



Trépied endo: quelle place et quels résultats en 2025?

Bahaa NASR

CHU Cavale Blanche, Brest

Disclosures

Bahaa NASR MD PhD

I have the following potential conflicts of interest to report:

Personal fees and grants (medical advisory board, educational course, speaking) from: BD, Boston Scientific, iVascular, Medtronic, Terumo Aortic, WL Gore.



SRES 2020

SESSION 4 : INNOVATION

Le radiologue augmenté et avancé. **Julien Garnon (Strasbourg)**

Le chirurgien augmenté. **Fabien Thaveau (Strasbourg)**

Recommandations NICE : dernières informations. **Michel S. Makaroun (Pittsburg, USA)**

Modélisation aortique : applications cliniques. **Jean-Noël Albertini (Saint Etienne)**

Traitement des sténoses de l'artère du greffon hépatique.

Pierre-Antoine Barral (Marseille)

Les nouveaux stents périphériques (matériel, indication, résultats : an update).

Michael D. Dake (Arizona, USA)

Quelle plateforme, quel abord pour le traitement endovasculaire des lésions du trépied fémoral. **Bahaa Nasr (Brest)**

Discussion





2020 ----> 2025

Bravo Marine





2020 ----> 2025



Review > J Cardiovasc Surg (Torino). 2024 Aug;65(4):330-338.
doi: 10.23736/S0021-9509.24.13129-1. Epub 2024 Jul 12.

The specificities of the common femoral artery anatomy, calcification and endovascular treatment

Bahaa Nasr¹, Maxime Raux², Maxime Dubosq-Lebaz³, Camil-Cassien Bamde⁴,
Raphaël Coscas⁵, Yann Gouëffic⁶

Outcomes of Using Balloon-Expandable Covered Stent for Percutaneous Treatment of Access-Site Vascular Injury after Transfemoral Aortic Valve Implantation: A Single Center Experience

Clément Benic¹, Konstantinos Stavroulakis², Mélanie Carret³, Kevin Pluchon⁴,
Romain Didier¹, Bahaa Nasr⁵

Epub 2023 Jan 11.

Common femoral artery endarterectomy by eversion versus prosthetic patch angioplasty: a propensity-matched study

Bahaa Nasr^{1 2}, Mélanie Carret³, Kevin Pluchon⁴, Eric Bezon⁴

The Common Femoral Artery Is a Fixed Arterial Segment

Youssef Tijani¹, Mathilde Burgaud², Antoine Hamel³, Maxime Raux⁴, Bahaa Nasr⁵,
Yann Gouëffic⁶

Commentary to Eligibility of Common Femoral Artery Atherosclerotic Disease For Endovascular Treatment: The CONFESS Study

Yann Gouëffic¹, Bahaa Nasr²

Comment > J Vasc Surg. 2021 Aug;74(2):681. doi: 10.1016/j.jvs.2021.01.071.

Regarding "Systematic review and meta-analysis of endovascular versus open repair for common femoral artery atherosclerosis treatment"

Yann Gouëffic¹, Gilles Chatellier², Maxime Raux¹, Bahaa Nasr³

Stent Size Optimization in the Femoral Bifurcation Using a Fractal Model: A Morphological Analysis

Bahaa Nasr¹, Romain Didier², Mélanie Carret³, Martine Gilard², Pierre Gouny³,
Yann Gouëffic⁴

The Common Femoral Artery Bifurcation Lesions: Clinical Outcome of Simple Versus Complex Stenting Techniques – An Analysis Based on the TECCO Trial

Bahaa Nasr¹, Nellie Della Schiava², Fabien Thaveau³, Eugenio Rosset⁴, Jean-Pierre Favre⁵,
Lucie Salomon du Mont⁶, Jean-Marc Alsac⁷, Réda Hassen-Khodja⁸, Thierry Reix⁹,
Eric Allaire¹⁰, Eric Ducasse¹¹, Raphael Soler¹², Béatrice Guyomarc'h¹³, Yann Gouëffic¹⁴

Atherectomy-assisted endovascular therapy versus open repair for atherosclerotic common femoral artery disease: The multicenter ARISTON study

Grigorios Korosoglou¹, Jason T Lee², Martin Andrassy³, Drosos Kotelis⁴, Marco V Usai⁵,
Mario D'Oria⁶, Raphael Coscas^{7 8}, Nicola Troisi⁹, Bahaa Nasr¹⁰, Athanasios Saratzis¹¹,
Solon Antoniadis¹², Konstantinos P Donas^{13 14}

Atherectomy Followed by Drug-Coated Balloon Angioplasty Versus Surgery for Symptomatic Deep Femoral Artery Arteriosclerotic Disease

Giovanni Battista Torsello¹, Ryan Gouveia E Melo^{2 3}, Thomas Zeller⁴, Tanja Böhme⁴,
Grigorios Korosoglou⁵, Raphael Coscas⁶, Konstantinos Stavroulakis⁷, Dimitrios Kapetanios⁷,
Giovanni Federico Torsello⁸, Bahaa Nasr⁹

A Novel Technique for the Common Femoral Artery and its Bifurcation

Maxime Dubosq-Lebaz¹, Bahaa Nasr², Yann Gouëffic³



2020 ----> 2025

Recommendation 61

For patients with disabling intermittent claudication undergoing revascularisation, with common femoral artery stenosis or occlusion not extending down to the femoral bifurcation, endovascular treatment may be considered as an alternative to open surgery due to similar midterm patency rates compared with open surgery in non-complex common femoral artery lesions.

Class	Level	References	ToE
Ib	B	Changal <i>et al.</i> (2019) ⁵⁴³ Boufi <i>et al.</i> (2021) ⁵⁴⁴	

Recommendation 62

For patients with disabling intermittent claudication and a hostile groin (e.g., prior ipsilateral common femoral endarterectomy, morbid obesity, or previous regional radiotherapy to the groin region) undergoing revascularisation, endovascular treatment of steno-occlusive disease of the femoral bifurcation may be considered over open surgery due to the lower risk of surgical wound complications.

Class	Level	Reference
Ib	C	Consensus

ESVS guidelines

ESVS guidelines

Systematic review and meta-analysis of endovascular versus open repair for common femoral artery atherosclerosis treatment

Mourad Boufi, MD, PhD,^{1,2} Meghan Ejargue, MD,³ Magaye Gaye, MD,³ Laurent Boyer, MD, PhD,² Yves Allimi, MD, PhD,^{4,5} and Anderson D. Loundou, PhD,⁶ Marseille, France

ABSTRACT

Background: Encouraging recent reports on endovascular treatment of common femoral artery (CFA) atherosclerotic disease has rendered the question regarding the place of this technique evermore pertinent and legitimizes the performance of randomized trials. The present comprehensive review focused on the early and midterm outcomes to help assess the benefit/risk balance of endovascular vs open repair for CFA treatment.

Methods: Embase and Medline searches were conducted according to the PRISMA (Preferred Reporting Items for Systematic review and Meta-Analyses) standards to identify studies from 2000 to 2018 reporting on endovascular repair (ER), open surgery (OS), and comparisons of both techniques for CFA atherosclerosis treatment. The outcomes measured were 30-day mortality, morbidity, reintervention rates, midterm patency, late reintervention, and restenosis rates.

Results: Twenty-eight studies were eligible: 14 OS (1920 patients), 12 ER (1900 patients), and 2 comparative randomized trials (197 patients). The meta-analysis of the comparative studies revealed no differences in 30-day mortality or reintervention rates but improved 30-day morbidity after ER. At 1 year, the primary patency rates did not differ between ER and OS, nor did the late reintervention rate. In the noncomparative studies, with a mean follow-up period of 23.8 months for ER and 66 months for OS, the restenosis rate was 14.4% and 4.7%, respectively. The reported stent fracture rate was 3.6%. In the ER cohort, the overall primary patency at 1, 2, and 3 years was 81.9%, 77.8%, and 75.1%, respectively. For the OS cohort, the overall primary patency rate at 1, 2, and 3 years was 93.4%, 91.4%, and 90.5%, respectively.

Conclusions: Despite expectations, our analysis of the reported data suggests that the perioperative mortality is not in favor of ER; however, the perioperative morbidity showed an advantage for ER compared with OS. Also, although comparable in the first year, the long-term primary patency rate was much greater after OS. At present, the place of ER for CFA treatment still requires further definition. Additional clarification of the indications and more research are both required to determine the optimal endovascular technology and femoral bifurcation reconstruction with stenting. (J Vasc Surg 2021;73:1445-55).

Research Article

Systematic Review and Proportional Meta-Analysis of Endarterectomy and Endovascular Therapy with Routine or Selective Stenting for Common Femoral Artery Atherosclerotic Disease

Khalid Hamid Chungal¹, Mubbasher Ameer Syed,² Tawseef Dar,³ Muhammad Asif Mangi,³ and Mujeeb Abdul Sheikh⁴

¹Internal Medicine, Mercy Health St. Vincent Medical Center, Toledo, OH, USA

²Cardiovascular Medicine, University of Toledo College of Medicine and Life Sciences, Toledo, OH, USA

³Cardiology Division, Massachusetts General Hospital, Harvard Medical School, Boston, Massachusetts, USA

⁴Cardiovascular Medicine and Interventional Cardiology, University of Toledo College of Medicine and Life Sciences, 3065 Arlington Ave, Toledo, OH 43604, USA

Correspondence should be addressed to Mujeeb Abdul Sheikh, Mujeeb.Sheikh@utoledo.edu

