Radial to Peripheral Interventions

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CVI Cardiac & Vascular Interventions of New Jersey, LLC

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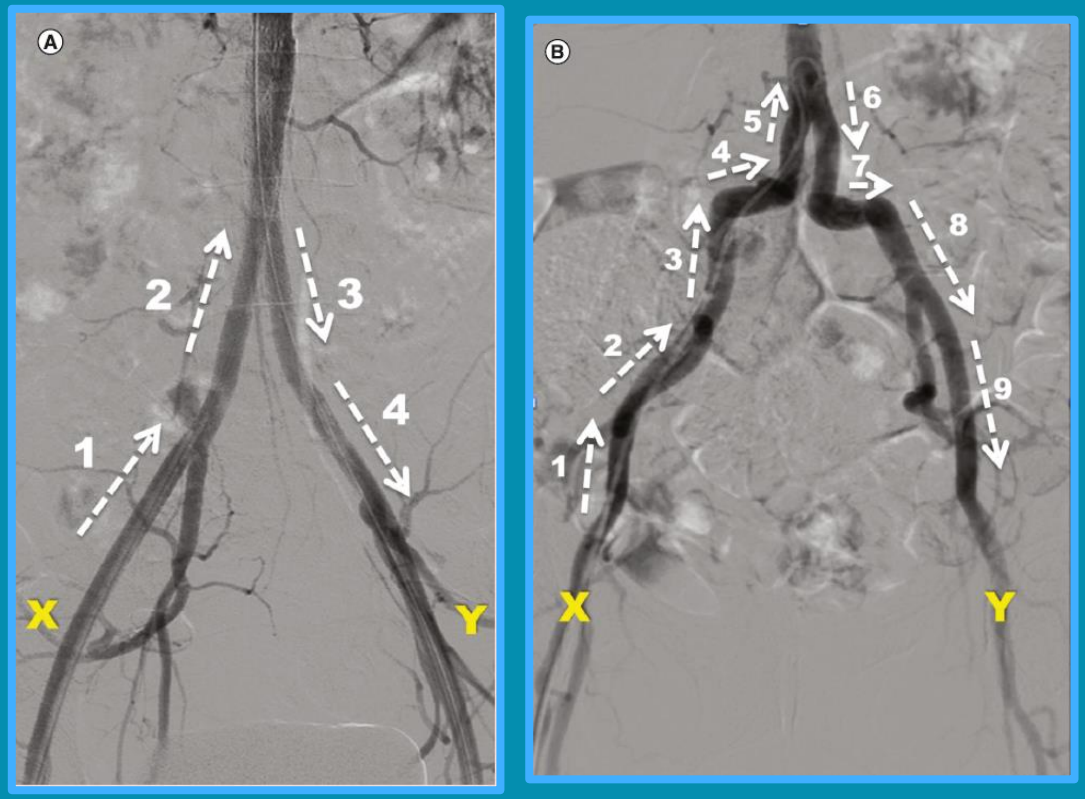
Disclosures

- CSI
- Boston Scientific
- Shockwave Medical
- Abbott
- Philips Medical
- Terumo Medical
- Cordis

Why? Technical Considerations

Iliac Artery

- Tortuous Iliac Artery
- Steep Iliac Arch
- Previous interventions, kissing Iliac stents
- Aorta-fem bypass



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Common Femoral Artery

- Hostile Groin
- Recent surgery/endovascular intervention of the common femoral artery
- Need to intervene on bilateral

Why? Patient Orientated Consideration

Bleeding Risk

- Obesity
- Thrombocytopenia
- Comorbid disease requiring anticoagulation

Patient Factors

- Severe back pain
- Heart Failure
- Body Habitus
- Patient preference

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Why

- Patient Satisfaction
  - 80 % of patients who underwent both access methods strongly preferred radial.[1,2]
- Increase Efficiency
  - Radial access resulted in 65% reduction in time to discharge [1]
  - Improve turnover with a 95% reduction in time to ambulation from 2-3 hours to minutes [1,3]

Cooper CJ, El-Shiekh RA, Cohen DJ, et al. Effect of transradial access on quality of life and cost of cardiac catheterization: A randomized comparison. Am Heart J. 1999 Sep;138(3 Pt 1):430–6.
2. Kok MM, Weernink MGM, von Birgelen C, Fens A, van der Heijden LC, van Til JA. Patient Preference for Radial versus Femoral Vascular Access for Elective Coronary Procedures: The PREVAS Study. Catheter. Cardiovasc. Interv. 2018;91(1):17–24. 3. Kern MJ. Radial Access in Practice. Tips for starting a successful program. Cardiac Interventions Today. September/October 2015.
4. Mitchell MD, Hong JA, Lee BY, et al. Systematic Review and Cost–Benefit Analysis of Radial Artery Access for Coronary Angiography and Intervention. Circ Cardiovasc Qual Outcomes. 2012;5:454–462.
5. Ansaarie I, Goldfaden RF, Hardy J, et al. A Retrospective Cohort Study to Evaluate the Efficacy, Safety, and Cost of MáLEI via Transradial vs Transfemoral Peripheral Revascularizations. Vascular Disease Management. 2021.

Why

- Reduce the Total Care of Cost
  - A systematic review of 14 randomized controlled trials found radial access lowered hospital costs [4]
  - Saved $1,116 per procedure in duration of stay costs compared to femoral access [5]

Cooper CJ, El-Shiekh RA, Cohen DJ, et al. Effect of transradial access on quality of life and cost of cardiac catheterization: A randomized comparison. Am Heart J. 1999 Sep;138(3 Pt 1):430–6.
2. Kok MM, Weernink MGM, von Birgelen C, Fens A, van der Heijden LC, van Til JA. Patient Preference for Radial versus Femoral Vascular Access for Elective Coronary Procedures: The PREVAS Study. Catheter. Cardiovasc. Interv. 2018;91(1):17–24. 3. Kern MJ. Radial Access in Practice. Tips for starting a successful program. Cardiac Interventions Today. September/October 2015.
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Reduction in Bleeding Complications

2015	8,404 patients at 78 centers Reductions in major bleeding and all cause mortality Stroke risk was not statistically significant where each group reported the same 0.4% rate	MATRIX
2012	STEMI TRA (n = 500) vs. TFA (n = 501) 62% Reduction of Access site bleeding complications with TRA vs. TFA	RIFLE-STEACS
2011	TRA n = 3507 TFA n =3514 STEMI radial showed 40% Reduction in primary outcome STEMI/ACS radial showed 63% Reduction in Major Vascular Complications	RIVAL
2008	Retrospective analysis of 38,872 patients TRA showed 50% Reduction in Transfusion Rate TRA reduced 1yr Mortality from 3.9% to 2.8%	MORTAL

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*The Association Of Arterial Access Site At Angioplasty With Transfusion And Mortality The M.O.R.T.A.L Study: (Mortality benefit of Reduced Transfusion After PCI via the Arm or Leg); Alex J Chase, Eric B Fretz, William P Warburton, W Peter Klinke, Ronald G Carere

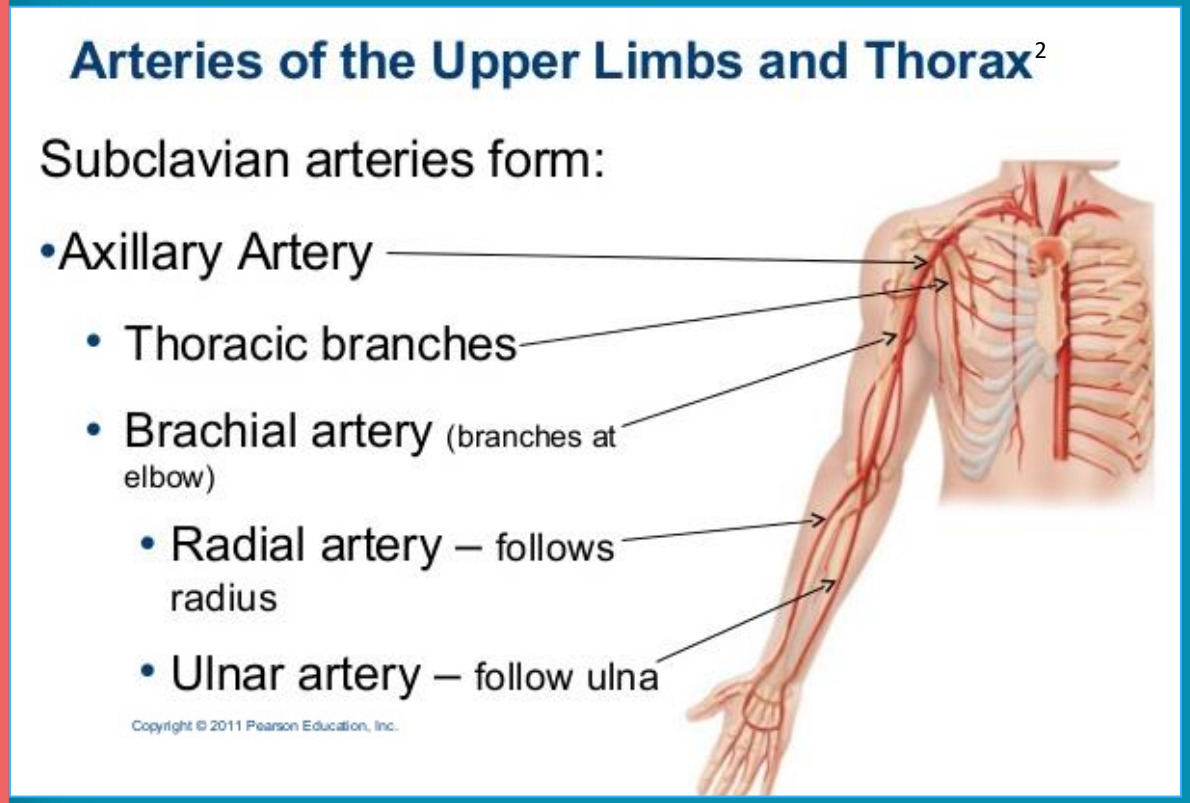
Effects of Radial Versus Femoral Artery Access in Patients With Acute Coronary Syndromes With or Without ST-Segment Elevation. Shamir R. Mehta, MD, MSC, Sanjit S. Jolly, MD, MSC

Radial Versus Femoral Randomized Investigation in ST-Segment Elevation Acute Coronary Syndrome The RIFLE-STEACS (Radial Versus Femoral Randomized Investigation in ST-Elevation Acute Coronary Syndrome) Study. Enrico Romagnoli, MD, PHD, Giuseppe Biondi-Zoccai, MD,† Alessandro Sciahbasi, MD

Potential for R2P

- Lower Risk of Access Site Complications
- Early Ambulation
- Improve turnover time
- No concern for femoral closure device failure
- Allow Treatment of Bilateral Disease

UPPER EXTREMITY ACCESS



- **Radial** artery is superficial
  The transradial approach is safe to propose for ... patients, with a low conversion rate to transfemoral approach[1]
- **Ulnar** artery provides duplicate blood flow to the hand
- **Brachial** artery is the distal continuation of the axillary artery and itself separates distally into the ulnar and radial arteries. . . The brachial approach is an alternative to radial, needs no special premedication and can be performed using the same or even larger adjunctive devices (sheath and catheters)[1]
- **Axillary** artery is the direct continuation of the subclavian artery. Axillary artery cannulation is useful for obtaining central arterial access in patients with severe peripheral vascular disease in the lower and upper extremities, although it is very rarely used today[1]

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1. Jasmin Čaluk (2011). Procedural Techniques of Coronary Angiography, Advances in the Diagnosis of Coronary Atherosclerosis, Prof. Suna Kirac (Ed.), ISBN: 978-953-307-286-9.
2. Pearson Education, Inc © 2011. Arteries of the Upper Limbs and Thorax. Retrieved from https://image.slidesharecdn.com/circulationonline-140123151723-phpapp01/95/circulation-online-15-638.jpg?cb=1390490496. Accessed September 13, 2019.

How

- L radial preferred
- US Access Highly Recommended
- Start with Glidesheath slender or Rain sheath
- Adminster Cocktail

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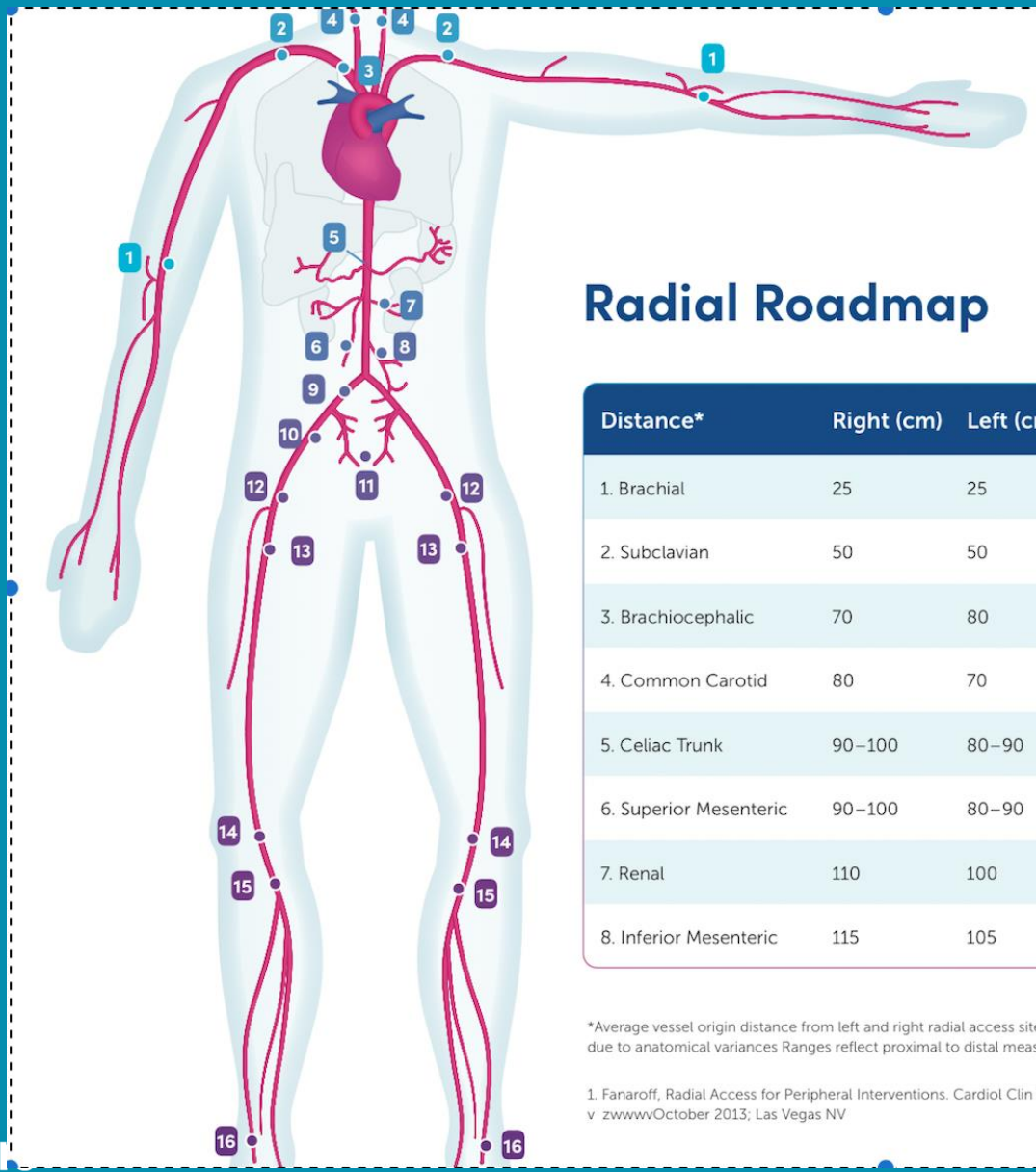
How

- Advance pigtail over J wire change to Glideire 400, 450 cm length
- Rotate pigtail and advance glidewire into descending aorta
- Perform Abdominal Angiogram use road map to avoid entering internal iliac
- Advance R2P Destination, Brite Tip Radianz or Sublime



Radial Roadmap

Distance*	Right (cm)	Left (cm)
1. Brachial	25	25
2. Subclavian	50	50
3. Brachiocephalic	70	80
4. Common Carotid	80	70
5. Celiac Trunk	90–100	80–90
6. Superior Mesenteric	90–100	80–90
7. Renal	110	100
8. Inferior Mesenteric	115	105

