
4. **PTA and Stenting**
 - 5.0/20 mm and 6.0/20 mm Admiral Xtreme balloon (MEDTRONIC)
 - 6.0/20 Conquest non-compliant high pressure balloon (BARD/BD)

In case of inability to open the balloons fully:

 - Implantation of a Viabahn 6.0/150 mm (GORE)
 - Relining with Supera Interwoven Nitinol stent (ABBOTT)

LEIPZIG
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COURSE
2020

L I N C

Friday,
January 31, 2020

Case 71 – MUN 08: male, 66 years, (V-W)

Proximal and distal extension of a 4-branched thoracoabdominal endograft by TEVAR and IBD on the right side

Operators: M. Austermann, E. Beropoulos, Y. Khatadba

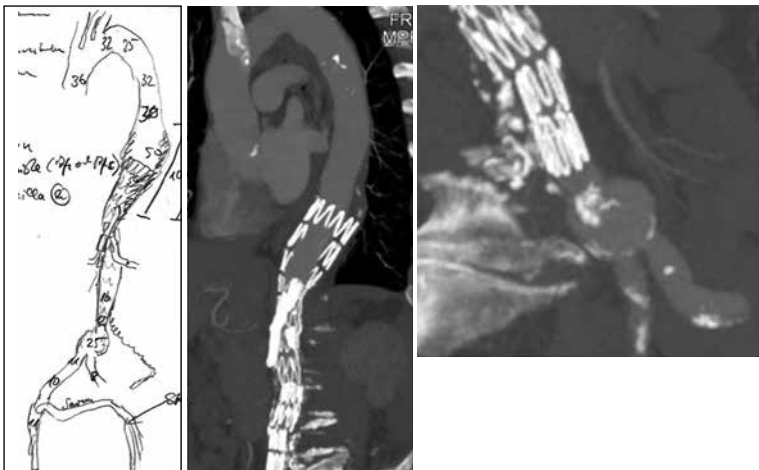
Clinical data: CAD-stent-PTCA 1/12, arterial hypertension

Clinical history: 2003: Open repair of a AAA by replacement with a monoiliac graft
Preexisting occlusion of the left iliac artery
2014: BEVAR for a proximal anastomotic aneurysm and a TAAA type 4 in combination with a cross-over bypass

Present state: New aneurysm of the thoracic aorta above the graft
and growing iliac aneurysm below the graft
Stenosis of the proximal SFA

Procedural steps:

1. Left axillary access 5 F sheath via cut down
2. Cut down right groin below the cross over bypass
Placement of a 14F sheath (COOK)
Cannulation of the aorta up to the aortic valve and change for a Lunderquist wire (COOK)
3. Implantation of the thoracic endograft TGM 37 37 15 E (GORE)
4. Implantation of the IBD ZBIS 12 62 41 (COOK)
5. Closure of the groins in order to avoid SCI
6. Placement of the the 12F Flexor sheath from above
7. Bridging of the hypogastric branch (Advanta GETINGE, VBX or Viabahn GORE)
8. Endovascular treatment of the SFA stenosis through the bypass
9. Closure of the axillary access



Case 72 – LEI 28: male, 57 years (A-G)

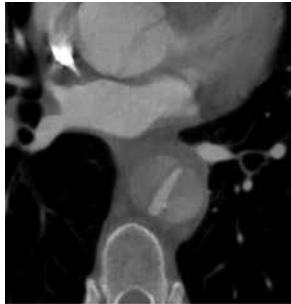
Subacute type-B-dissection, STABILISE-therapy

Operators: A. Schmidt, D. Branzan

Clinical data: Subacute type-B-dissection, progressive dilatation of the descending thoracic aorta
EVAR 2019 elsewhere
Coilembolisation of segmental arteries to reduce the risk of spinal ischemia during Stabilise therapy
Implantation of a thoracic dissection stentgraft 1/2020

Procedural steps:

- 1. Access right groin**
 - 16F sheath (COOK) right groin after preloading of Proglide systems (ABBOTT)
- 2. Confirmation of guidewire position in the true lumen by IVUS**
 - Visions PV 0.035" Digital IVUS catheter (VOLCANO-PHILIPS)
- 3. Stent implantation**
 - Dissection Endovascular stent (COOK)
- 4. Postdilatation of the dissection stent**
 - Reliant balloon (MEDTRONIC)