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Introduction: Common femoral endarterectomy (CFE) has been the therapy of choice for common femoral artery atherosclerotic disease (CFA-ASD). In the past, there was inhibition to treat CFA-ASD endovascularly with stents due to fear of stent fracture and compromise of future vascular access site. However, recent advances and new evidence suggest that CFA may no longer be a "vent-forbidden zone". In the light of new evidence, we conducted a meta-analysis to determine the use of endovascular treatment for CFA-ASD and compare it with common femoral endarterectomy in the present era. **Methods:** Using certain MeSH terms we searched multiple databases for studies done on endovascular and surgical treatment of CFA-ASD in the last two decades. Inclusion criteria were randomized control trials, observational, prospective, or retrospective studies or during an endovascular treatment or CFE for CFA-ASD. For comparison, studies were grouped based on the treatment strategy used for CFA-ASD: endovascular treatment with selective stenting (EVT-SS), endovascular treatment with routine stenting (EVT-RS), or common femoral endarterectomy (CFE). Primary patency (PP), target lesion revascularization (TLR), and complications were the outcome studied. We did proportional meta-analysis using a random-effect model due to heterogeneity among the included studies. If confidence intervals of two results do not overlap, then statistical significance is determined. **Results:** Twenty-eight studies met inclusion criteria (7 for EVT-RS, 8 for EVT-SS, and 13 for CFE). Total limbs involved were 2914 (306 in EVT-RS, 678 in EVT-SS, and 1930 in CFE). The pooled PP at 1 year was 84% (95% CI 75-92%) for EVT-RS, 78% (95% CI 69-85%) for EVT-SS, and 93% (95% CI 90-96%) for CFE. PP at maximum follow-up in EVT-RS was 83.7% (95% CI 74-91%) and in CFE group was 88.3% (95% CI 81-94%). The pooled target lesion revascularization (TLR) rate at one year was 8% (95% CI 4-13%) for EVT-RS, 8% (95% CI 14-23%) for EVT-SS, and 4.5% (95% CI 1-9%) for CFE. The pooled rate of total complications for EVT-RS was 5% (95% CI 2-10%), for EVT-SS was 7% (95% CI 3-12%), and CFE was 22% (95% CI 14-32%). Mortality at maximum follow-up in CFE group was 23.1% (95% CI 14-33%) and EVT-RS was 5.3% (95% CI 1-11%). **Conclusions:** EVT-RS has comparable one-year PP and TLR as CFE. CFE showed an advantage over EVT-SS for one-year PP. The complication rate is lower in EVT-RS and EVT-SS compared to CFE. At maximum follow-up, CFE and EVT-RS have similar PP but CFE has a higher mortality. These findings support EVT-RS as a management alternative for CFA-ASD.

Stenting or Surgery for De Novo Common Femoral Artery Stenosis

Yann Gouëffic, MD, PhD,^{1,2,3,4} Nellie Della Schiava, MD,⁴ Fabien Thavau, MD, PhD,⁴ Eugenio Rosset, MD, PhD,¹ Jean-Pierre Favre, MD, PhD,⁴ Lucie Salomon du Mont, MD,⁴ Jean-Marc Alsac, MD, PhD,¹ Réda Hassen-Khodja, MD,¹ Thierry Reix, MD,⁴ Eric Allaire, MD, PhD,¹ Eric Ducasse, MD, PhD,¹ Raphael Soler, MD,⁴ Béatrice Guyomarç'h,⁴ Bahaa Nasr, MD⁵

JACC: Cardiovascular Interventions CME/MOC

This article has been selected as this issue's CME/MOC activity, available online at <http://www.acc.org/jacc-journals-cme> by selecting the JACC Journals CME/MOC tab.

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CME/MOC Objective for This Article: At the end of the activity the reader should be able to: 1) appraise the rate of major adverse cardiovascular and local complications in patients undergoing surgical repair of the common femoral artery stenosis; 2) compare the rates of perioperative mortality and morbidity, morphological and hemodynamic outcomes in patients undergoing stenting or surgical repair for de novo common femoral artery stenosis; and 3) recognize the limitations of balloon angioplasty and bioresorbable scaffold deployment in attempting to obtain revascularization for common femoral artery stenosis.

CME/MOC Editor Disclosure: JACC: Cardiovascular Interventions CME/MOC Editor Bill Grogan, MD, PhD, has reported that he has no disclosures.

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CME/MOC Term of Approval

Issue Date: July 10, 2017
Expiration Date: July 9, 2018

Boufi et al. J Vasc Surg 2021

Chungal et al. J Interv Cardiol 2019

Gouëffic et al. JACC Cardiovasc 2017

Specificities of the CFA

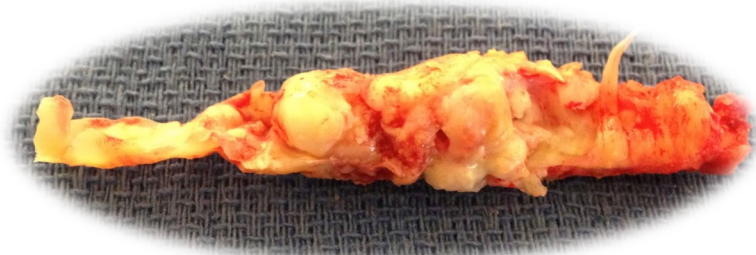


Calcium Concentration

Stent fracture

CFA bifurcation lesions

Redo Intervention



CFA Calcifications

CONFESS Study

Peripheral Arteries

Eur J Vasc Endovasc Surg (2022) 64, 684–691

Editor's Choice – Eligibility of Common Femoral Artery Atherosclerotic Disease for Endovascular Treatment – the CONFESS Study

Sabriela Kaneta^{a,*}, Sheheeen Husain^a, Liam Musto^a, Tatiana Hamakarim^a, Ahmed Elsharkawi^a, Sofia Littlejohn^a, Jessica Helm^a, Athanasios Saratzis^a, Hany Zayed^a

^aGuy's and St Thomas' NHS Foundation Trust, London, UK

^bDepartment of Cardiovascular Sciences, University of Leicester, Leicester, UK

^cKing's College, London, UK

WHAT THIS PAPER ADDS

With the constant development of endovascular techniques, the need to explore the use of this treatment modality in the common femoral artery (CFA) territory has become clear. In this study, a detailed anatomical and morphological examination of CFA atherosclerotic plaques was performed. The results of this in depth analysis showed that a large proportion of these patients could be considered for endovascular treatment based on their anatomical features and the extent of disease. These results could form the basis of future large scale studies in this area.

Objective: Advances in endovascular technologies have allowed the treatment of common femoral artery (CFA) steno-occlusive disease by minimally invasive means; however, the proportion of lesions treated with common femoral artery endarterectomy (CFAE) which would be amenable to endovascular treatment is unknown. This observational study aimed to describe the morphology and composition of CFA lesions treated with CFAE and report the proportion that would be amenable to endovascular treatment with modern technologies.

Methods: Patients presenting with symptomatic peripheral artery disease who underwent CFAE from January 2014 to December 2018 in two tertiary NHS hospitals were included. Extensive data relating to patient demographics, risk factors, clinical outcomes, as well as anatomical and morphological characteristics of the CFA atherosclerotic lesions, were collected which included detailed plaque analysis using 3D reconstruction of pre-operative computed tomography angiograms. CFA lesions were considered suitable for endovascular treatment if presented with patent iliac inflow, at least one patent outflow vessel (superficial femoral artery [SFA] or profunda femoral artery [PFA]), and stenotic rather than occluded CFA.

Results: A total of 829 CFAs in 737 consecutive patients who underwent CFAE were included (mean age 71 ± 10 years; 526 males, 71%); 451 (62%) presented with chronic limb threatening ischaemia. Overall, 35% of CFAs had a localised lesion (no bifurcation disease) that could possibly be treated endovascularly. In total, 376 (45%) target vessels did not feature severe calcium load, with a patent CFA, PFA, and proximal SFA and therefore would have been amenable to endovascular treatment; while 271 CFAs (33%) featured a significant calcium load which would have potentially required stenting.

Conclusion: A significant proportion of patients with atherosclerotic CFA lesions who undergo surgery could potentially be candidates for endovascular treatment. A randomised trial comparing CFAE and new endovascular techniques in this clinical context is required.

Keywords: Common Femoral Artery, Endarterectomy, Endovascular, Peripheral Arterial Disease, Plaque analysis

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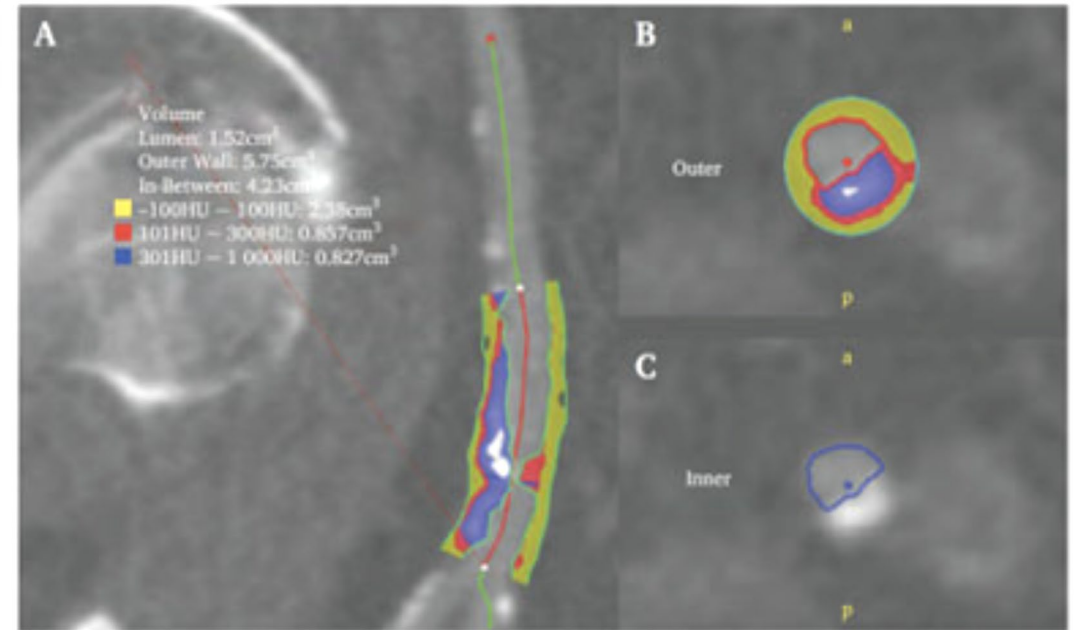


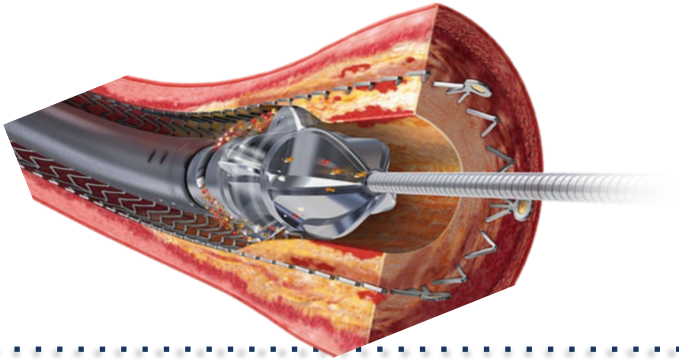
Figure 1. Computed tomography angiography analysis of atherosclerotic plaque of common femoral artery. (A) Multiplanar reformat with centreline and region of interest identified. (B) Outer wall line and plaque colour map with soft (yellow), fibrocalcific (red), and calcified (blue) components. (C) Transverse section with lumen identified. a = anterior; p = posterior.