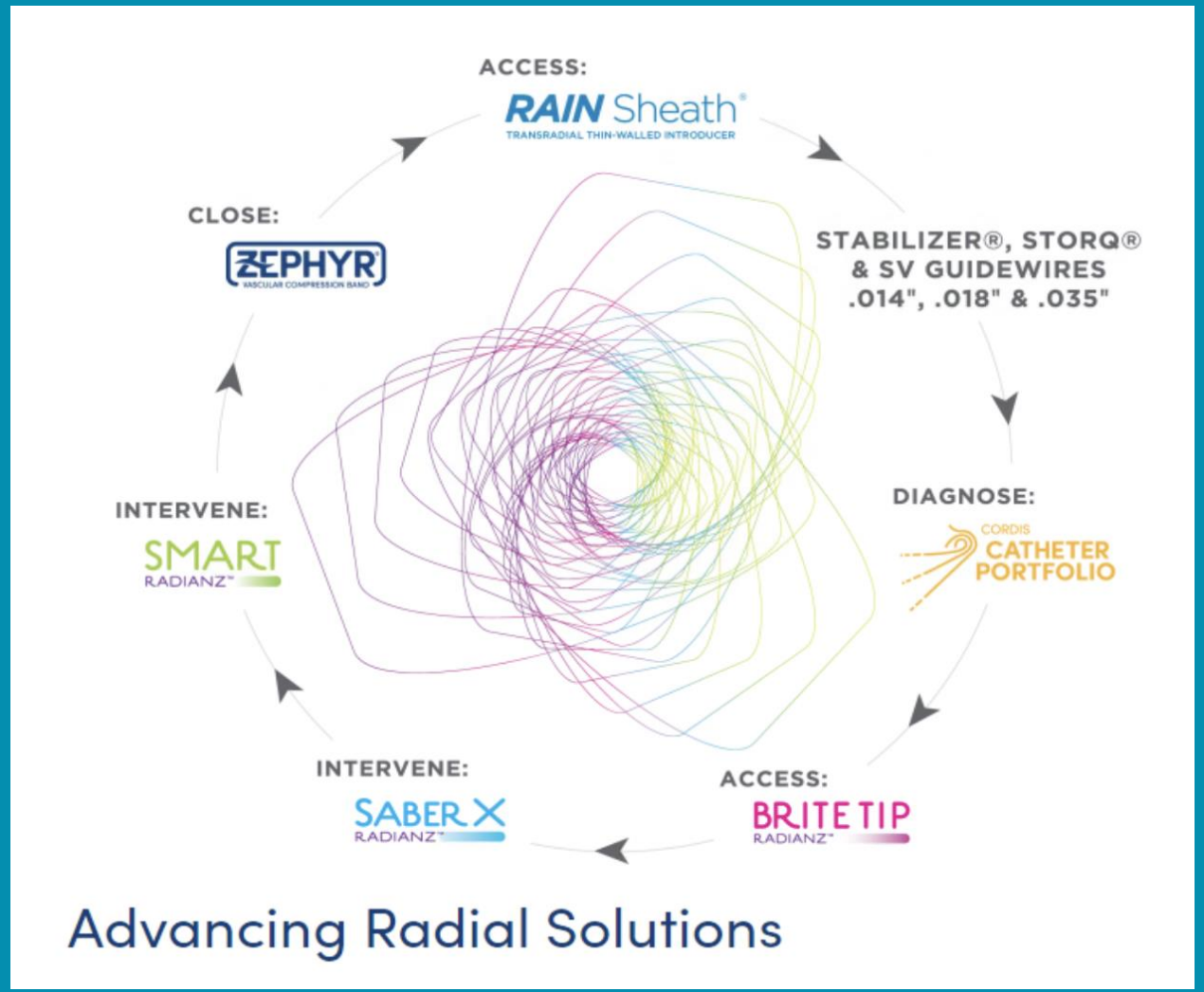
Distance*	Right (cm)	Left (cm)
9. Common Iliac	130	120
10. External Iliac	140	130
11. Uterine	140	130
12. Common Femoral Artery (CFA)	145	135
13. Superficial Femoral Artery (SFA)	150	140
14. Popliteal	190	180
15. Tibioperoneal Trunk	200–210	190–200
16. Dorsalis Pedis	210–240	200–230

*Average vessel origin distance from left and right radial access sites based on 5'11" (180.34cm) patient height. All measurements are approximations and may vary due to anatomical variances Ranges reflect proximal to distal measurements of the target vessels.[1]

1. Fanaroff, Radial Access for Peripheral Interventions. Cardiol Clin 9 (2020) 53–61 Chowdhury, Contemporary Use of Radial to Peripheral, CTOCM, 2021 (1)[41] vvff v zwwwvOctober 2013; Las Vegas NV

Radial Equipment - Cordis

CORDIS Arsenal



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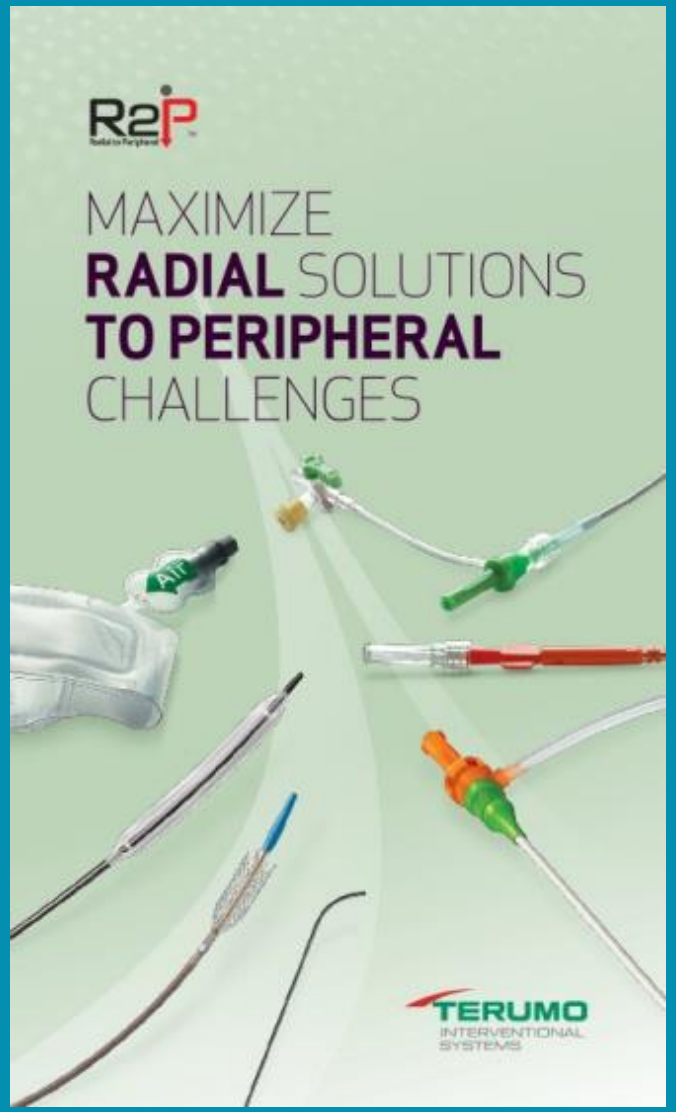
Radial Eqiupment - Terumo



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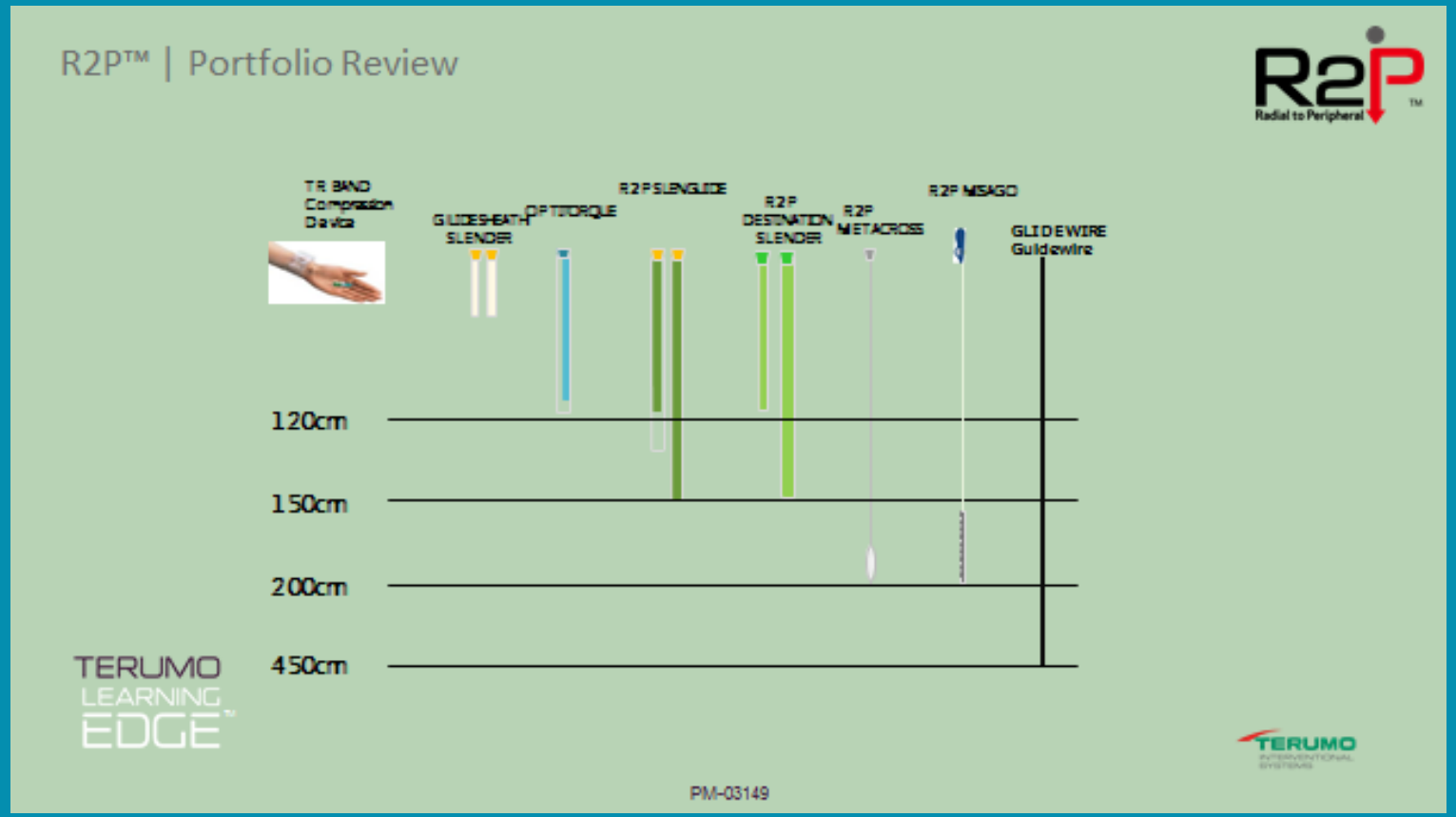
Terumo Portfolio



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Radial Equipement - Surmodics

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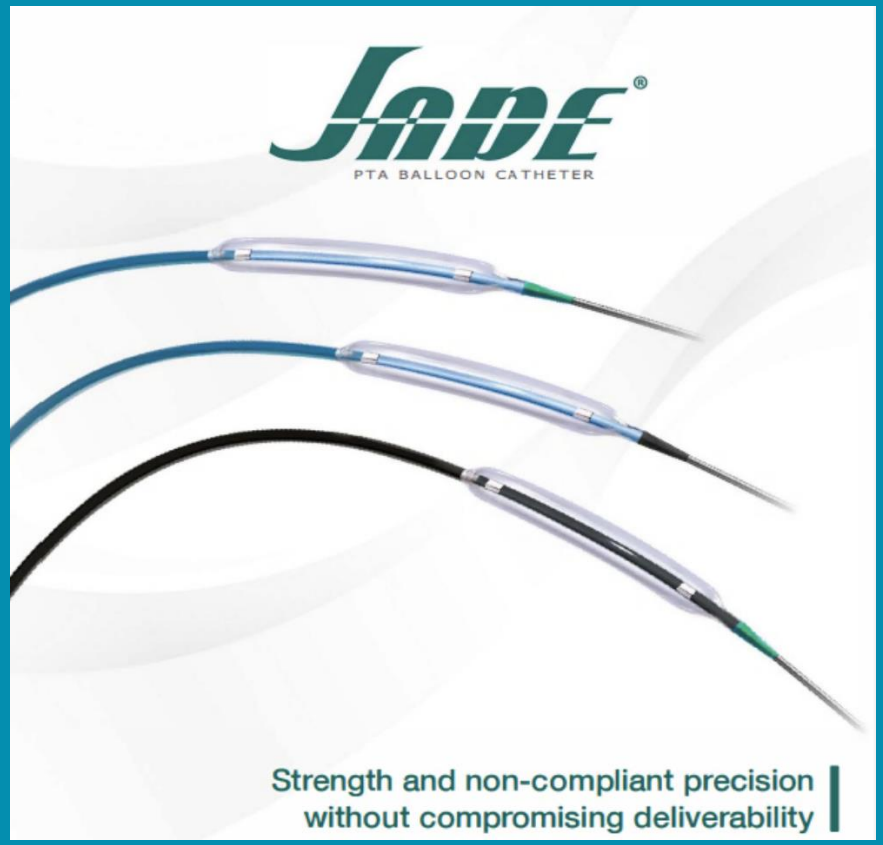
Radial Equipment – CSI/Abbott



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Simple

Same user-friendly orbital atherectomy platforms - Diamondback 360®, Stealth 360®, and Diamondback 360® Exchangeable Series

Low-Profile

5Fr compatible sheath for ALL extended length devices

Long

180 and 200cm working catheter lengths

Supportive

Nylon sheath with lubricious additive and increased filar count on driveshaft

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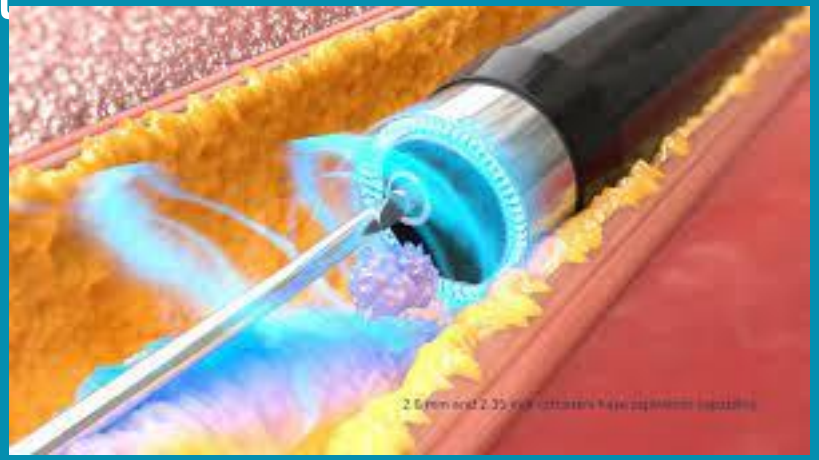
Other Notable Devices

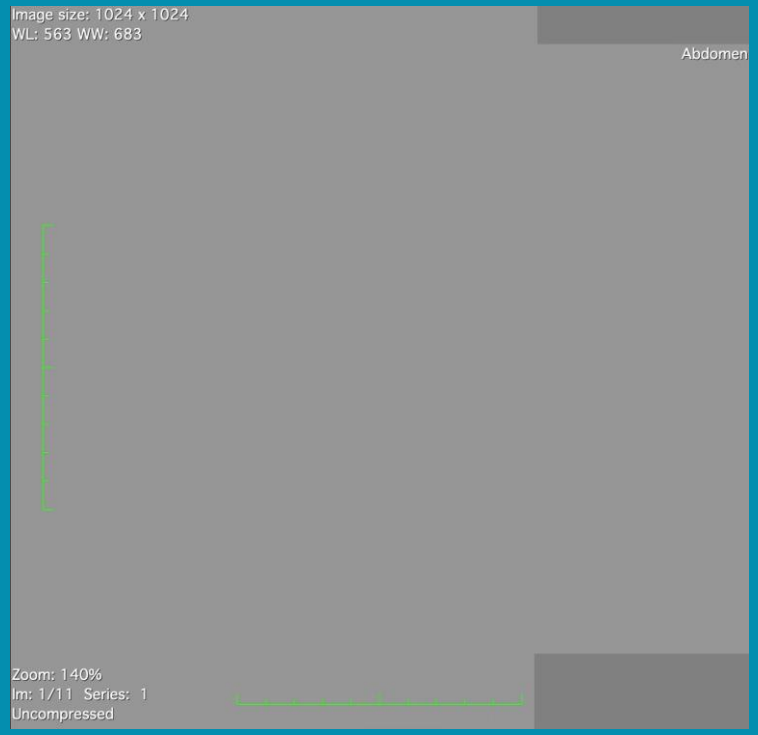
- Phillips Laser
- Angiodynamics Laser
- Boston Sci. Ranger DCB 150cm
- Admiral Medtronic – 200cm shaft



Case 1

- 61 y/o male with CAD s/p PCI, s/p MV repair, with severe disabling claudication R > L. Symptoms have progressed and affect quality of life.
- 70 pack history