Case 73 – LEI 29: female, 74 years (K-H)

Severely calcified femoro-popliteal occlusion left

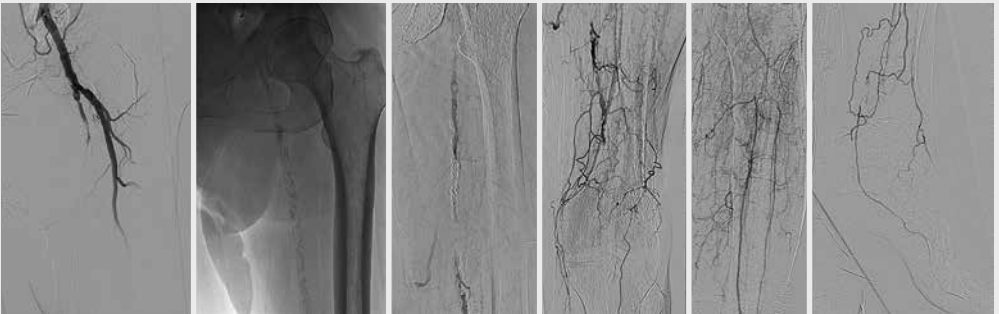
Operators: S. Bräunlich, M. Ulrich

Clinical data: PAOD Rutherford 5, ulcerations dig. 1-3, claudication left calf, walking capacity 50m, ABI left 0.3, failed recanalization attempt elsewhere
PTA right SFA 01/20, amputation Dig 1. right
CAD, PTCA 05/19, CABG 2007

Risk factors: Arterial hypertension, diabetes type 2 with multiple complications, hyperlipidemia, renal impairment G3

Procedural steps:

- 1. Right retrograde and cross-over approach**
 - 7F 40 cm Up&Over sheath (COOK)
- 2. Guidewire passage from antegrade**
 - 0.018" Command 18 guidewire, 300 cm (ABBOTT)
 - GoBack Crossing-Catheter (UPSTREAM PERIPHERAL)
in case of failure to pass with a GW or retrograde approach
- 3. Vessel preparation and PTA**
 - 4.0 – 6.0 mm Armada 35 balloon (ABBOTT)
 - Conquest high pressure balloon on indication (BARD/BD)
 - PTA of the TPT and distal popliteal artery with DCBs:
Ranger (BOSTON SCIENTIFIC)
- 4. Stenting of the SFA and proximal popliteal artery**
 - 5.0 or 6.0/150 mm Supera Interwoven Selfexpanding Nitinol stent (ABBOTT)



Case 74 – LEI 30: female, 72 years (D-M)

Calcified occlusion of the right distal SFA and right popliteal artery

Operators: M. Ulrich, S. Bräunlich

Clinical data: PAOD Rutherford 4, restpain and severe claudication right calf, walking capacity 10 m, ABI right 0.2, failed recanalization attempt 09/19 elsewhere

Risk factors: Arterial hypertension, hyperlipidemia, diabetes mellitus type 2

Procedural steps:

1. Left groin and cross-over approach

- Judkins Right 5F diagnostic catheter (CORDIS/CARDINAL HEALTH)
- 0.035" SupraCore guidewire 30 cm (ABBOTT)
- 7F-40 cm Balkin Up&Over sheath (COOK)

2. Second attempt of guidewire passage from antegrade

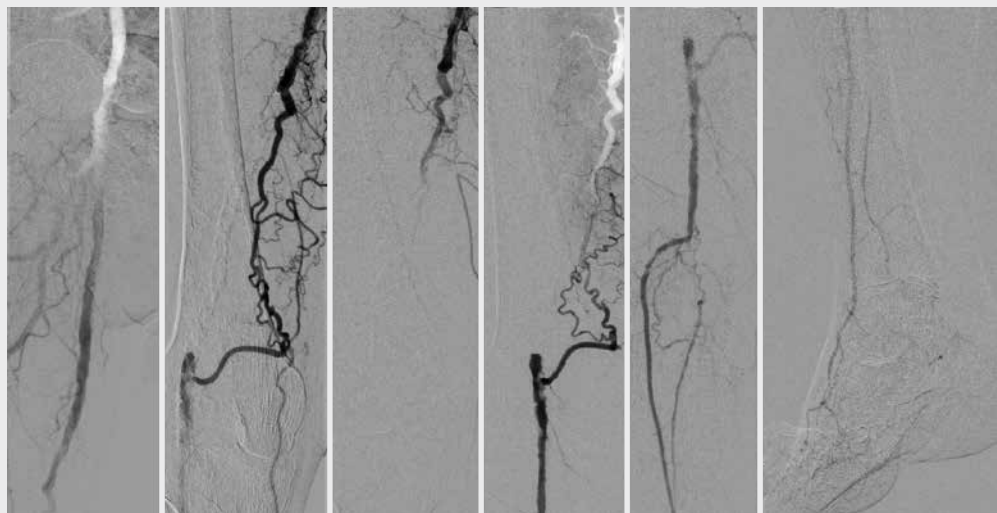
- 0.018" Command 18 guidewire, 300 cm (ABBOTT)
- GoBack crossing catheter (UPSTREAM PERIPHERAL)
or retrograde approach via anterior tibial artery in case of failure to pass