67% did not have heavily calcified plaques

Review

Percutaneous Endovascular Reconstruction of the Common Femoral Artery and Its Bifurcation

Authors	Publication Year	Trial	CFA Lesions (n)	Preparation Tool	Devices Used	DCB	Filter	Technical Success	Complications n (%)	Bailout Stenting n (%)	Freedom from TLR
Picazo [62]	2020	retrospective	25	atherectomy	HO	92%	100%	92%	3 (12)	1 (4)	93.4%
Böhme [46]	2020	retrospective	250	atherectomy	TH, HO, SH	60.4%	75.6%	92.4%	26 (10.4)	20 (8)	86.4% *
Cioppa [47]	2021	retrospective, registry	80	atherectomy	TH, SH	100%	100%	100%	0	6 (7.5)	86.7%
Baig [49]	2022	retrospective, subgroup	35	atherectomy	SH, HO, DB	100%	83%	100%	2 (5.7)	2 (5.7)	91.2%
Baig [49]	2022	retrospective, subgroup	33	intravascular lithotripsy	Shockwave Medical	100%	0	100%	1 (3)	0	79.4%
Stavroulakis [61]	2023	retrospective	33	intravascular lithotripsy	Shockwave Medical	90%	NR	97%	4 (12)	4 (12)	94%



ARISTON Study

- 11 vascular European centers
- 826 patients, 213 ENDO and 613 OPEN

Original Research Article

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MEDICINE

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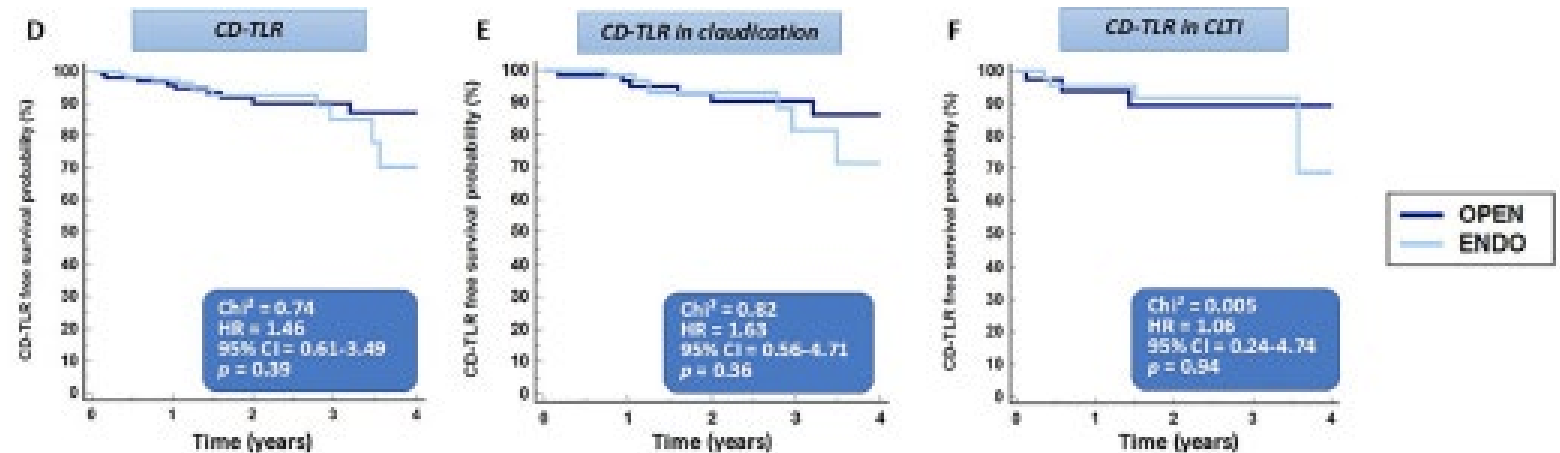


Atherectomy-assisted endovascular therapy versus open repair for atherosclerotic common femoral artery disease: The multicenter ARISTON study

Grigorios Korosoglou¹, Jason T Lee², Martin Andrassy³, Drosos Kotelis⁴, Marco V Usai⁵, Mario D'Oria⁶, Raphael Coscas^{7,8}, Nicola Troisi⁹, Bahaa Nasr¹⁰, Athanasios Saratzis¹¹, Solon Antoniadis¹², and Konstantinos P Donas^{13,14} on behalf of the ARISTON Collaborative

Abstract

Background: Endarterectomy (open repair) represents the gold-standard for common femoral atherosclerotic disease (CFAD) treatment. However, with developments like atherectomy, endovascular therapy (endovascular revascularization) may offer an alternative option. The aim of the present study was to evaluate the safety and effectiveness of endovascular versus open therapy for the CFAD. **Methods:** The ARISTON (Atherectomy-assisted endovascular Therapy versus Open) study was an 11-center research collaborative in which data from consecutive patients with symptomatic CFAD were analyzed. Retrospective matching was performed for patient-specific characteristics, including age, cardiovascular risk factors and comorbidities, and lesion-specific variables, including lesion calcification and complexity. Primary endpoints were all-cause mortality and freedom from clinically driven target lesion revascularization (CD-TLR). Amputation-free survival (AFS) was a secondary endpoint. **Results:** From 2015 to 2022, 826 patients undergoing endovascular (n = 213 [25.8%]) versus open therapy (n = 613 [74.2%]) were analyzed. The total number of procedural complications was higher with open therapy, whereas hospital stay was shorter with endovascular therapy (p < 0.0001 for both). Major adverse cardiac and limb events at 30-day outcomes were, however, not statistically different (p = 0.06). Bail-out stent rates with atherectomy-assisted endovascular therapy were 5.1%. After matching and during 1.72 (0.9–3.3) years of follow up, all-cause mortality, AFS, and CD-TLR were not statistically different in endovascular versus open therapy (HR = 0.68, 95% CI 0.36–1.29; HR = 1.5, 95% CI 0.59–3.77; and HR = 1.46, 95% CI 0.61–3.49, p = NS for all). **Conclusion:** Endovascular and open therapy exhibit comparable outcomes for the treatment of patients with symptomatic CFAD, including similar CD-TLR in patients with calcification and AFS in patients with chronic limb-threatening ischemia, during short-term follow up. Atherectomy-assisted endovascular therapy may therefore provide a useful alternative for patients who are unfit for surgery.



10% of stenting

Hip Joint Flexion

Comparative Study > Ann Vasc Surg. 2021 May;73:51-54. doi: 10.1016/j.avsg.2020.10.049.

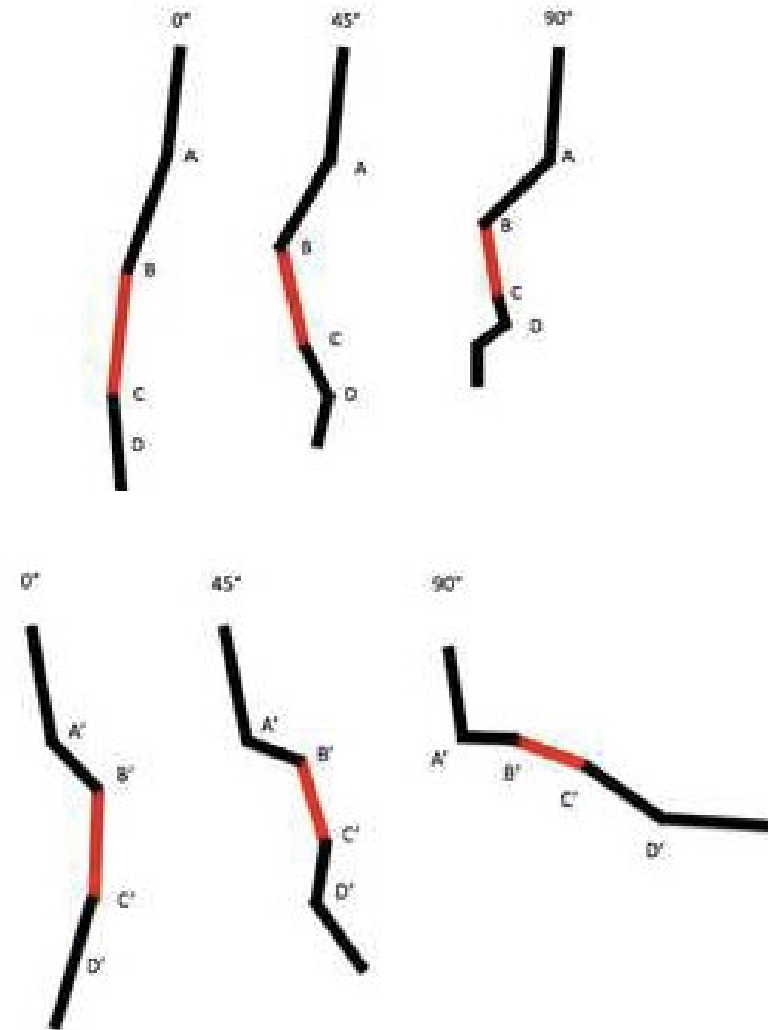
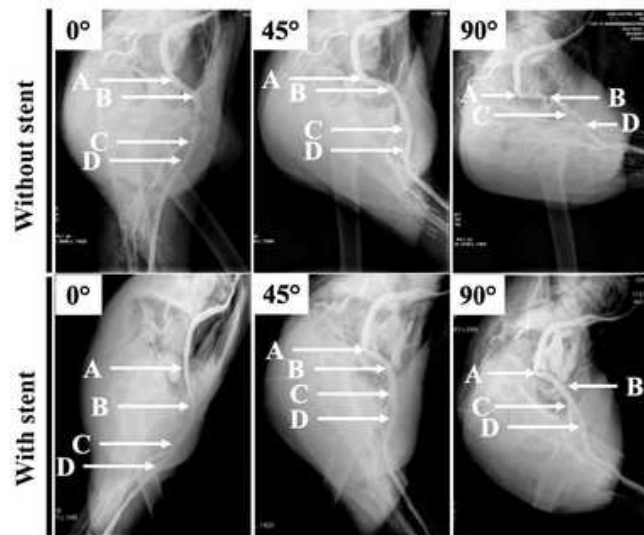
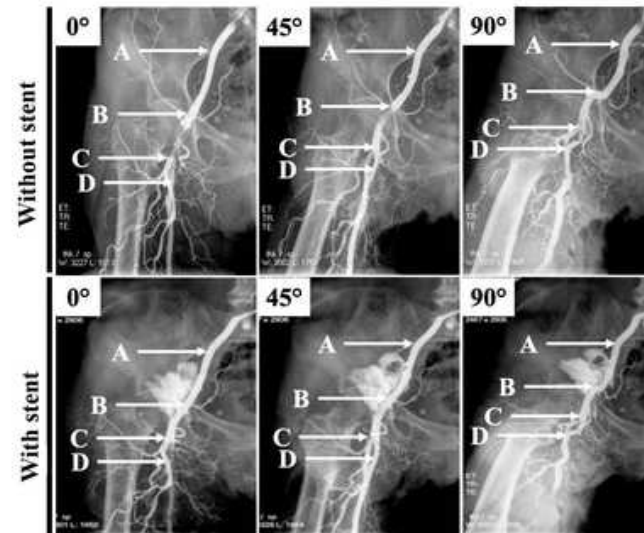
Epub 2021 Jan 5.