Initial angiography



- Severe R Common Iliac Artery Stenosis

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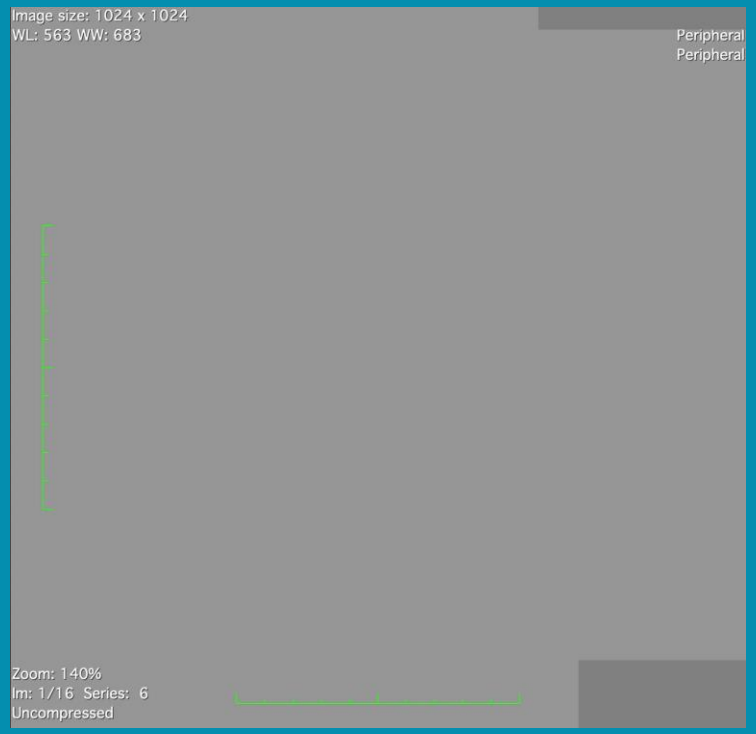
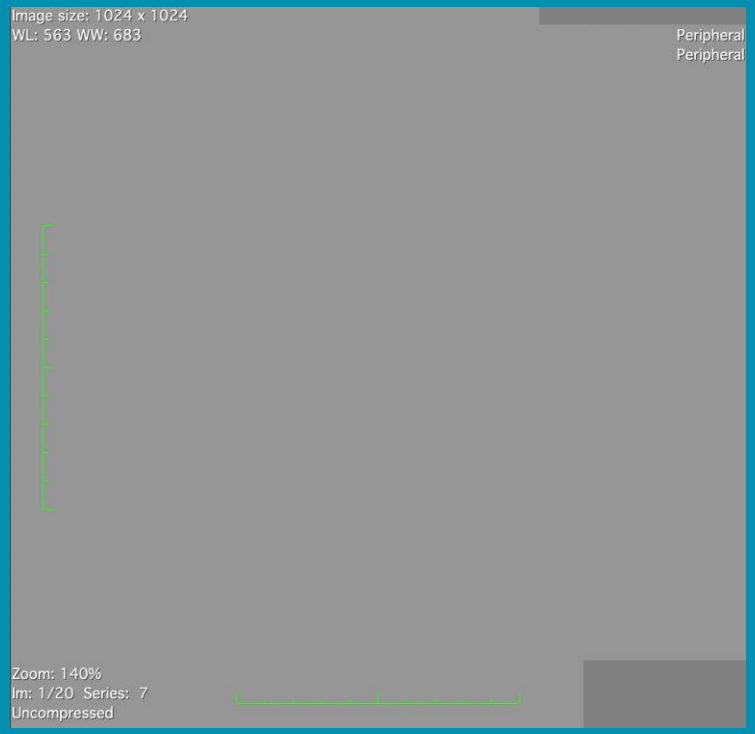
Initial LLE angiography

Severe L SFA disease





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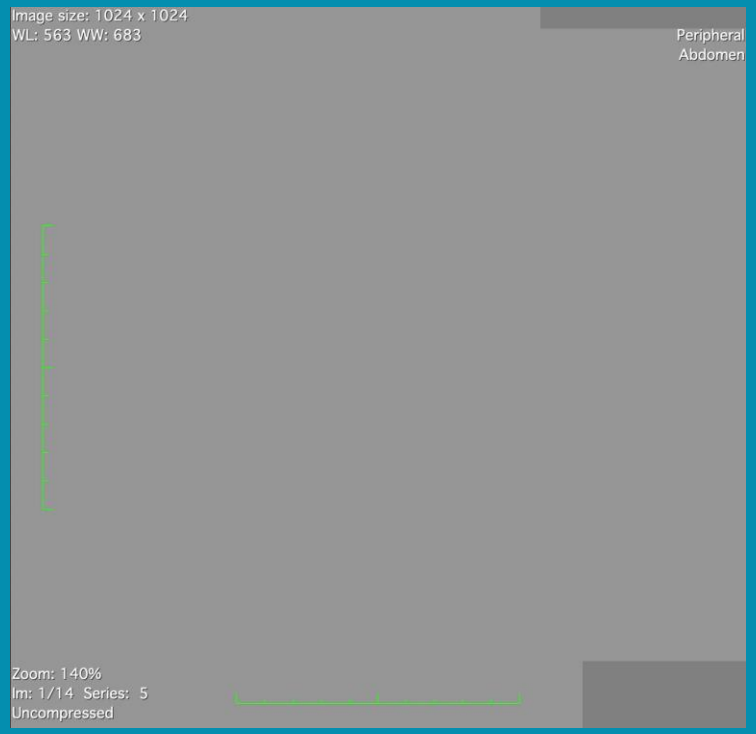
Approach

- PTA and Balloon expandable stent placement of R Common Iliac
- Than advance sheath to L CFA and perform orbital atherectomy and PTA of SFA and bailout stenting if necessary

Final Iliac angiogram



- Post PTA and balloon expandable stent

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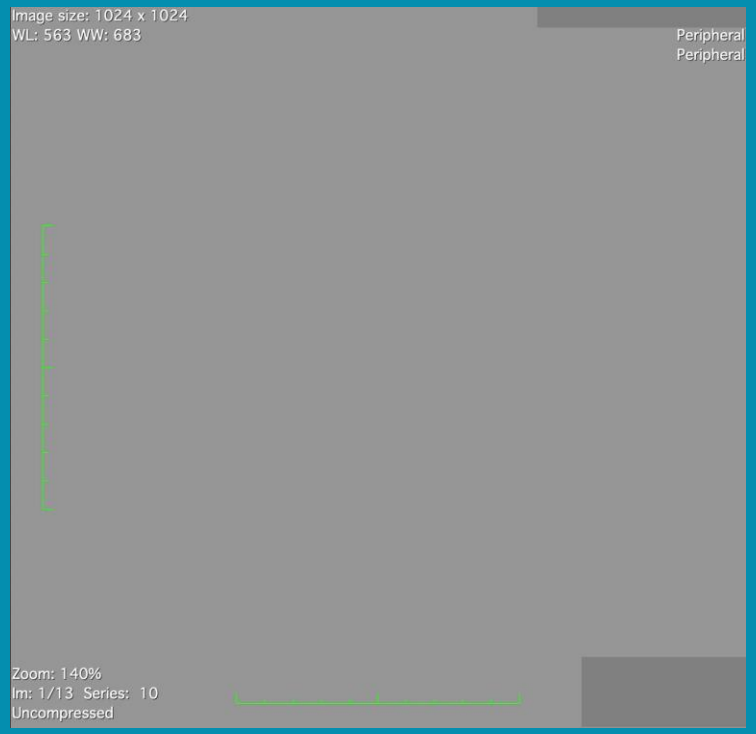
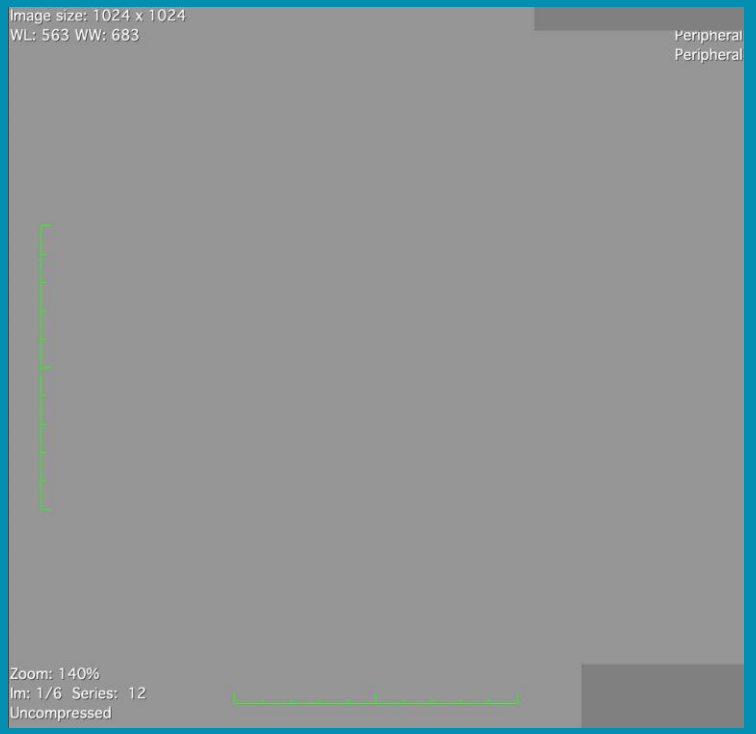
Post Orbital atherectomy and Pta





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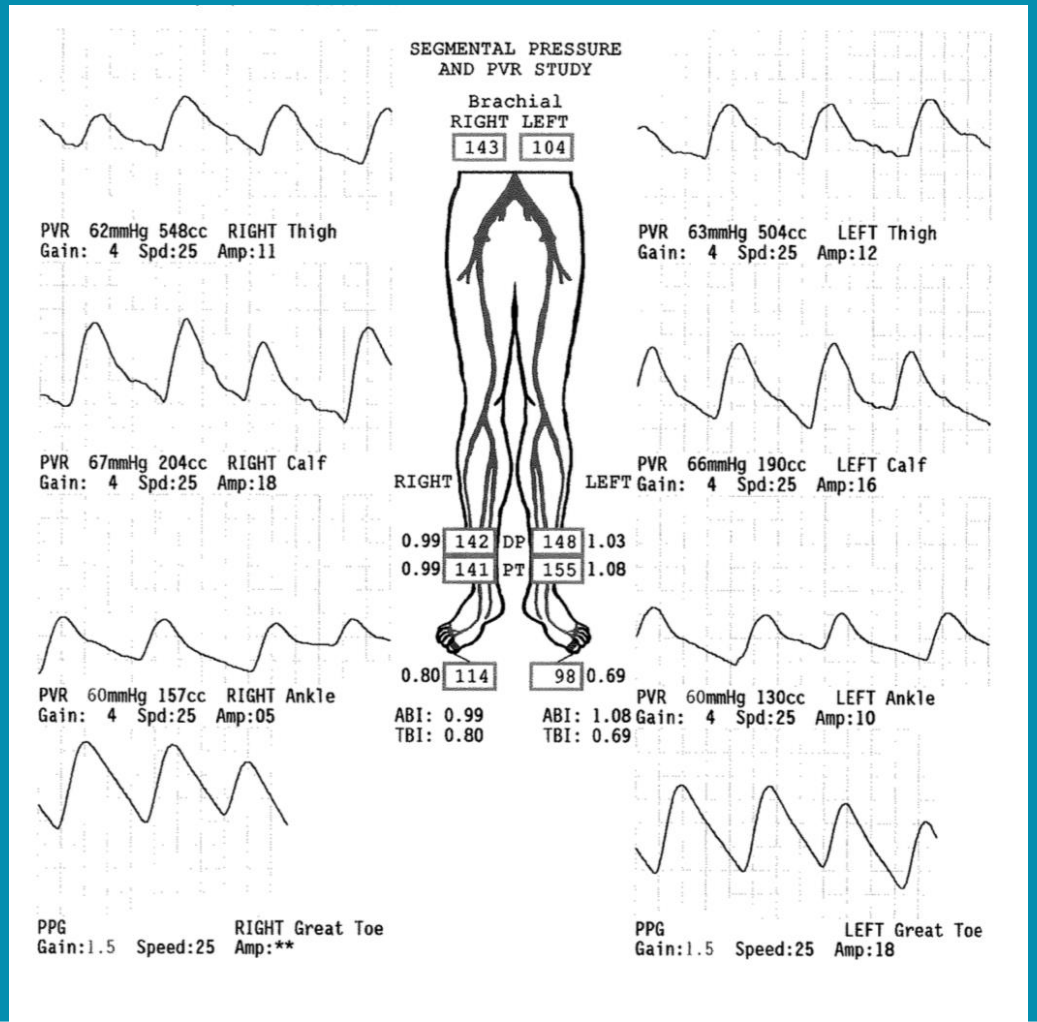
Post procedure abi/pvr



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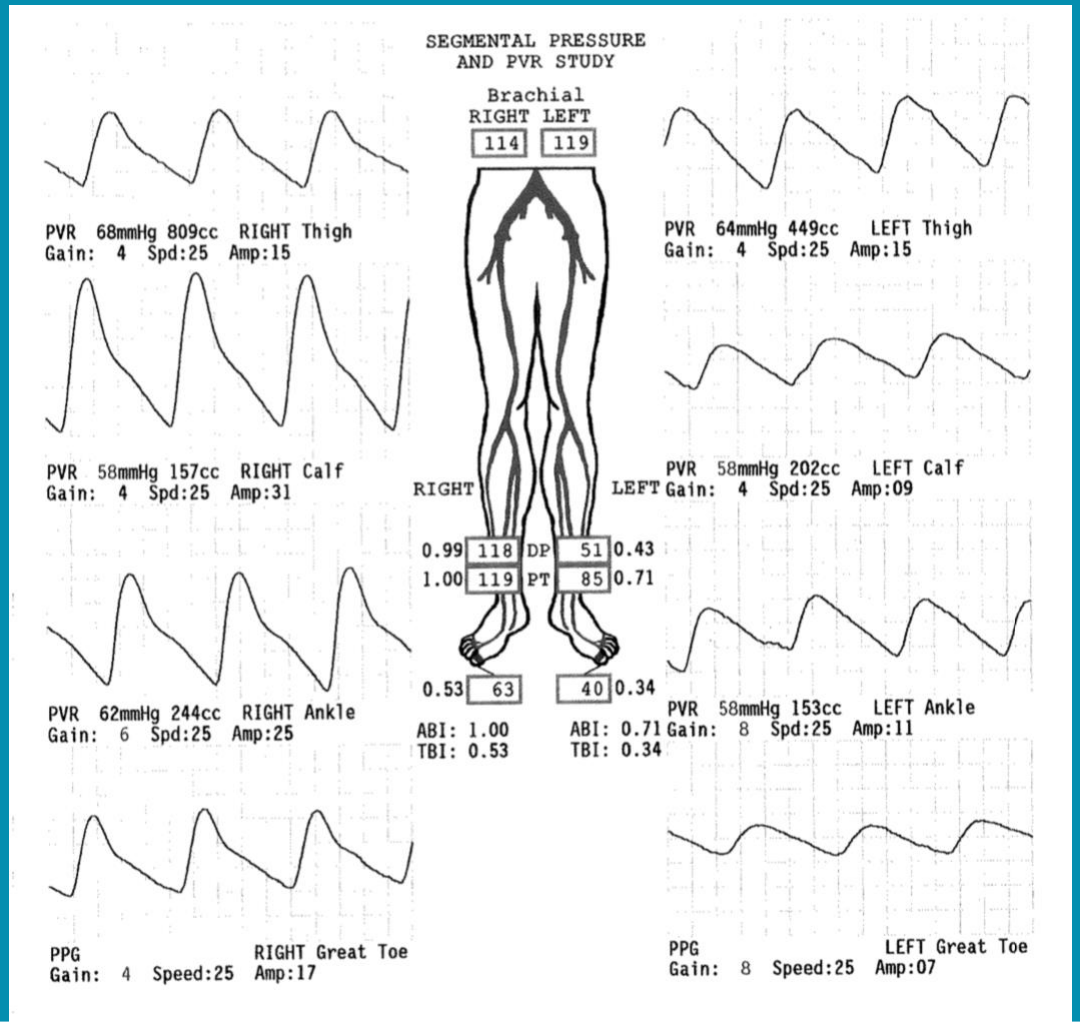
Case 2

- 77 y/o female with CAD s/p PCI , AS, no smoker with severe discomfort in LLE with minimal exertion