3. Vessel preparation

- UltraScore 5.0/300 mm scoring balloon (BARD/BD)
- 4.0 – 6.0 mm Armada 35 balloon (ABBOTT)
- Conquest high pressure balloon on indication (BARD/BD)

4. Stenting

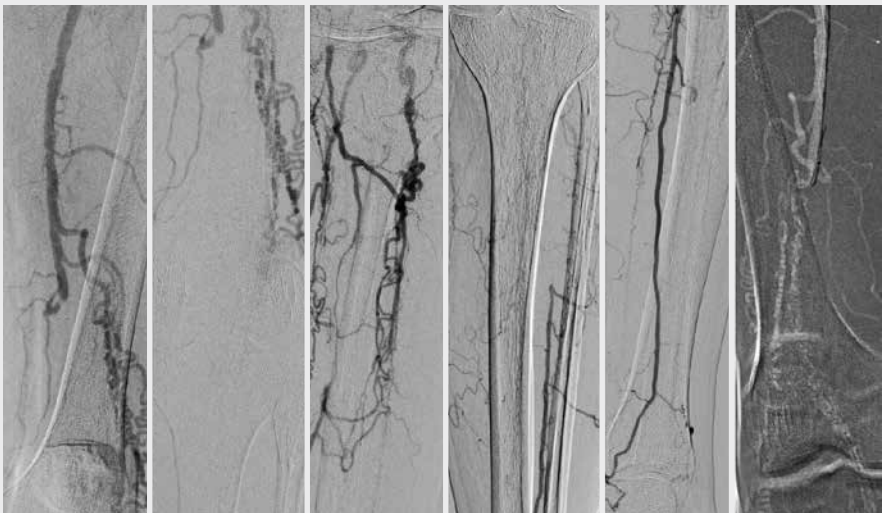
- Supera Interwoven Nitinol stent (ABBOTT)



Case 75 – LEI 31: male, 68 years (R-H)

Occlusion left popliteal artery**Operators:** A. Schmidt, M. Ulrich**Clinical data:** PAOD Rutherford 4, severe claudication left and rest-pain, walking capacity 20 m, ABI left 0.43
Failed recanalization attempt left, elsewhere**Risk factors:** Arterial hypertension, hyperlipidemia, nicotine abuse**Procedural steps:**

- 1. Right groin and cross-over approach**
 - Judkins Right 5F diagnostic catheter (CORDIS/CARDINAL HEALTH)
 - 0.035" SupraCore guidewire 30 cm (ABBOTT)
 - 7F-40 cm Balkin Up&Over sheath (COOK)
- 2. Second attempt of guidewire passage of the occlusion from antegrade**
 - Visions PV 0.035" Digital IVUS catheter (VOLCANO-PHILIPS)
- 3. In case of failure to pass with a GW from antegrade**
 - GoBack crossing catheter (UPSTREAM PERIPHERAL)
or retrograde approach via peroneal artery:
 - 21 Gauge 9 cm needle (B.Braun)
 - 0.018" V-18 Control GW, 300 cm (BOSTON SCIENTIFIC)
 - 0.018" CXC support catheter, 90 cm (COOK)
- 4. Laser atherectomy**
 - 7F Turbo Power Laser with Turbo Elite 2.3 mm catheter (PHILIPS)
- 5. PTA with DCBs**
 - 5.0/80 mm and 6.0/80 mm iLuminor DCB (iVASCULAR)
- 6. Stenting**
 - Supera Interwoven Nitinol stent in case of severe recoil (ABBOTT)



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