The Common Femoral Artery Is a Fixed Arterial Segment

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Affiliations + expand

PMID: 33359328 DOI: 10.1016/j.avsg.2020.10.049



Tijani Y et al. Ann Vasc Surg 2021

Best stent for the CFA ?

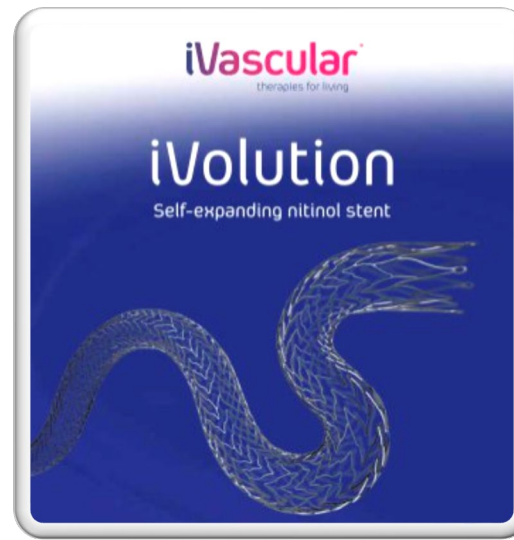
Resist to the risk of calcium-related crushing

Flexible enough to be positioned at the iliofemoral junction lesions

Maintain any subsequent access at this level

VMI-CFA trial

Prospective, multicenter, single arm trial to evaluate the Supera Peripheral Vascular Mimetic Implant Device (Abbott Vascular) for symptomatic (RB 2-4) CFA disease treatment



Deloose K, Linc,

CFA bifurcation lesions

Peripheral Arteries

Eur J Vasc Endovasc Surg (2022) 64, 684–691

Editor's Choice — Eligibility of Common Femoral Artery Atherosclerotic Disease for Endovascular Treatment — the CONFESS Study

Gabriela Kaneta¹, Sheheeen Husain², Liam Musto², Tatiana Hamakarim², Ahmed Elsharkawi², Sofia Littlejohn², Jessica Helm², Mhaniasos Saratzis², Hany Zayed²

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²Department of Cardiovascular Sciences, University of Leicester, Leicester, UK
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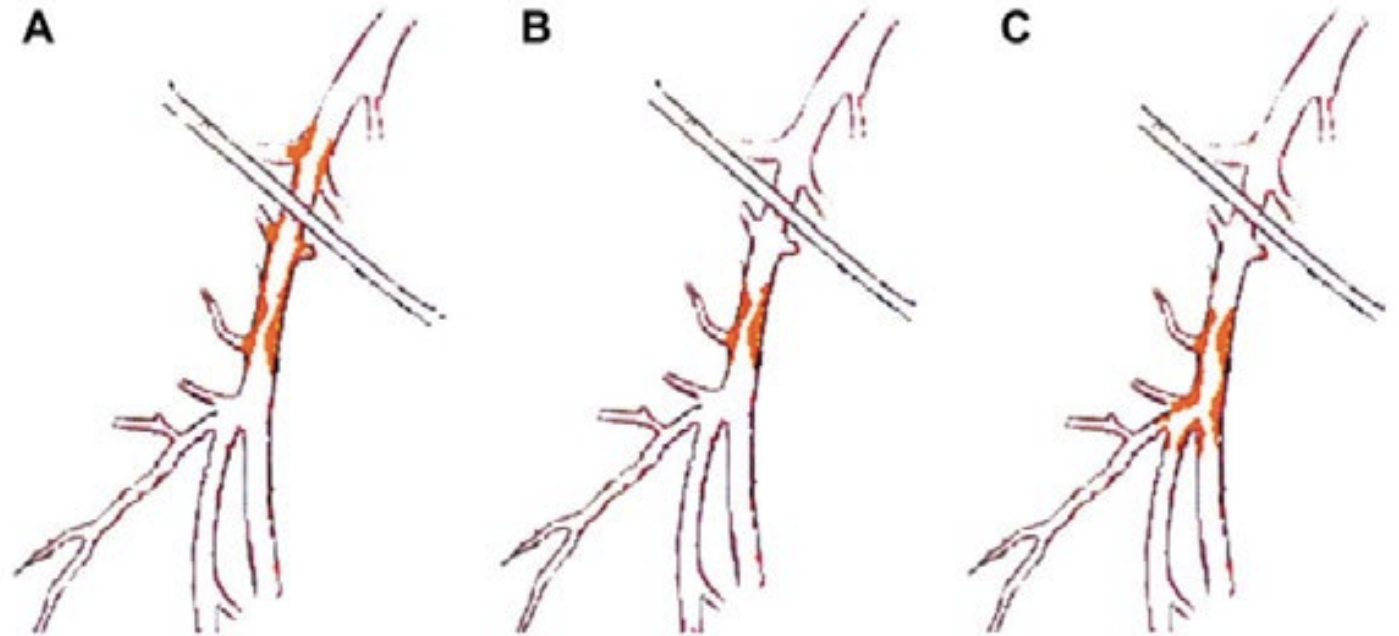
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10%

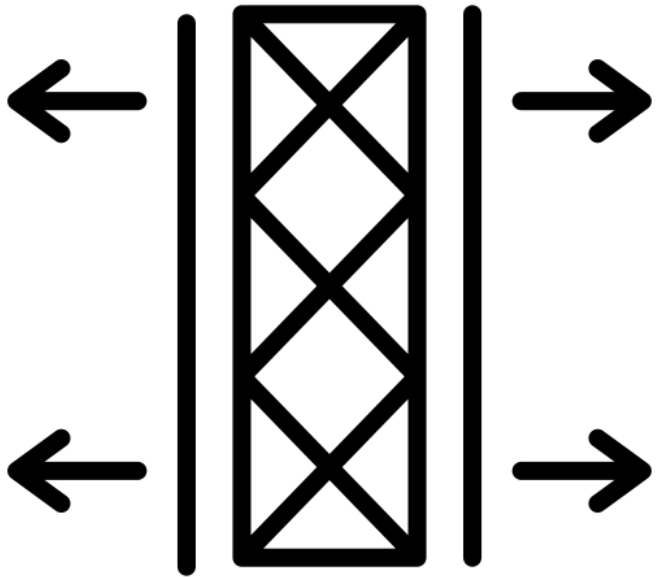
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65%

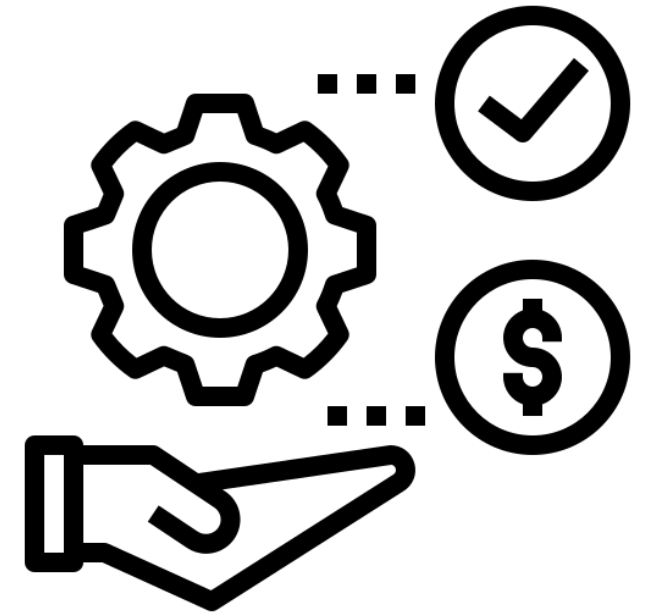
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Scaffolding for the CFA Bifurcation lesions