Pre procedure abi/pvr

c/w LLE obstructive disease



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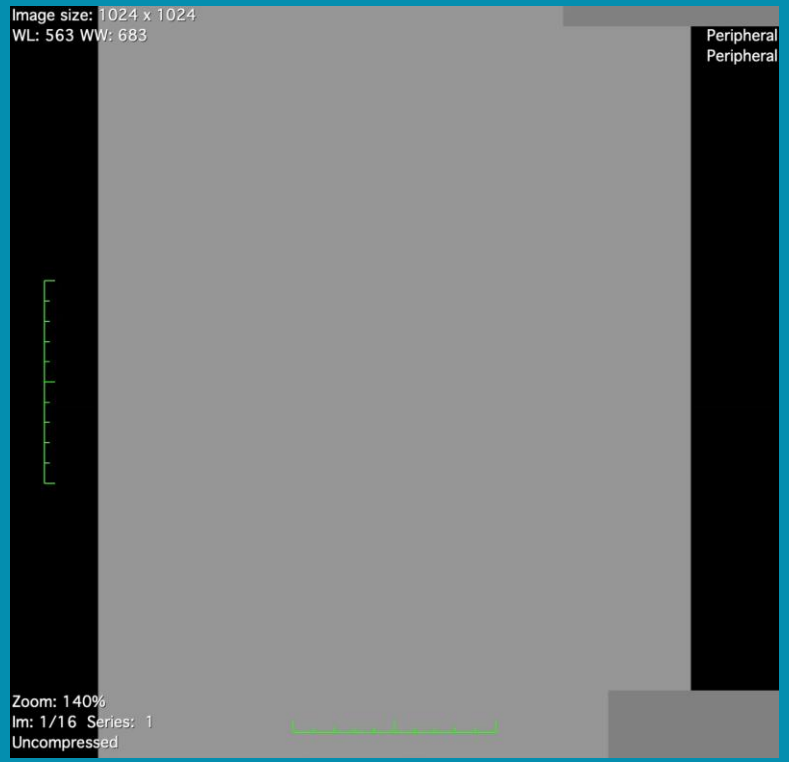
Initial angiography

high grade calcified L common iliac lesion, steep iliac bifurcation



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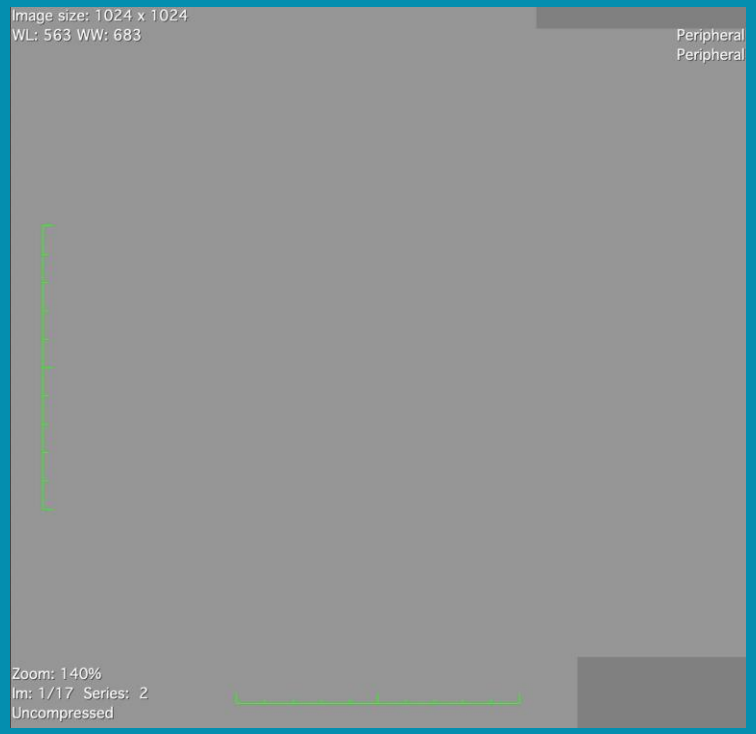
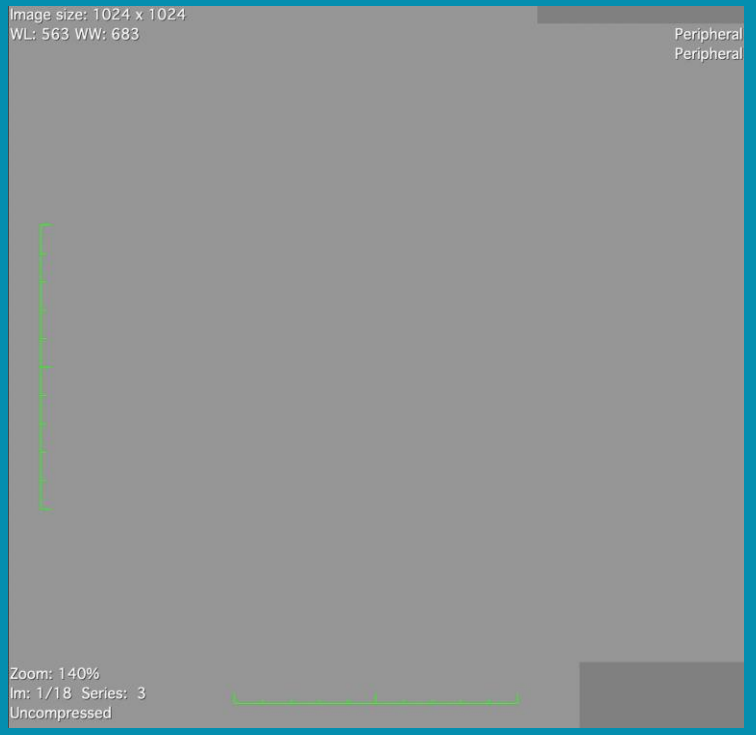
LLE angiography

L ostial calcific occlusive SFA stenosis





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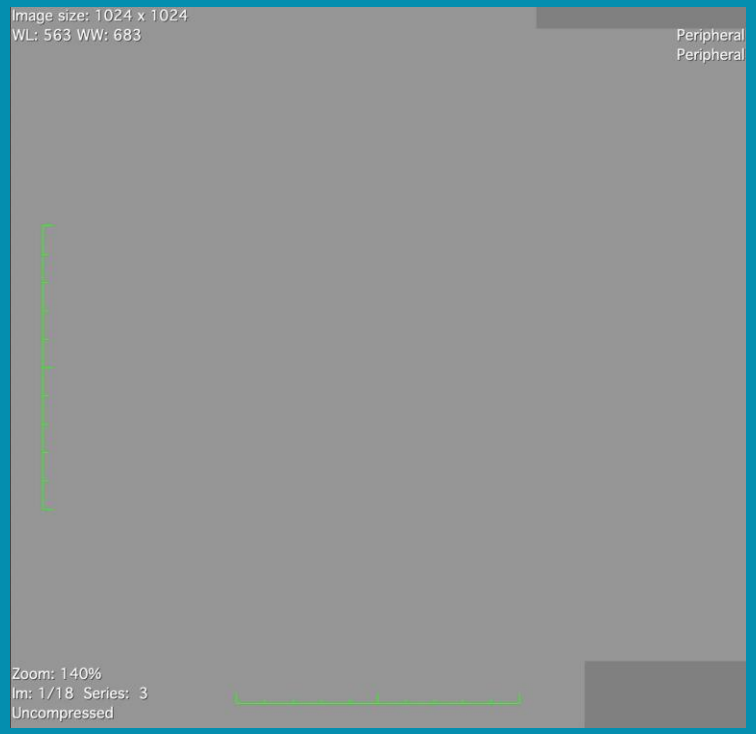
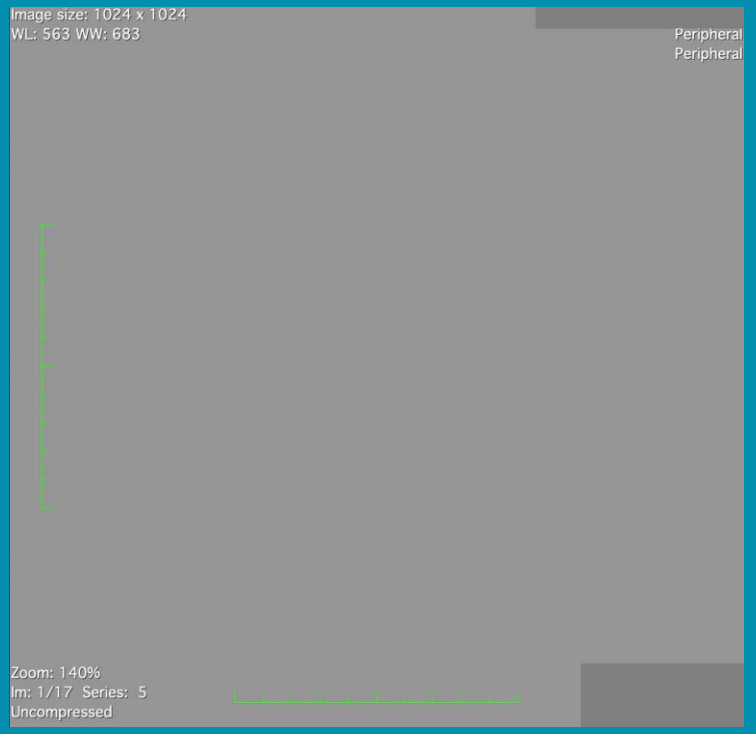
Initial angiography





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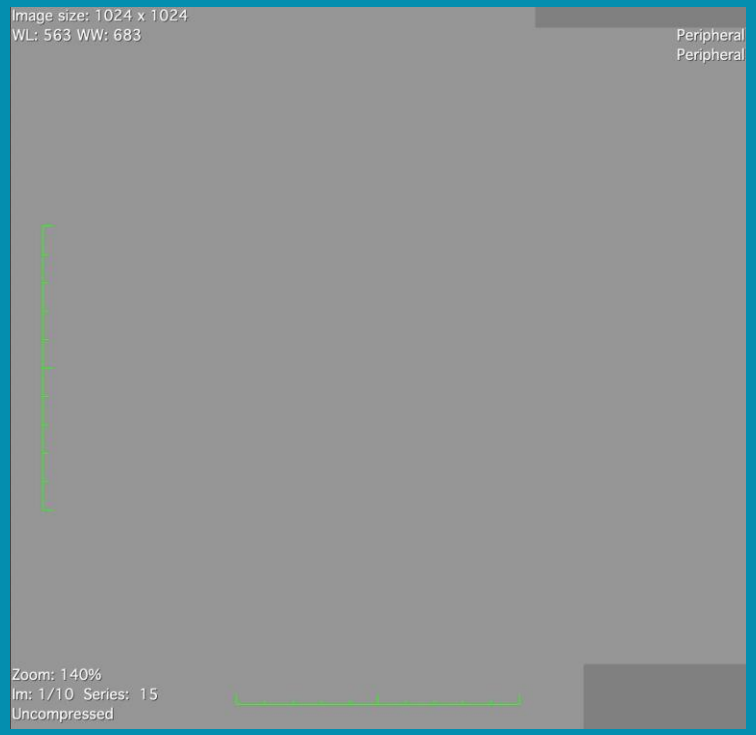
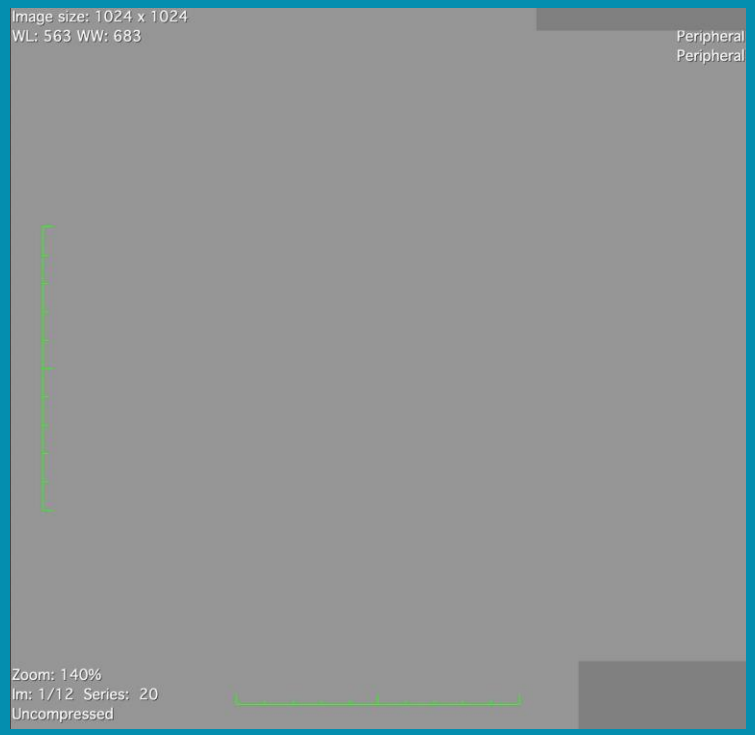
Approach

- Orbital atherectomy and PTA to Iliac
- Than Advance sheath into L common ilac artery and intervene on ostial SFA with orbital atherectomy and PTA
- Retract sheath than stent Iliac lesion

Post orbital atherectomy and PTA





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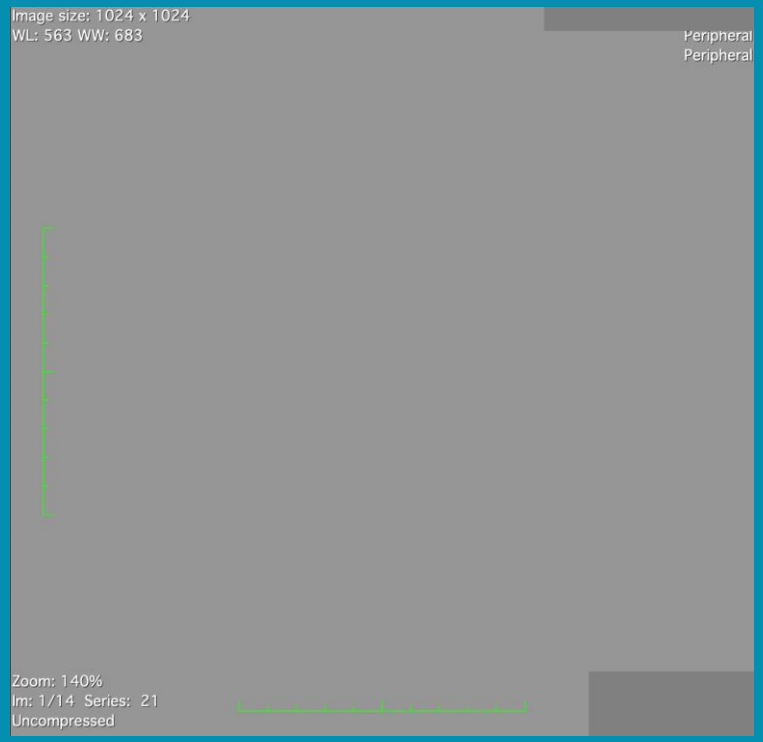
Final runoff angiogram



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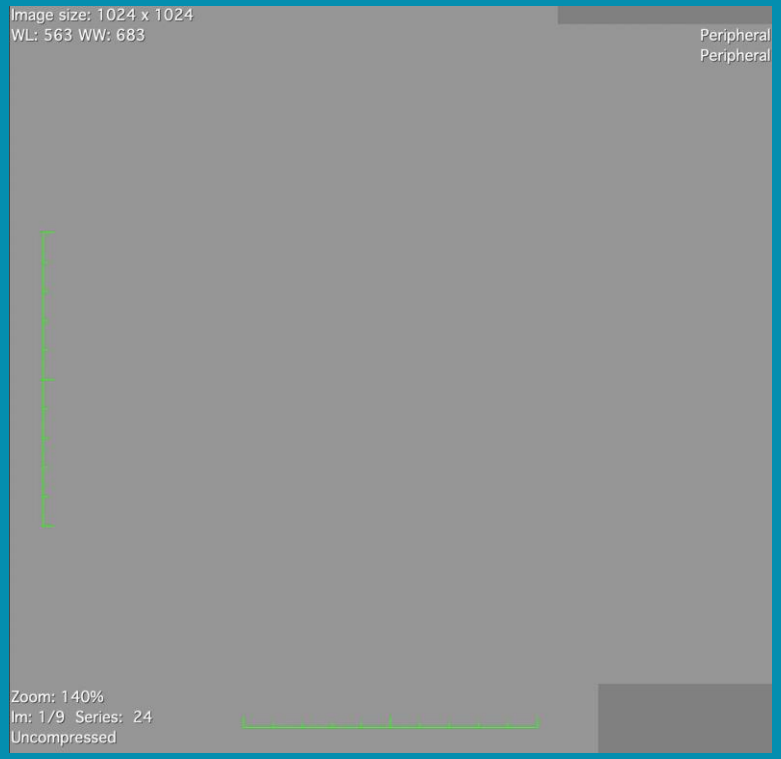
Final iliac angiogram

post balloon expandable stent placement



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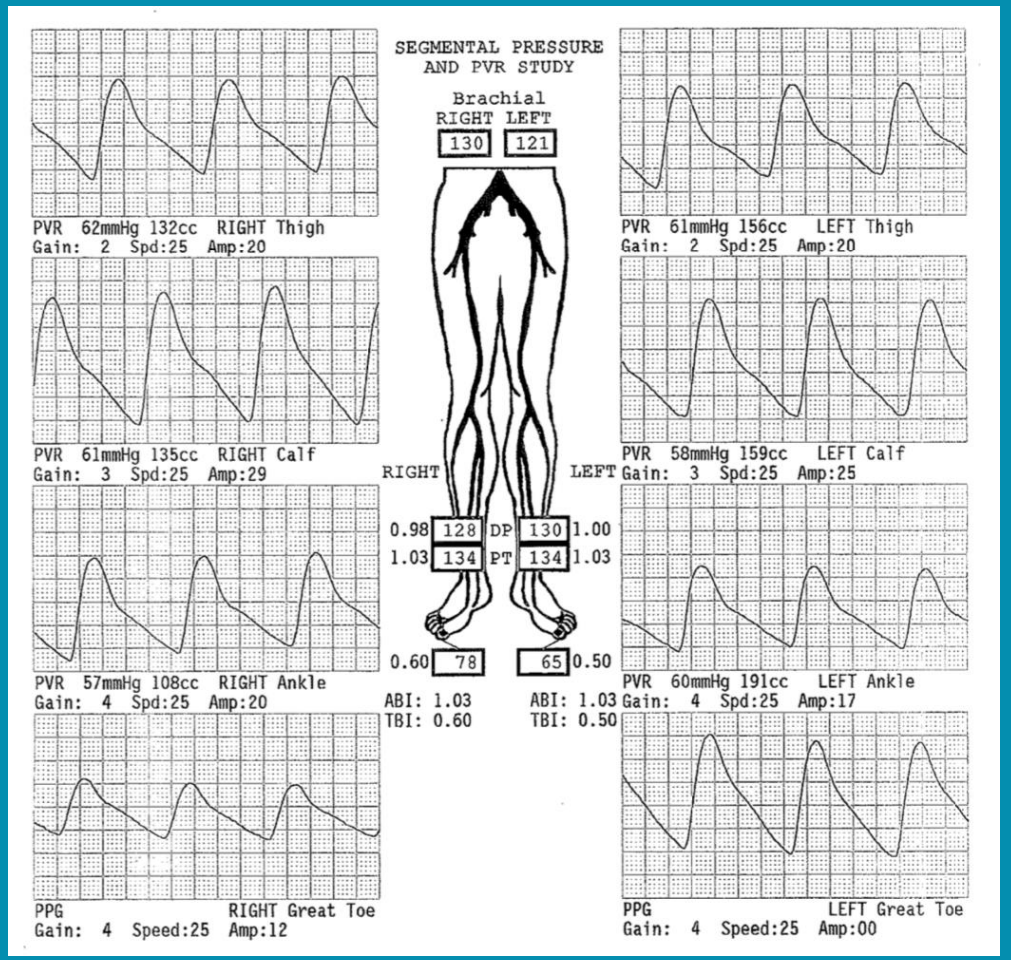
Post procedure abi/pvr