Optimally restore flow in the femoral bifurcation

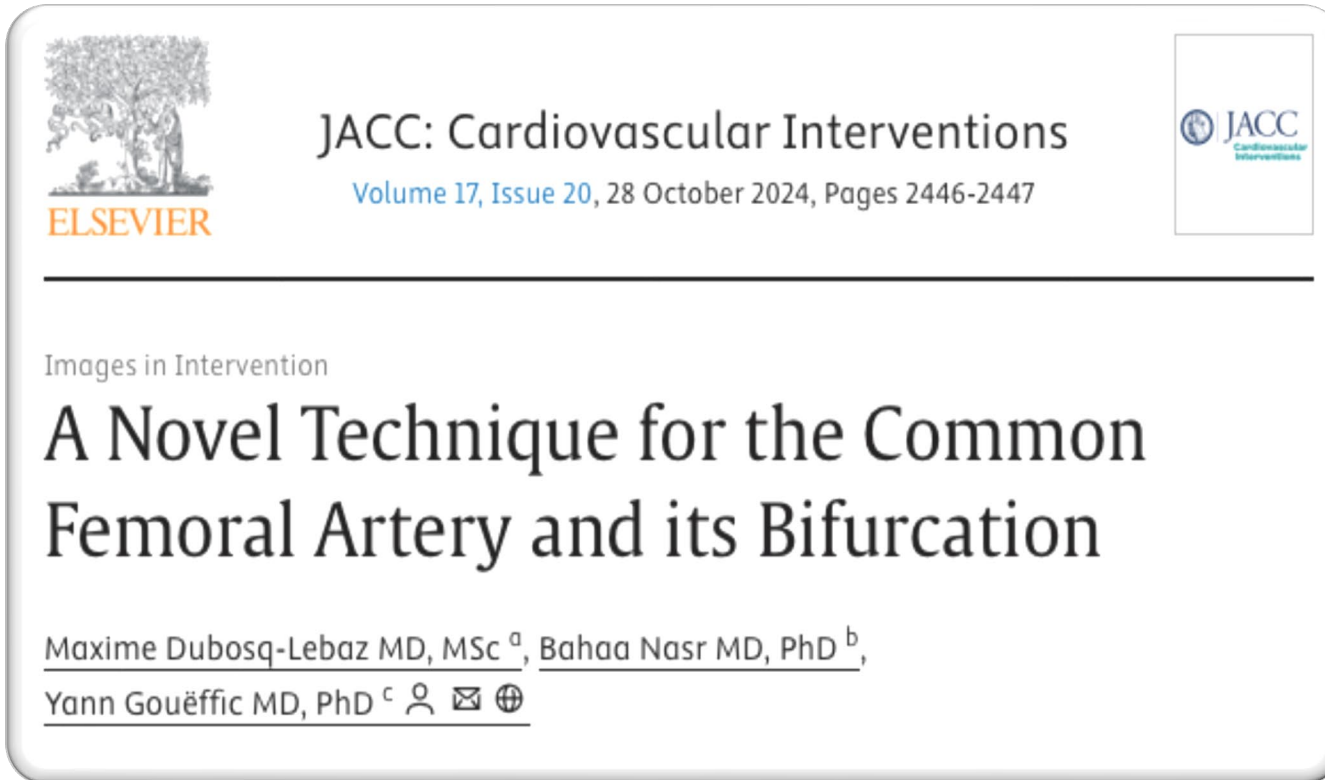


Respect the diameter decrease between the CFA diameter and the daughters vessels



Redo CFA puncture through the stent mesh

« Tour Eiffel » Technique



Tour Eiffel Technique 2 steps

1. Stenting of the CFA trunk by a OTW 0.035 SES
2. Stenting of the CFA bifurcation by 2 BE stents

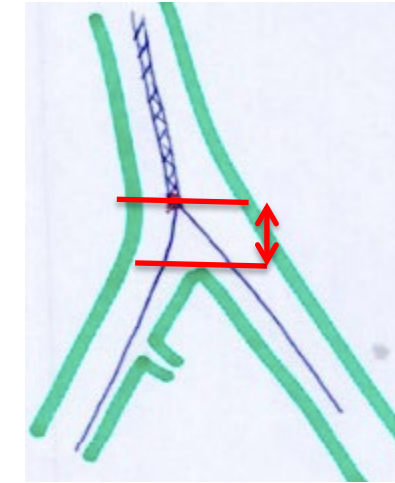
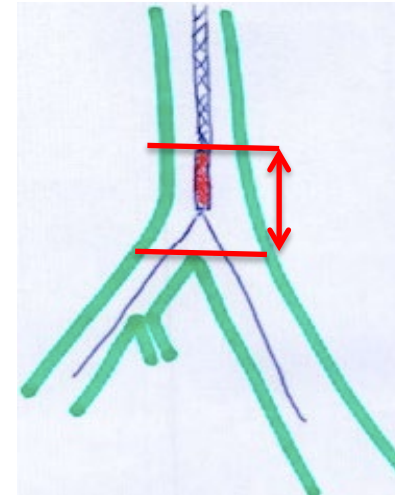
« Tour Eiffel » Technique



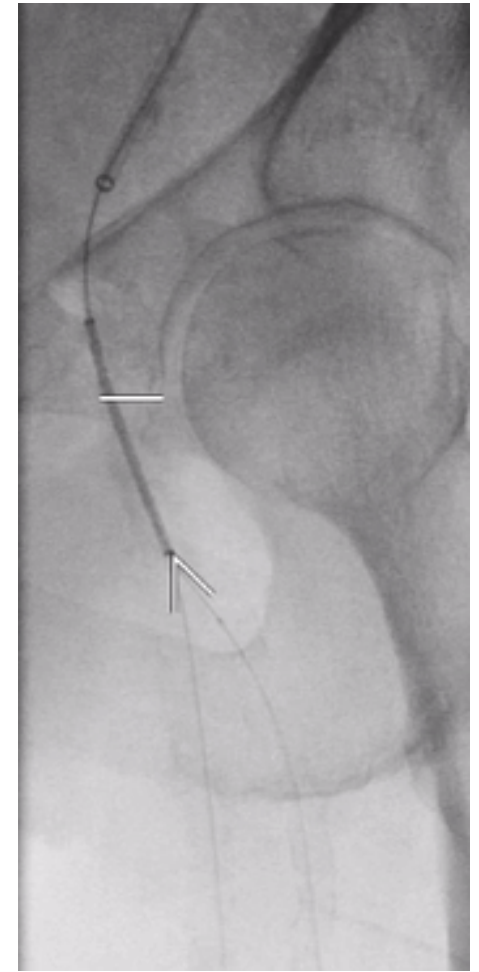
A co-axial .035 SES is chosen and its **delivery catheter tip is cut** as much as possible



The .035 delivery system is **threaded over the two .014** in place



The .035 SES is **implanted as close as possible of the CFA bifurcation** to allow the connection with the BES



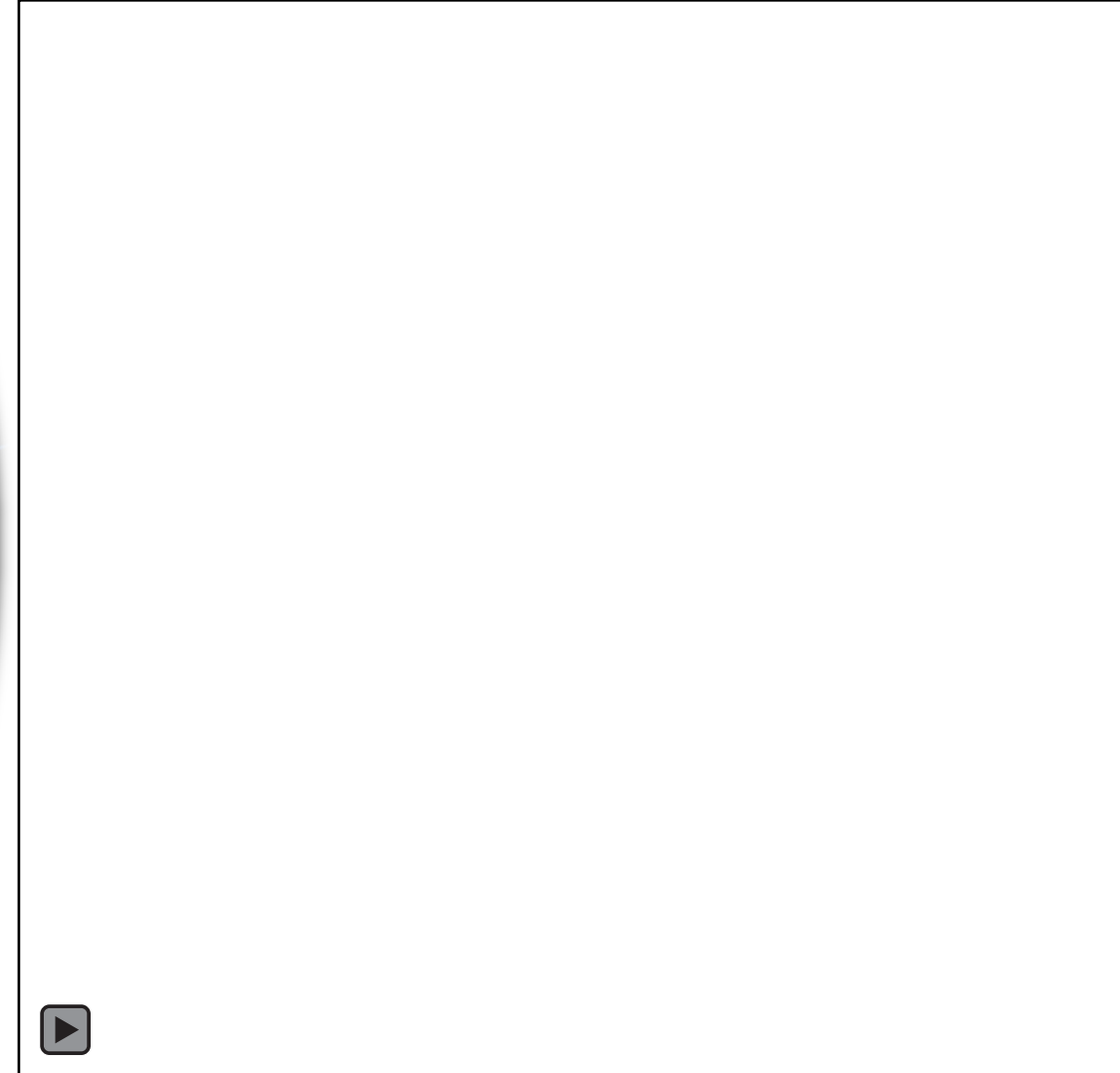
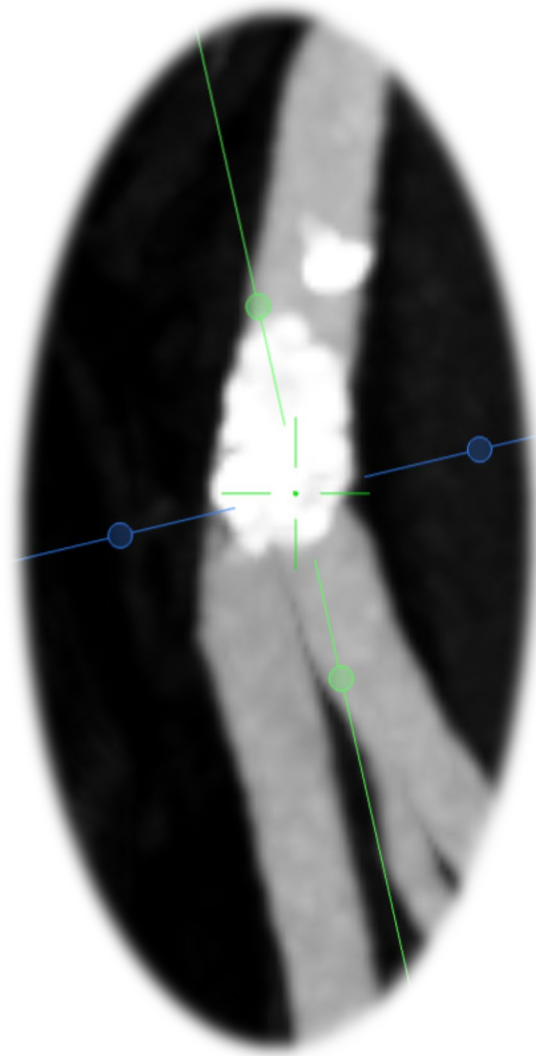
SAVE-CFA: Comparison of Stent-Avoiding with a stent-prEferred strategy in Common Femoral Artery endovascular treatment after IVL preparation