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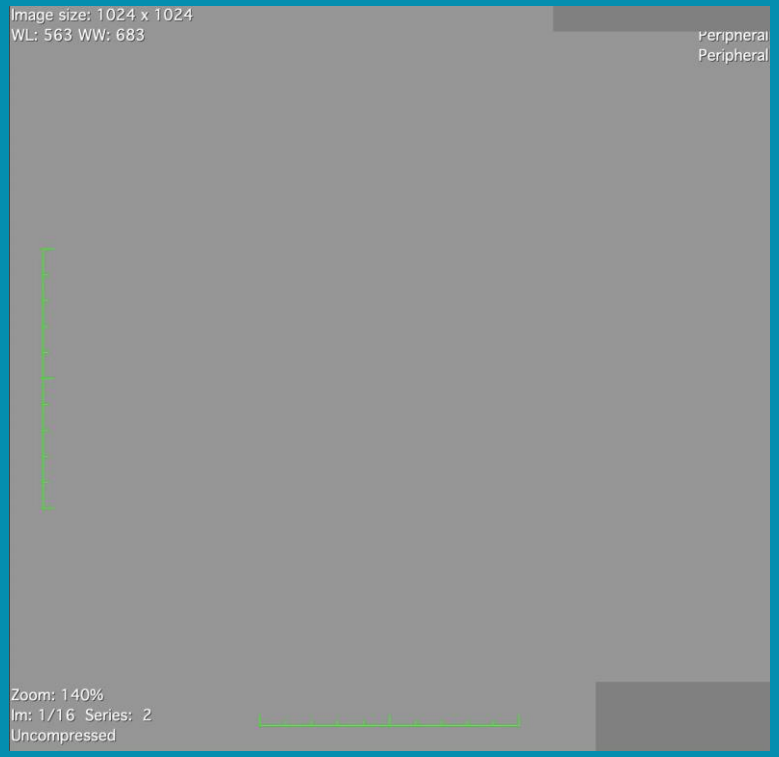
Case 3

- 66 year old male with CAD, HTN, HLD, 60 pack history quit 5 years ago with severe lifestyle disabling claudication R > L
- ABI 0.59 on R , L 0.73 with abnormal PVRs BL

Initial angiography

marked iliac tortuosity with steep angle



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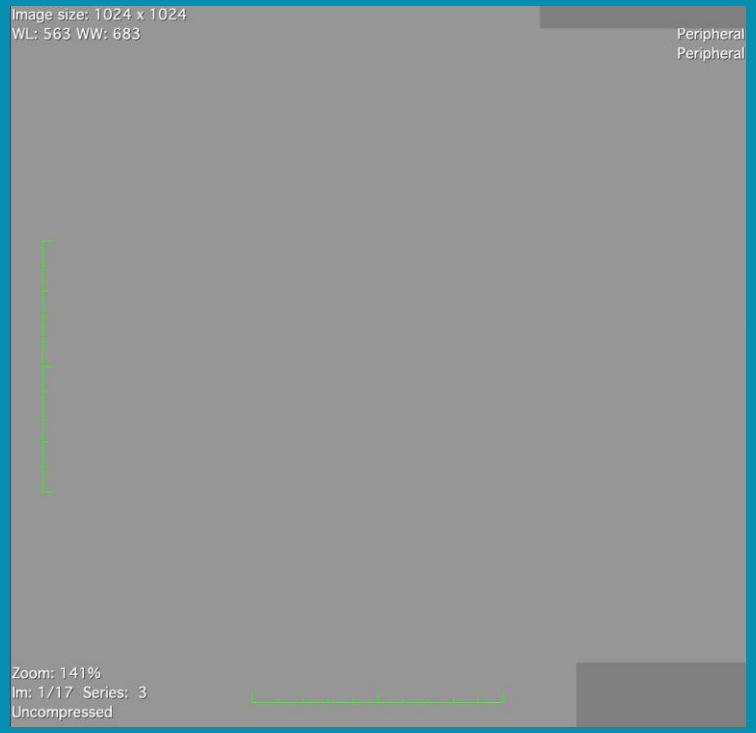
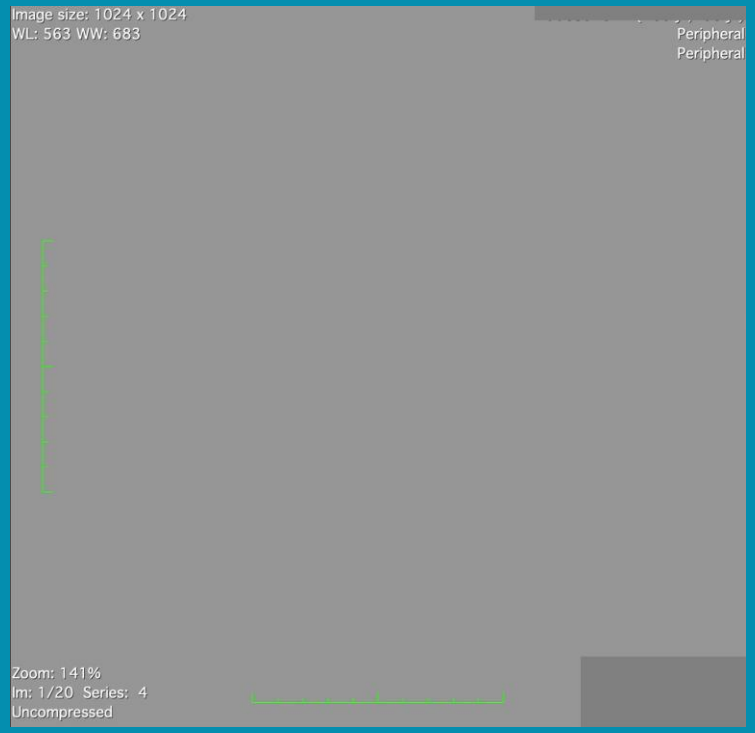
Initial angiography

severe calcific occlusive R proximal SFA disease, and mid L SFA disease





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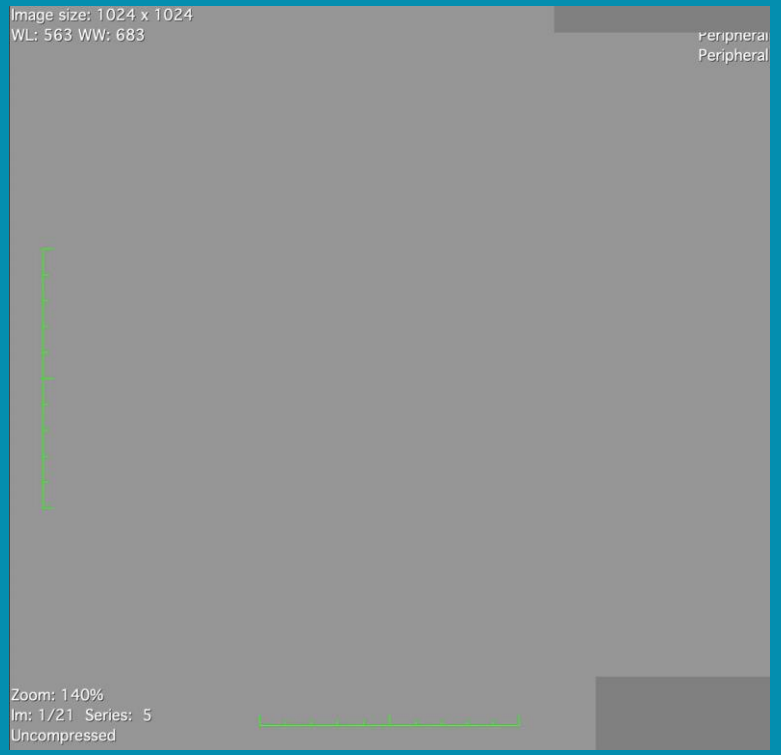
Initial angiography
Severe calcific R popliteal disease



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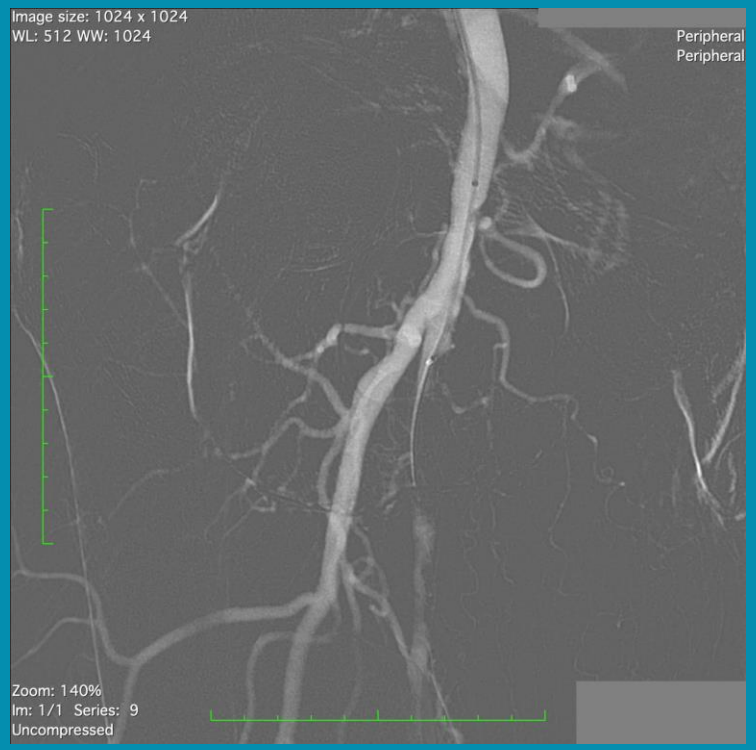
Approach



Cross with 0.18 command exchange for ViperWire Advance® , orbital atherectomy, PTA and bailout stenting if needed

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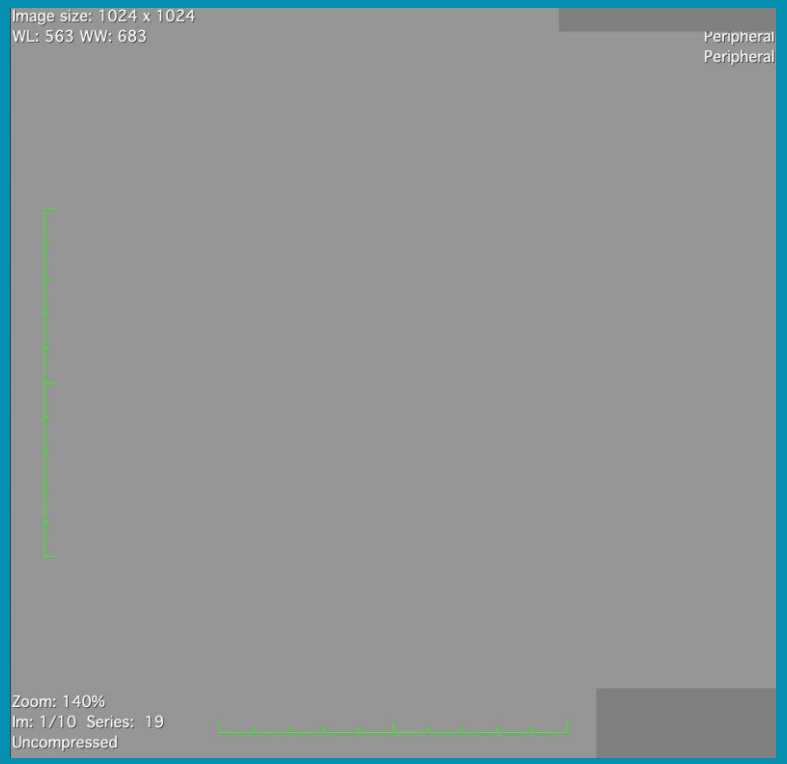
POST orbital atherectomy and PTA proximal sfa



- Dissection still present after prolonged balloon inflation

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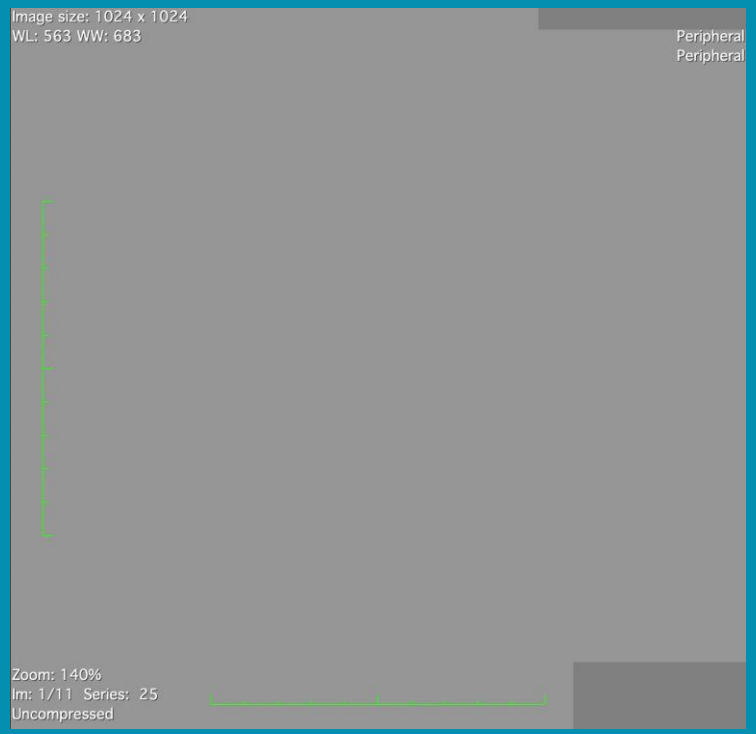
POST orbital atherectomy and PTA proximal sfa , and stenting



- Self Expanding Stent Deployed and post dilated

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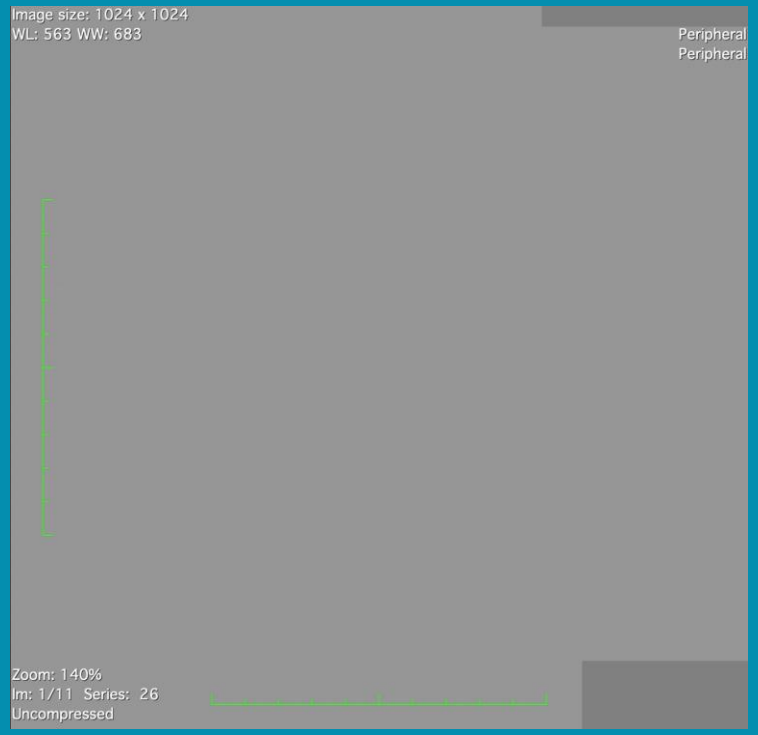
Final angiography