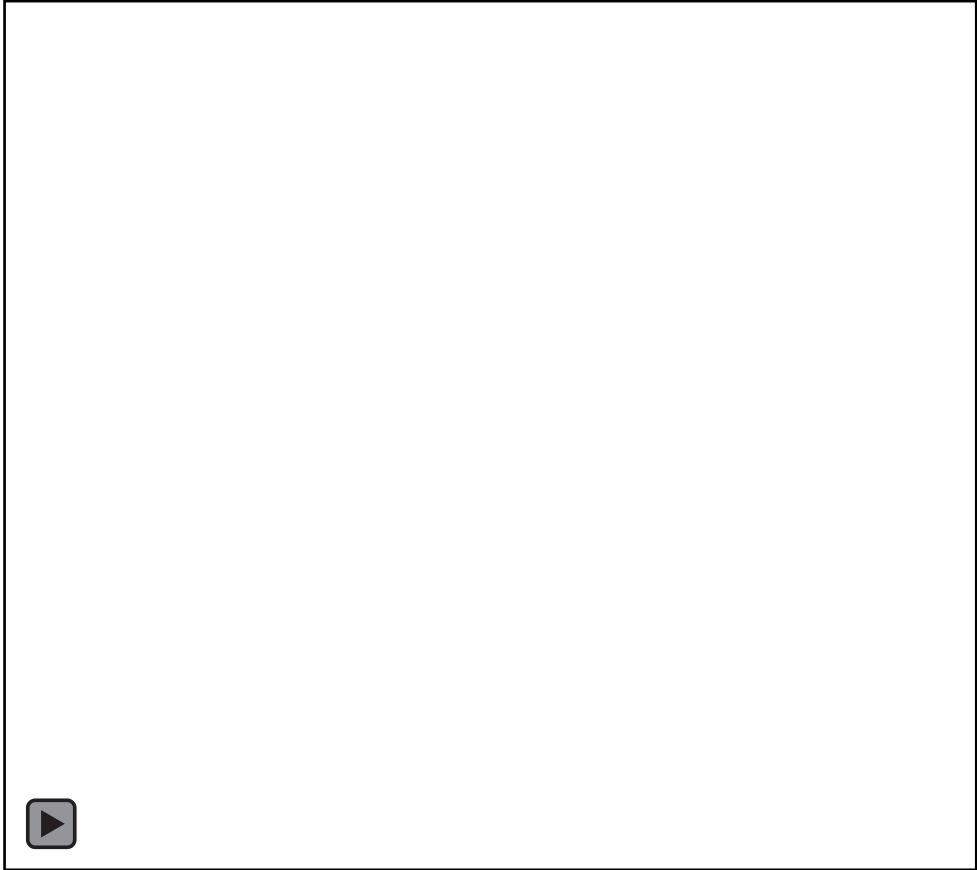
- **Aim**: Compare a stent-avoiding vs a stent-preferred after IVL preparation
- Retrospective, European multicentre study
- Symptomatic CFA lesions (R2-R5) will be included
- **Primary outcome**: target-lesion revascularisation
- Secondary outcomes: all-cause mortality, PP, major amputation, MALE, change in Rutherford class

Clinical Case 1

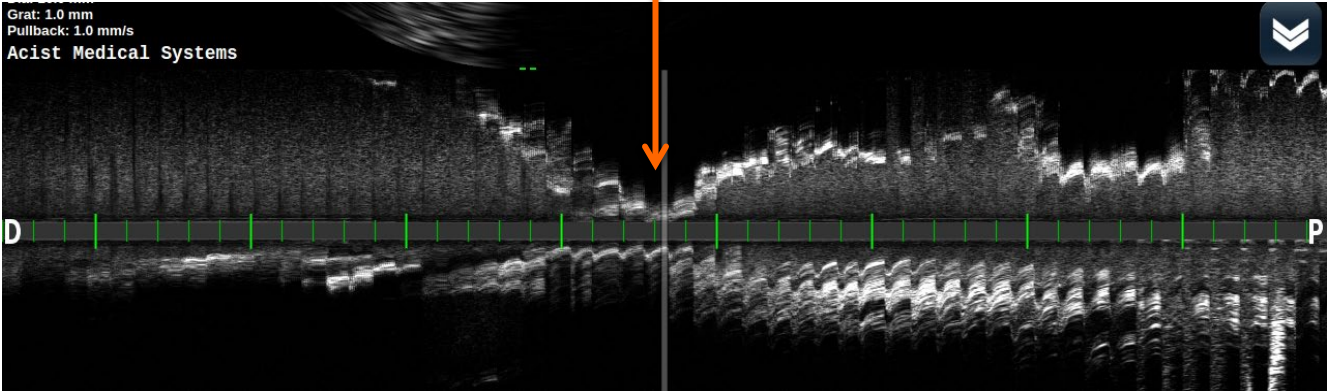
- Male, 71 y-o
- Arterial hypertension
- Coronary artery disease
- Rutherford 3
- ABI=0.4



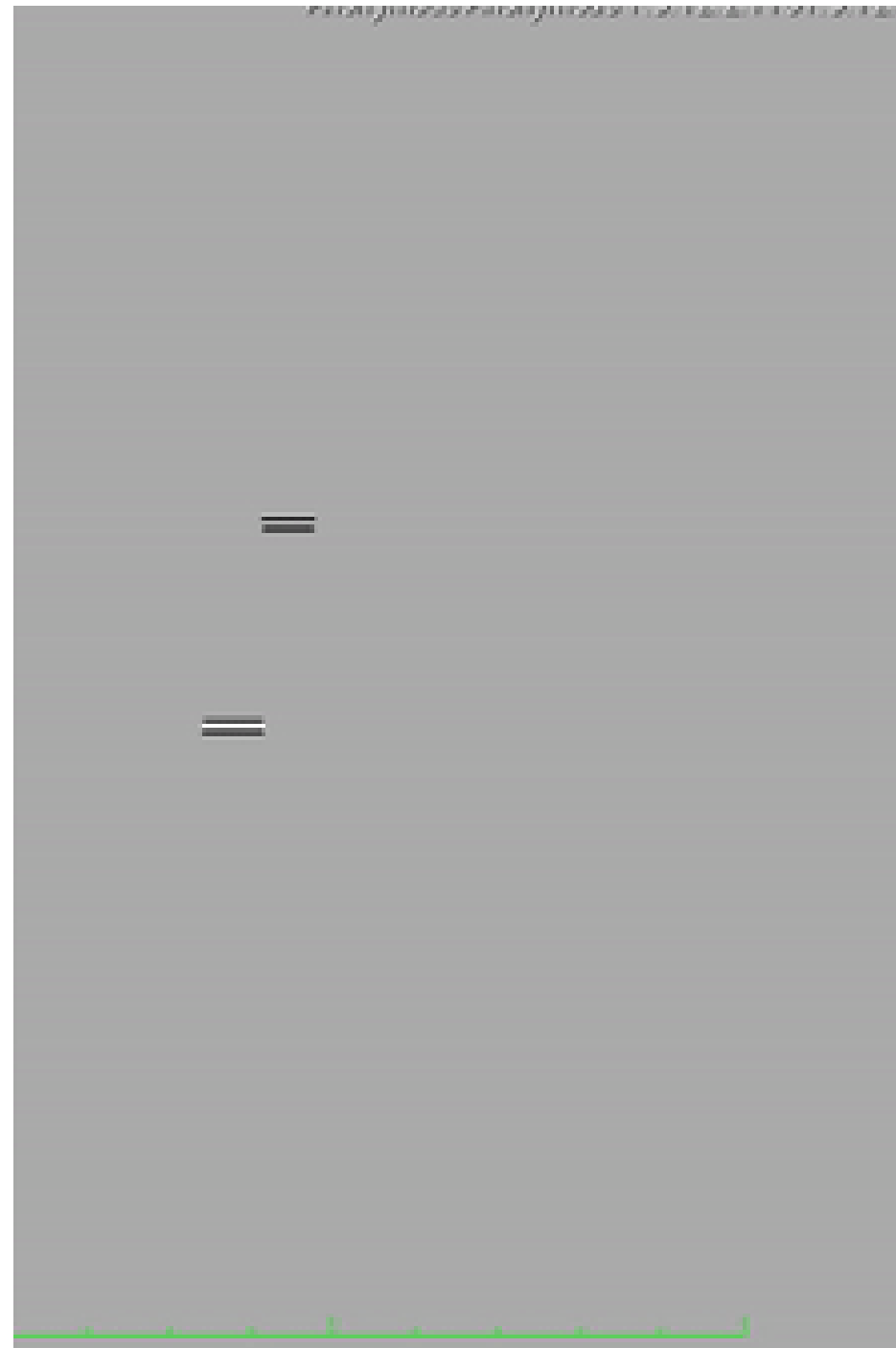
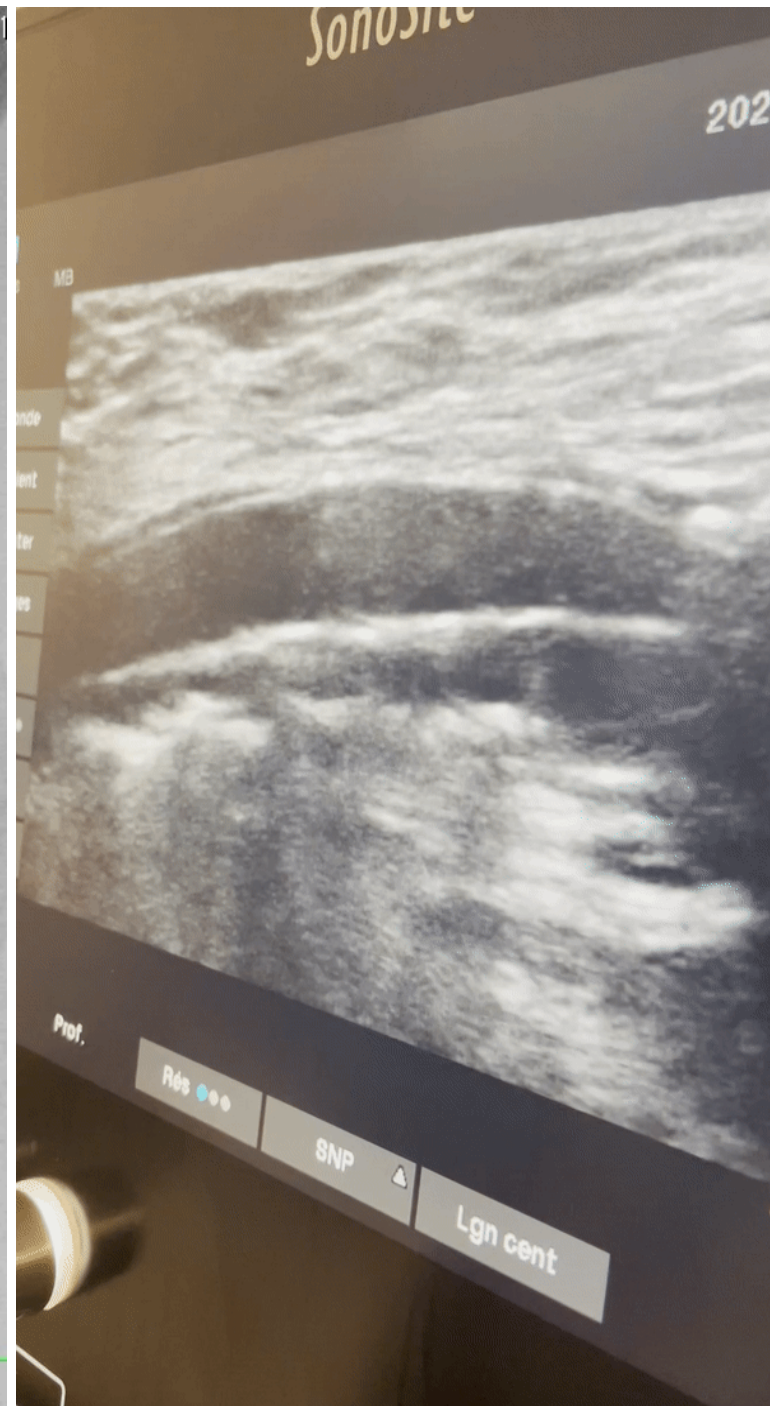
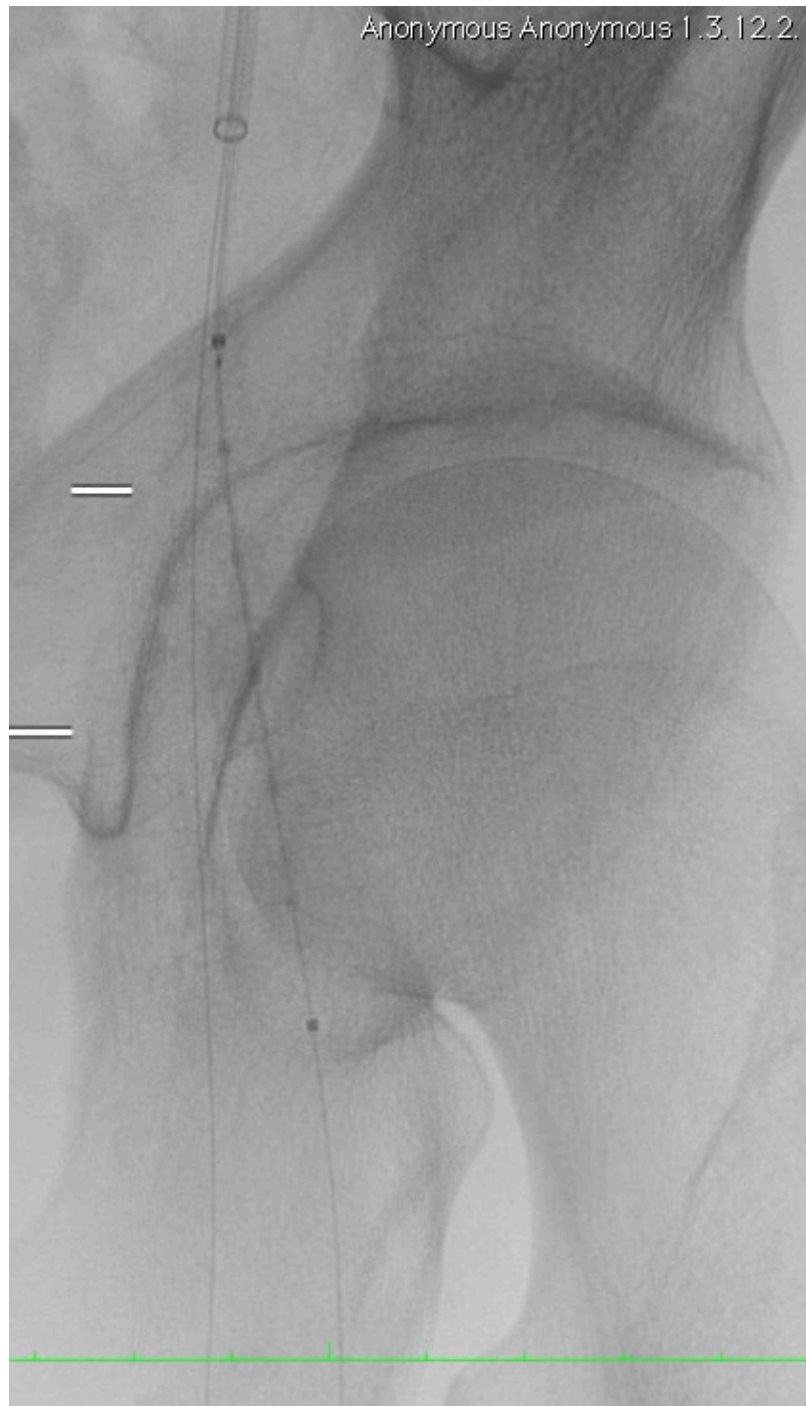
Type 3 AZEMA/MEDINA 1-1-1