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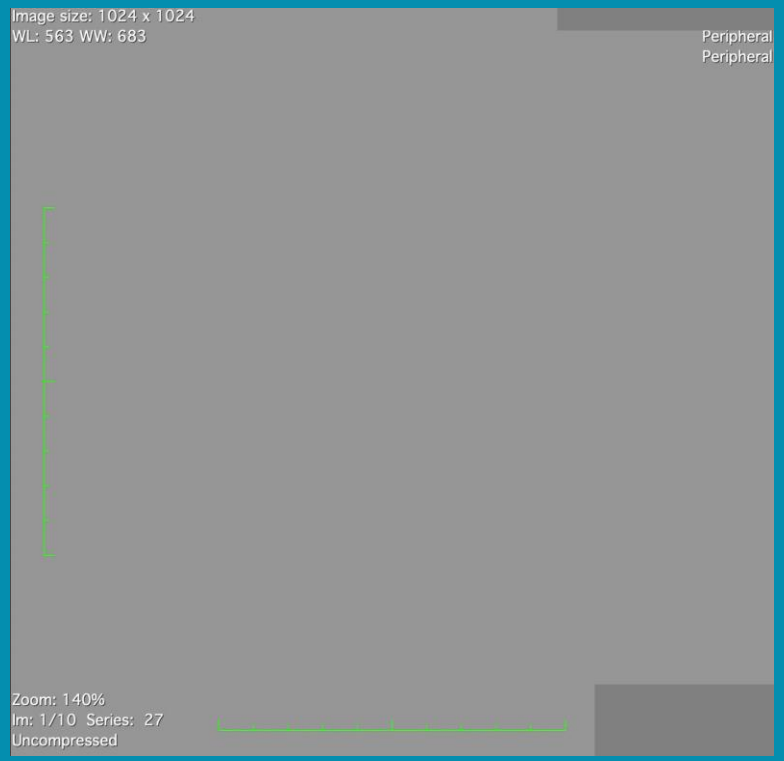
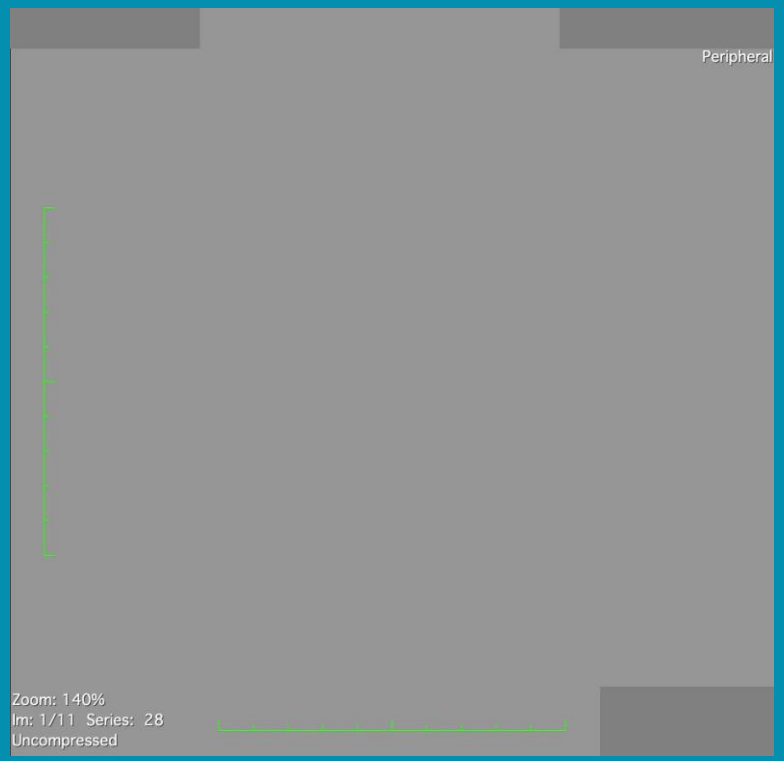
Final Angiography



- Post orbital atherectomy and PTA to popliteal artery

Cors at the Shore 2023

Final angiography



- Good run off no embolization

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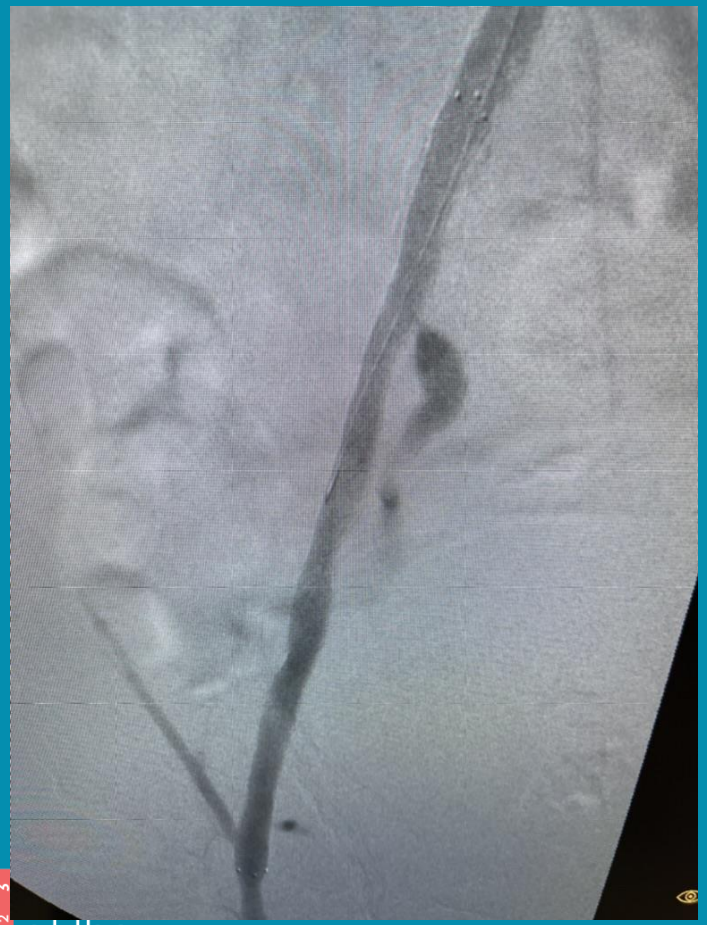
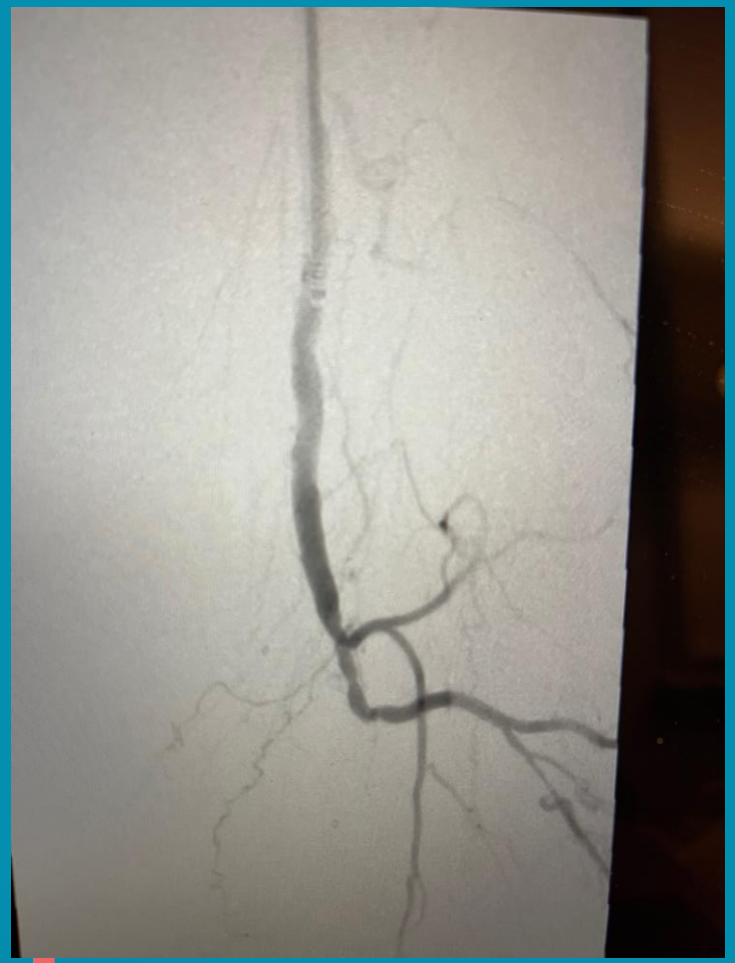
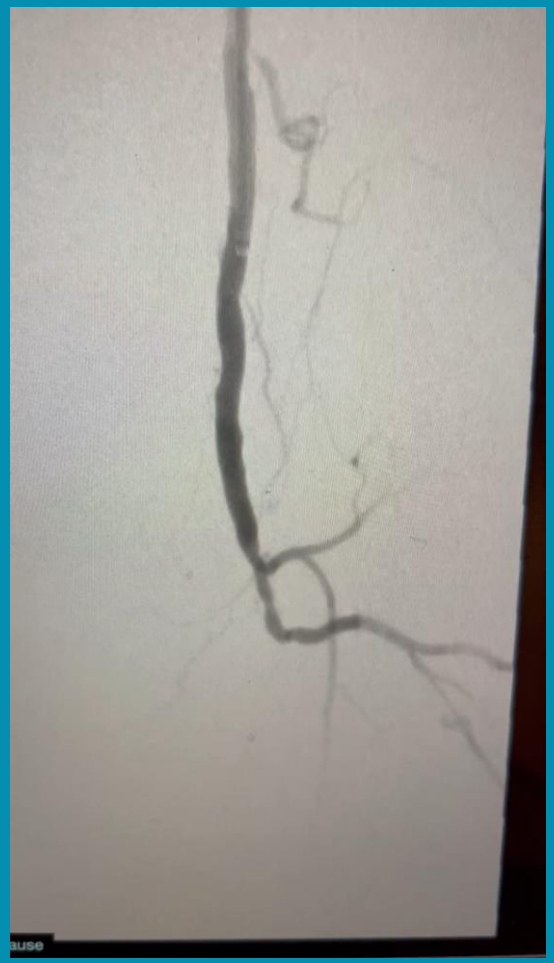
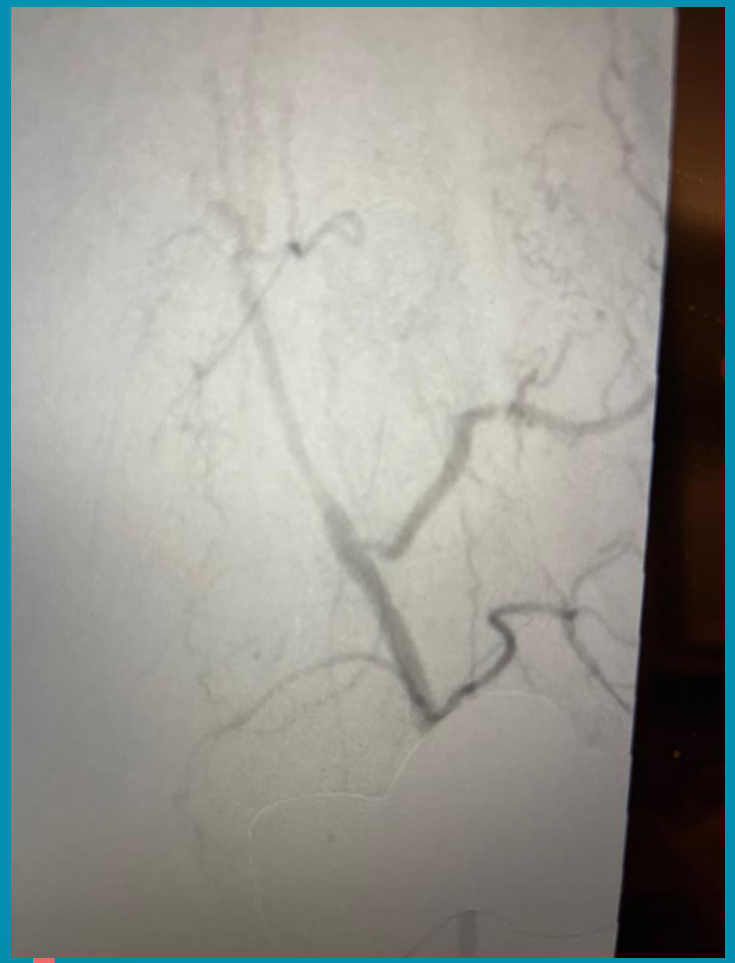
2023 at the Shore

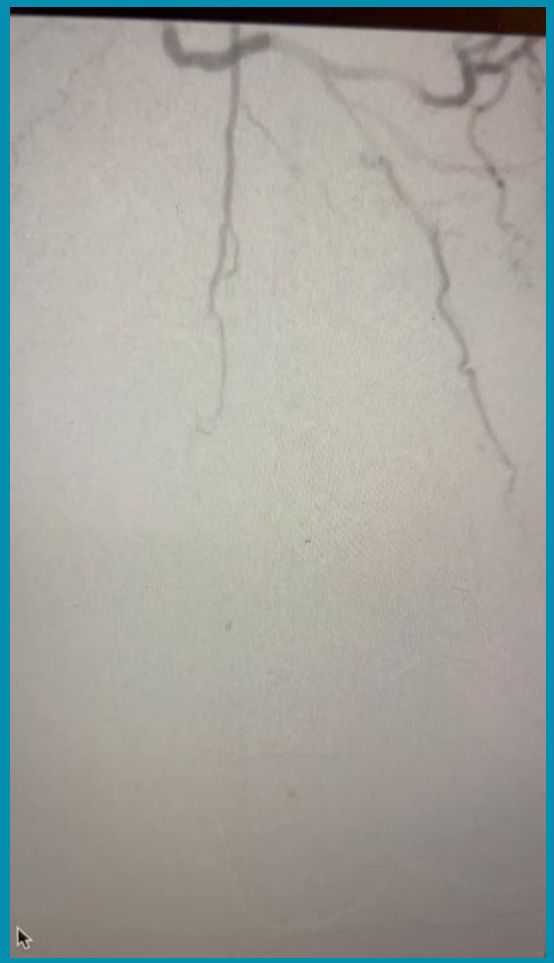


2023 at the Shore

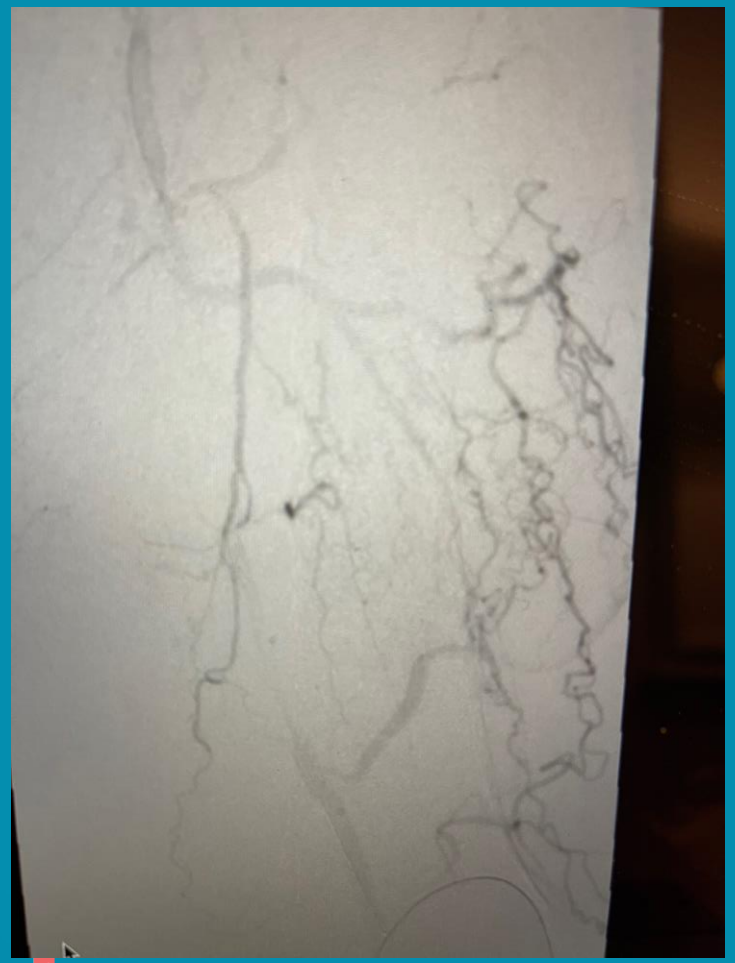






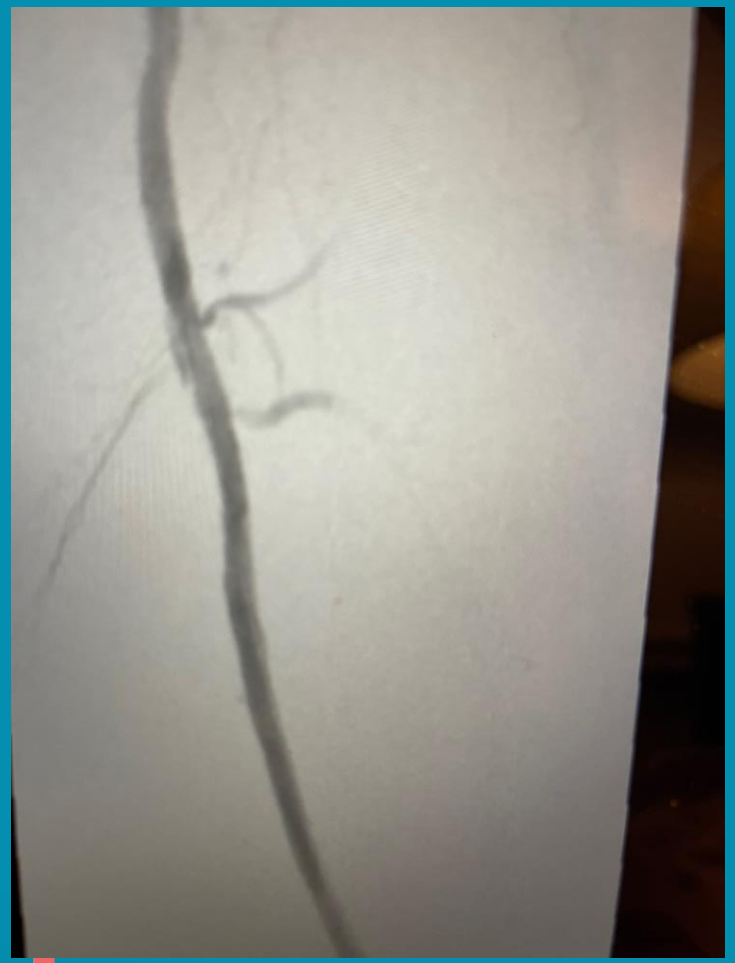


2022 at the Shore



2022 at the Shore

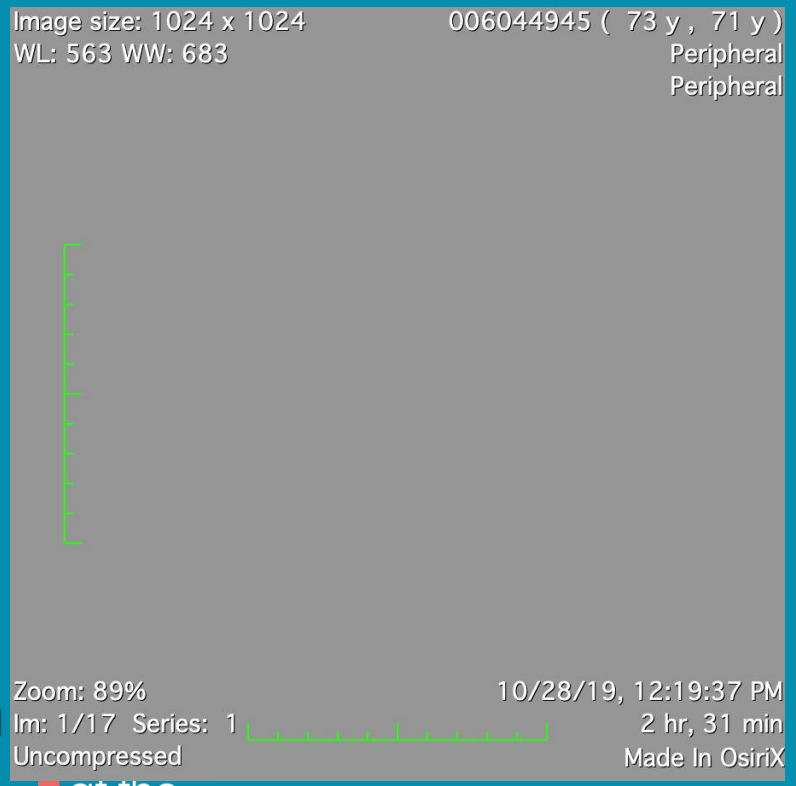
2022 at the Shore

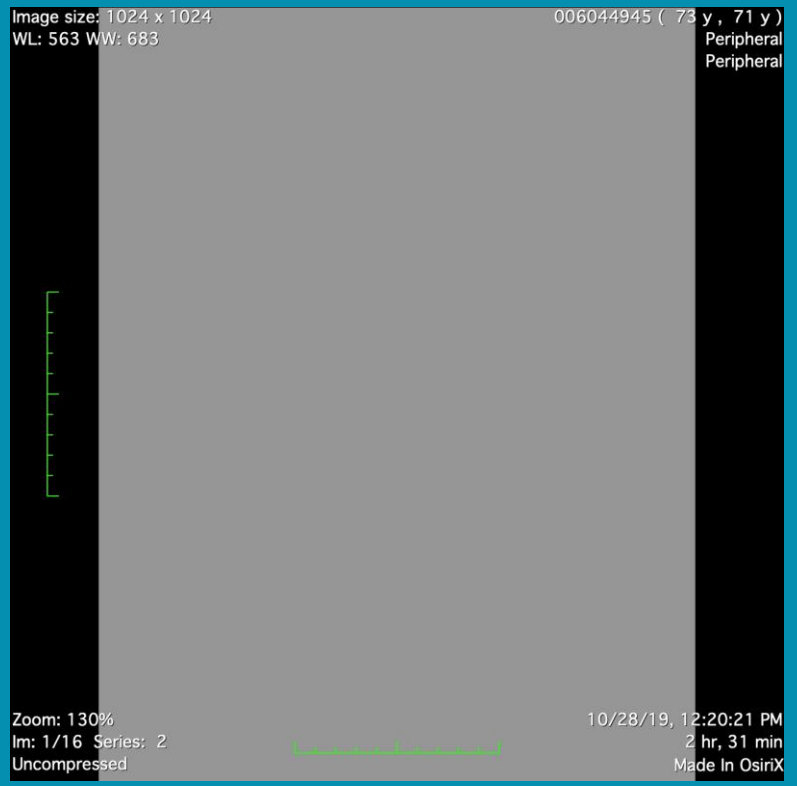


2022 at the Shore

Case 4

- 75 y/o female , DM, CAD, former smoker 70 pack history bilateral claudication, R > L





2020 at the Shore

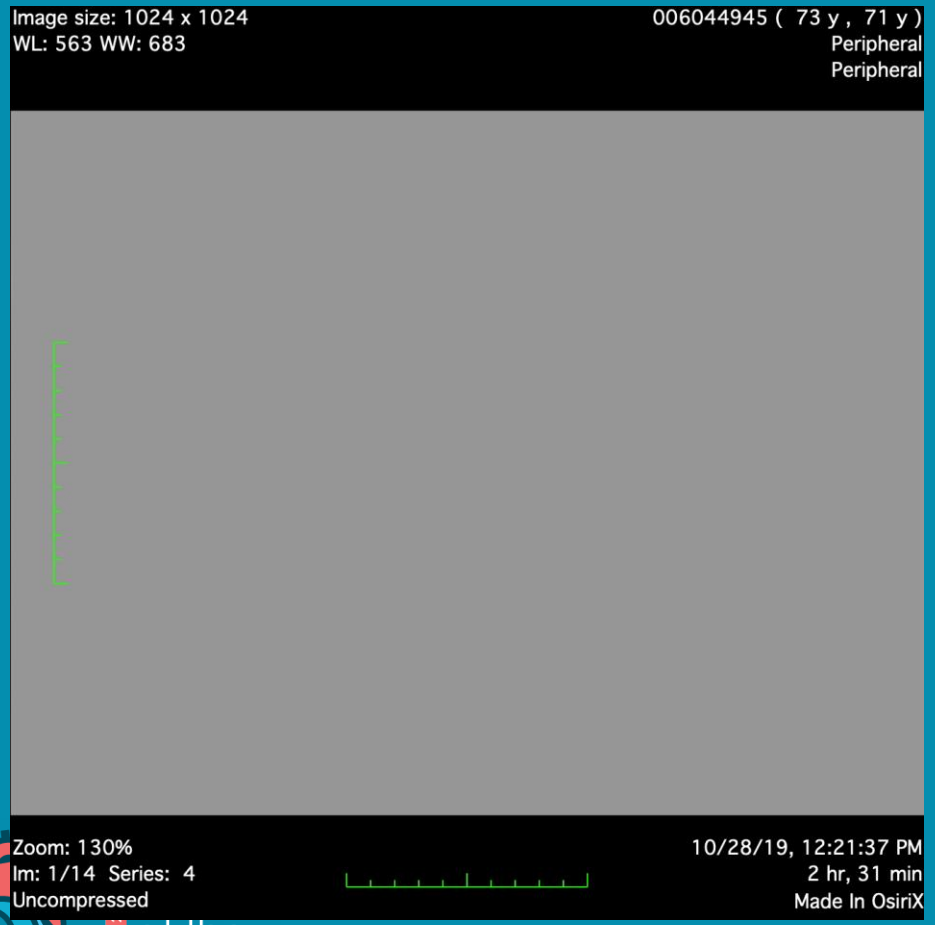
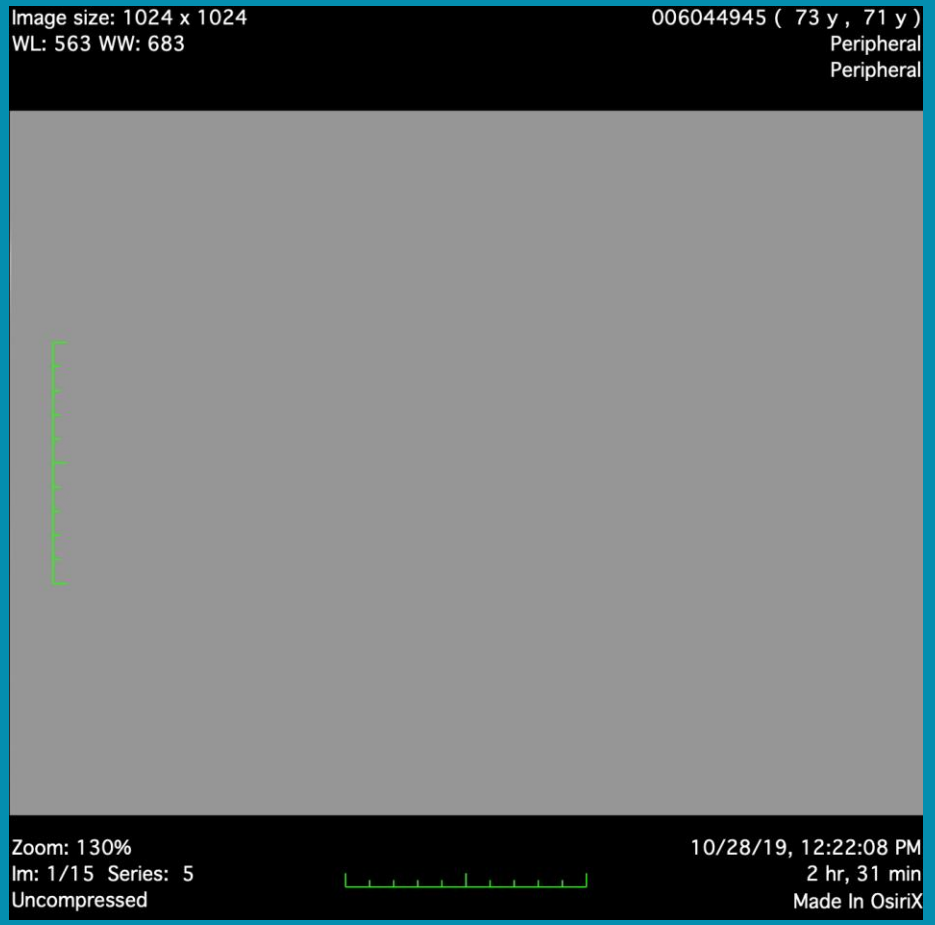


Image size: 1024 x 1024
WL: 563 WW: 683
006044945 (73 y , 71 y)
Peripheral
Peripheral
Zoom: 130%
Im: 1/14 Series: 4
Uncompressed
10/28/19, 12:21:37 PM
2 hr, 31 min
Made In OsiriX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006044945 (73 y , 71 y)
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Uncompressed
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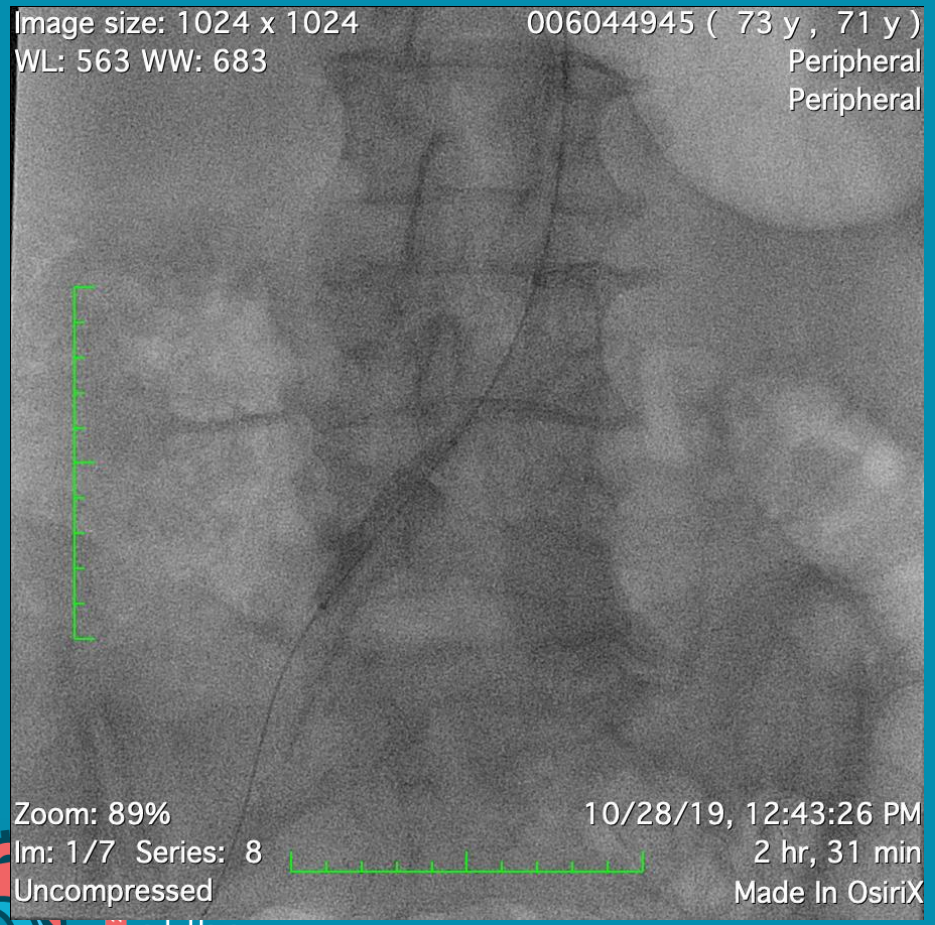
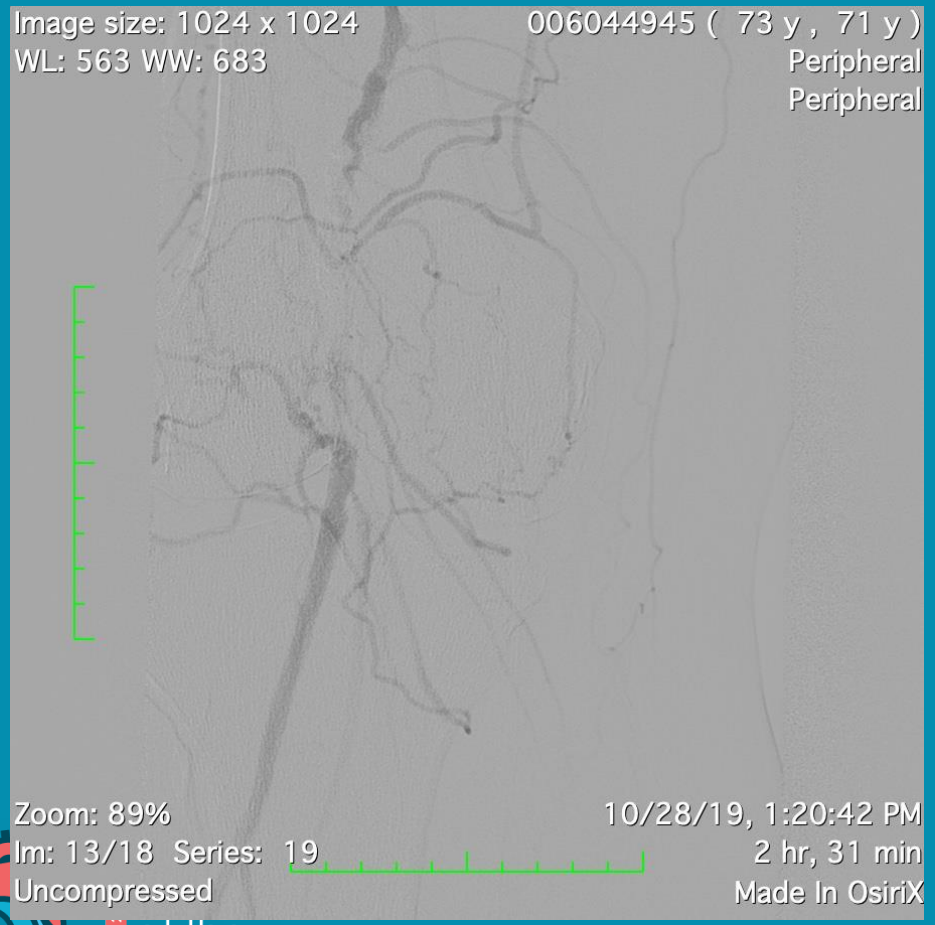
2 hr, 31 min
Made In OsiriX

at the Shore



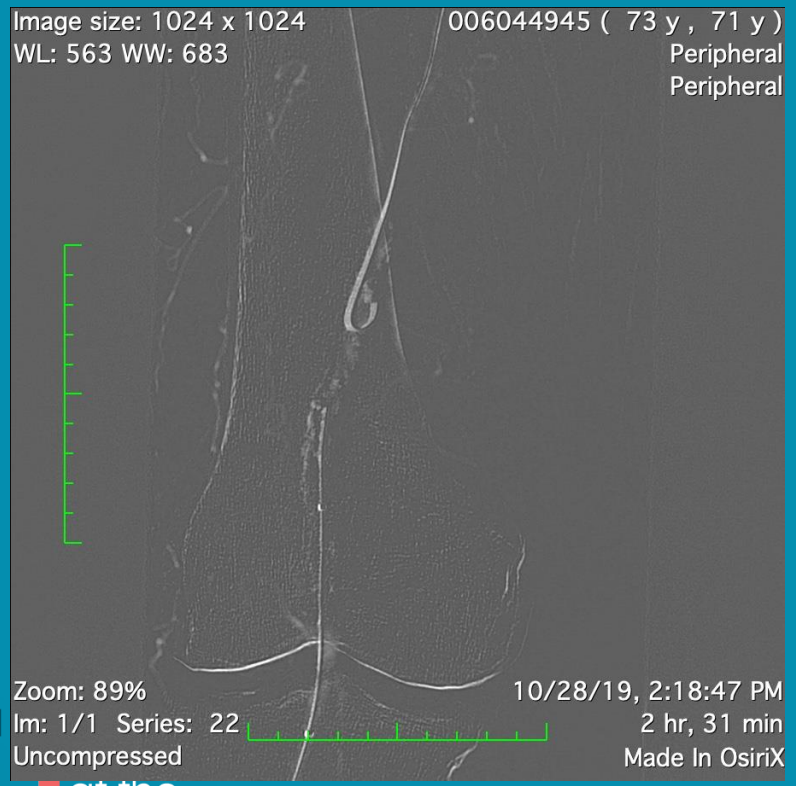
- PTA to iliac

at the Shore



- Unable to cross from above

at the Shore



- Successful pedal crossing

Post PTA

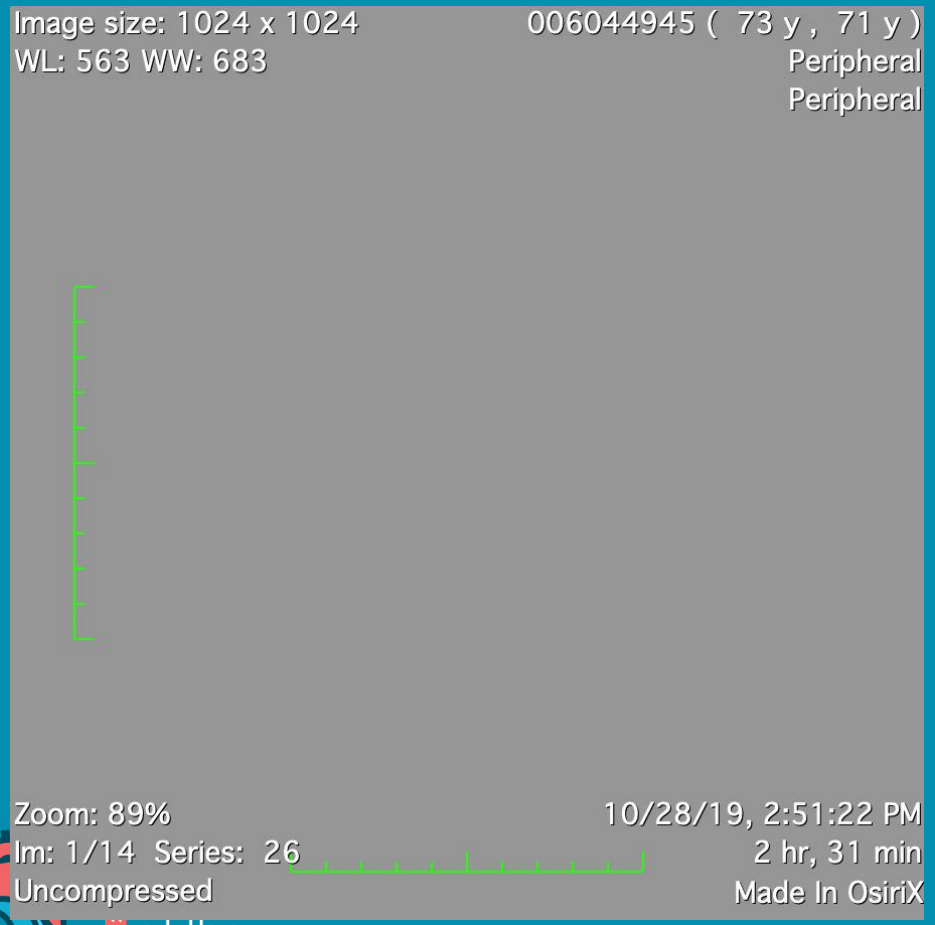


Image size: 1024 x 1024
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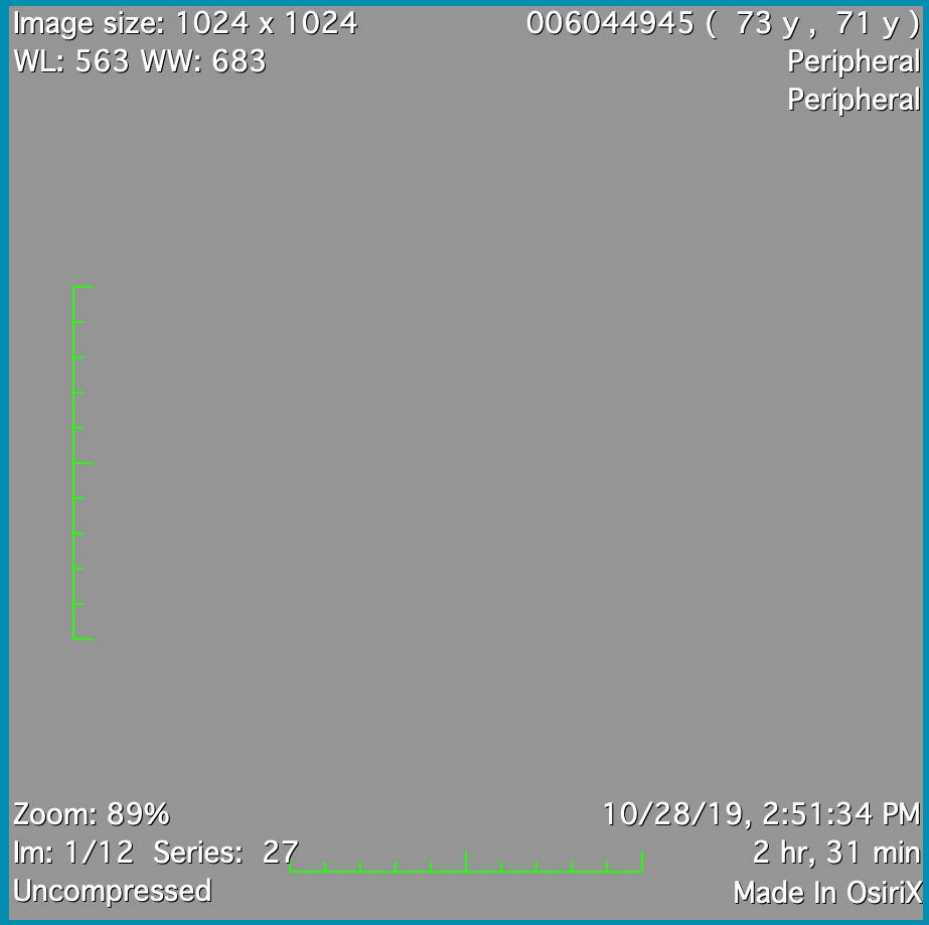
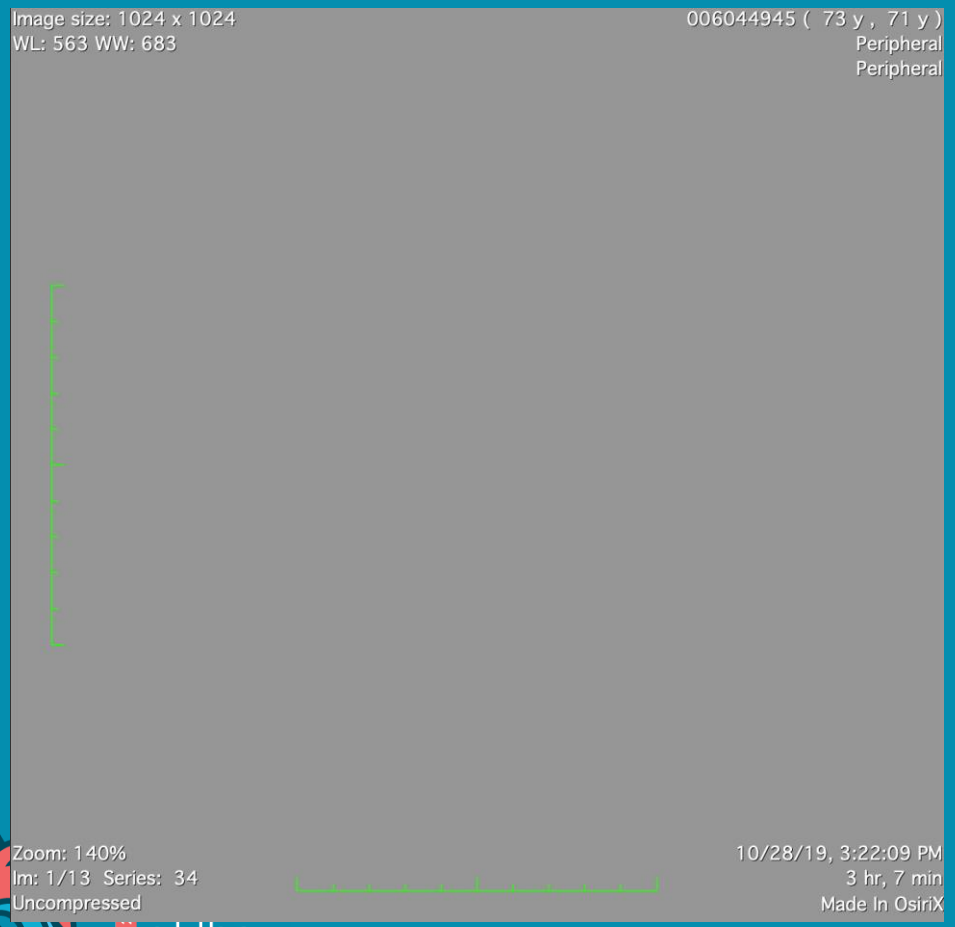
006044945 (73 y , 71 y)
Peripheral
Peripheral
Zoom: 89%
Im: 1/14 Series: 26
Uncompressed
10/28/19, 2:51:22 PM
2 hr, 31 min
Made In OsiriX

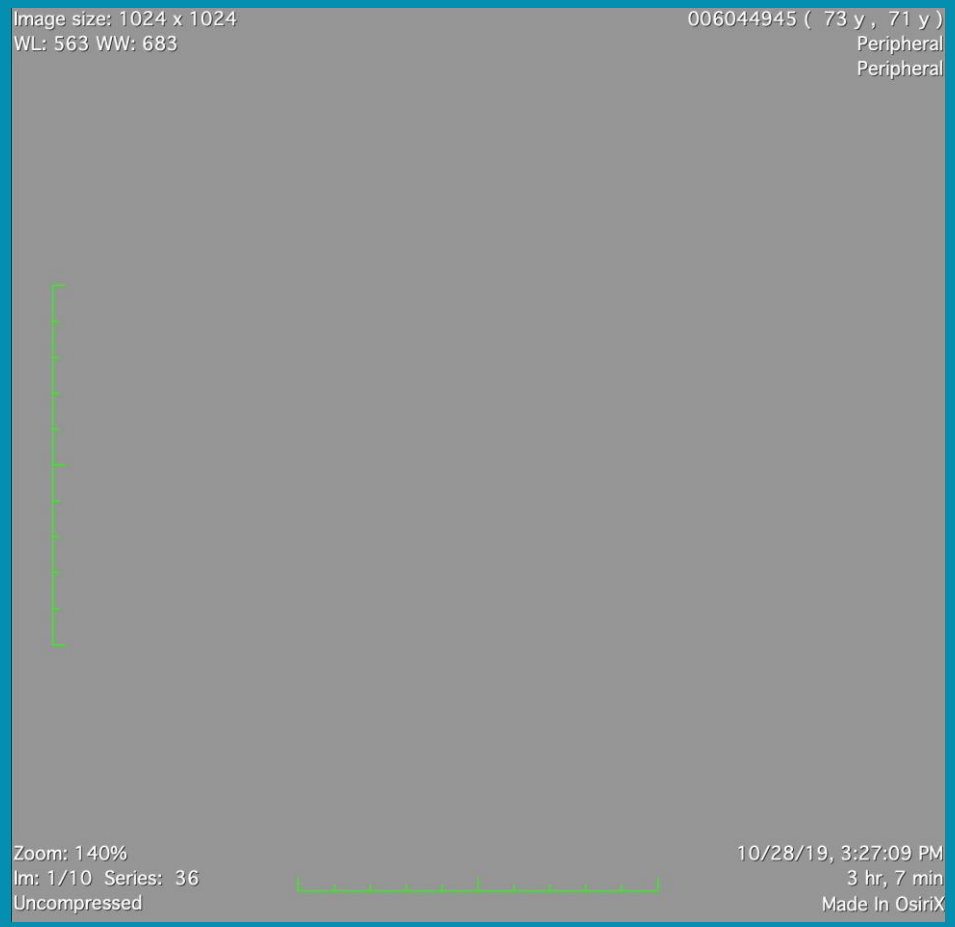

Image size: 1024 x 1024
WL: 563 WW: 683
006044945 (73 y , 71 y)
Peripheral
Peripheral
Zoom: 89%
Im: 1/14 Series: 26
Uncompressed
10/28/19, 2:51:22 PM
2 hr, 31 min
Made In OsiriX



Cors at the Shore 2023

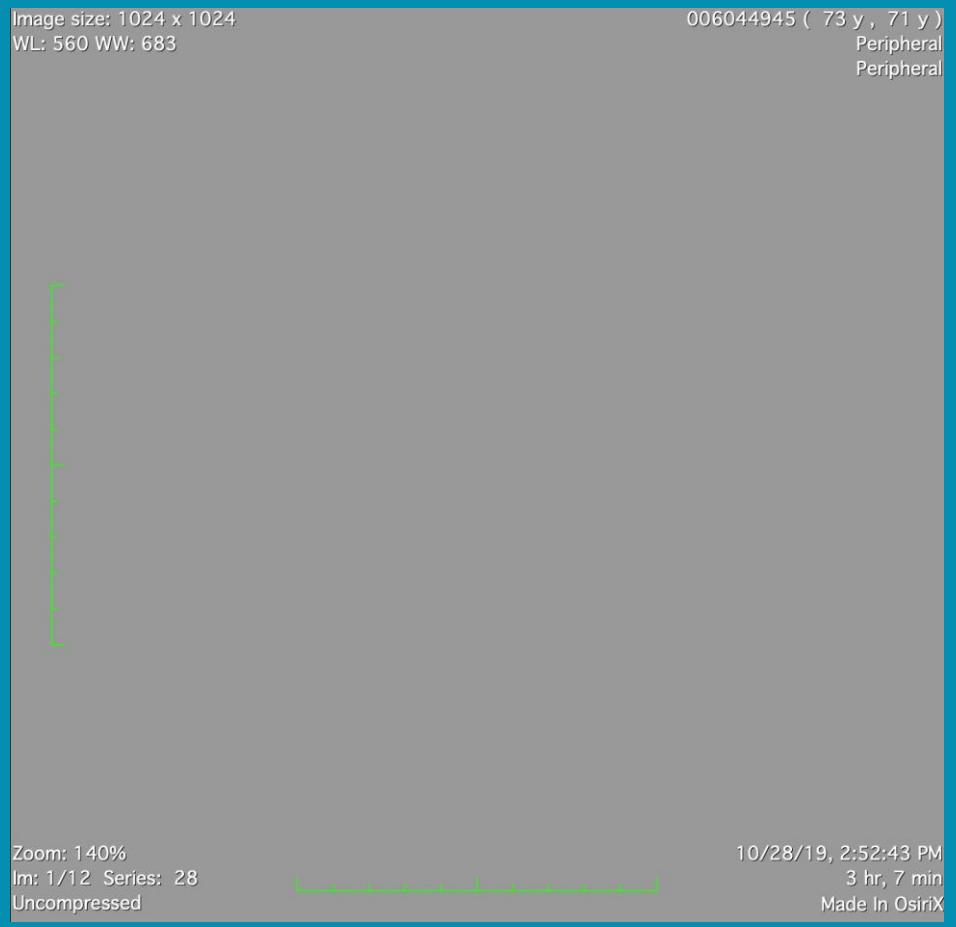
Final Angiograms





at the Shore

Final Angiograms



Cors at the Shore 2023


Zenition 70
De-Identified name
Vascular-Leg
Jun 20 2023
Series 6 (14:00)
Image 1-


Zenition 70
De-Identified name
Vascular-Leg
Jun 20 2023
Series 11 (14:24)
Image 1

at the Shore


Zenition 70
De-Identified name
Vascular-Leg
Jun 20 2023
Series 21 (14:35)
Image 1-


Zenition 70
De-Identified name
Vascular-Leg
Jun 20 2023
Series 22 (14:36)
Image 1-

at the Shore


Zenition 70
De-Identified name
Vascular-Leg
Jun 20 2023
Series 2 (13:52)
Image 1-


Zenition 70
De-Identified name
Vascular-Leg
Jun 20 2023
Series 24 (14:37)
Image 1-

at the
Shore