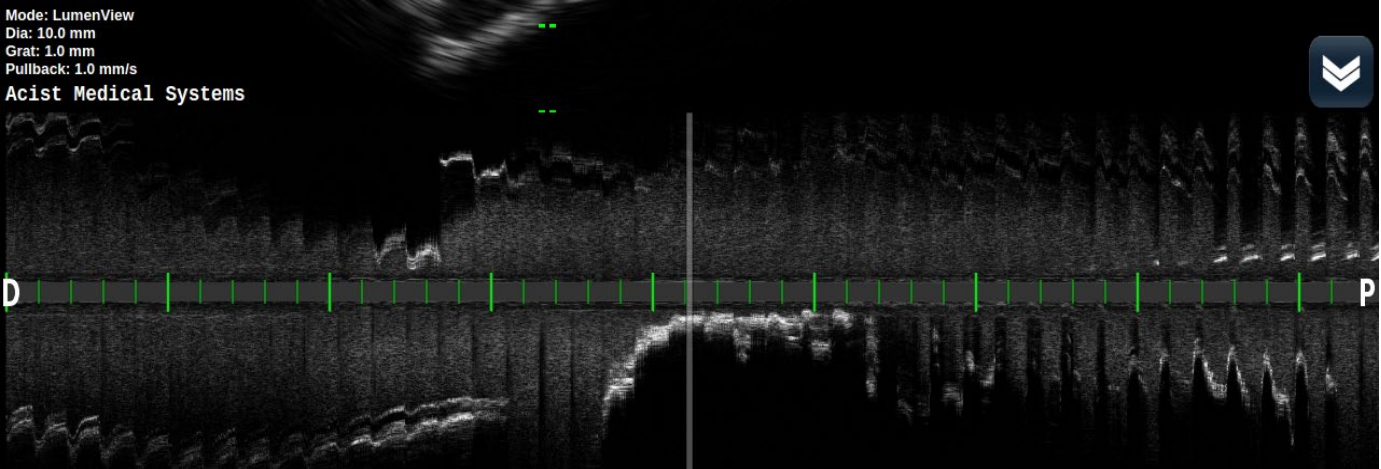
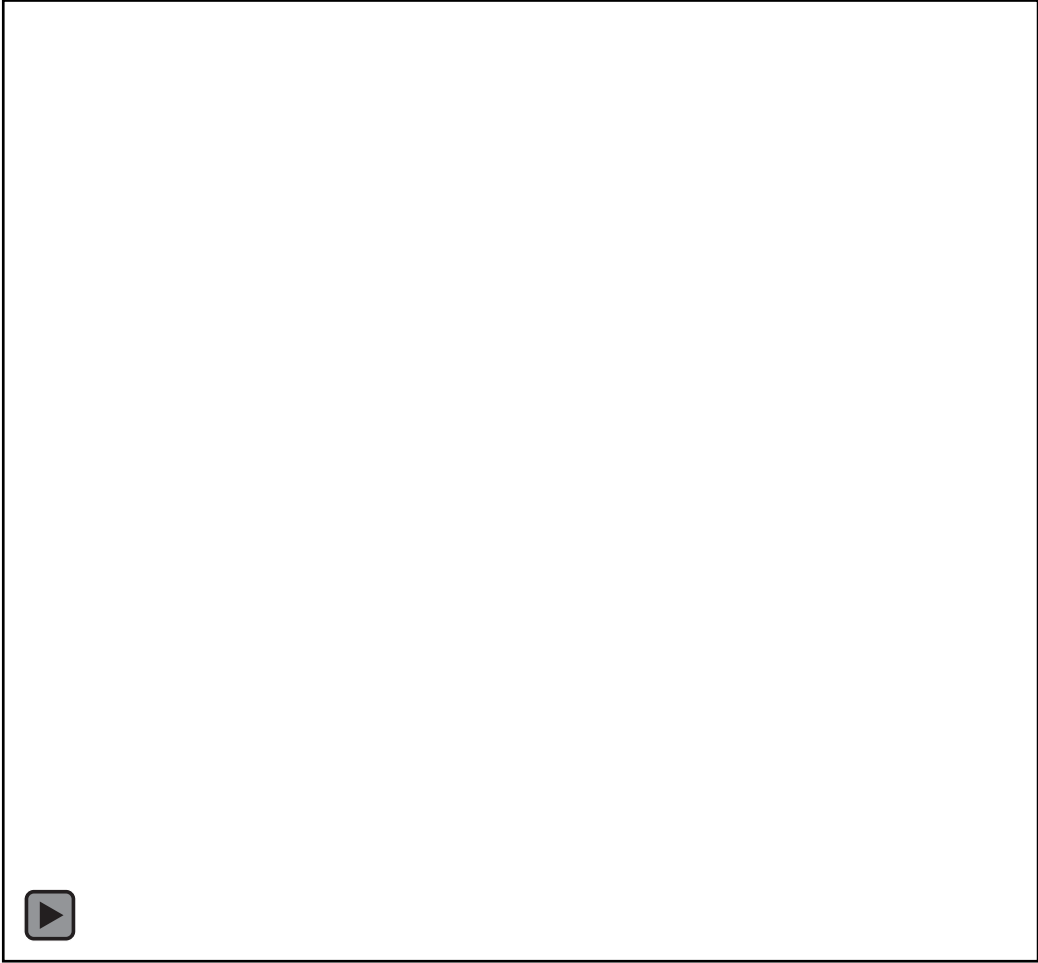


Calcified lesion

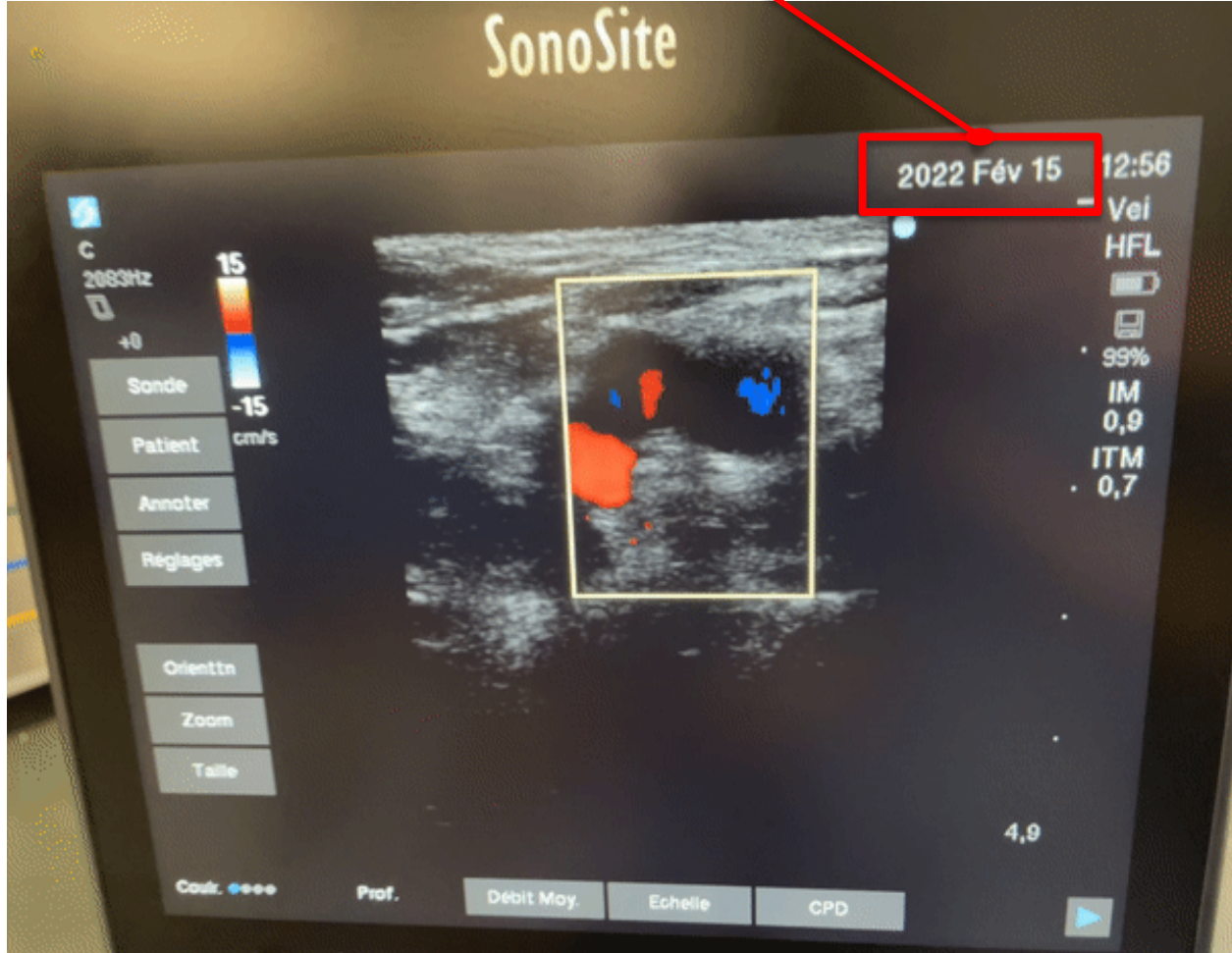


Anonymous Anonymous 1.3.12.2.1

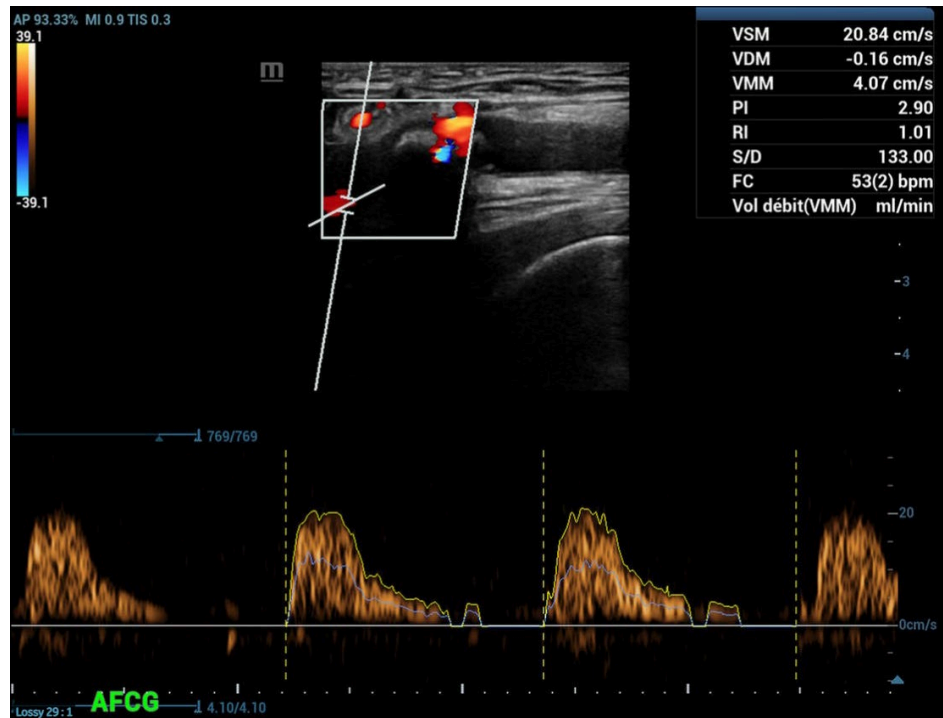




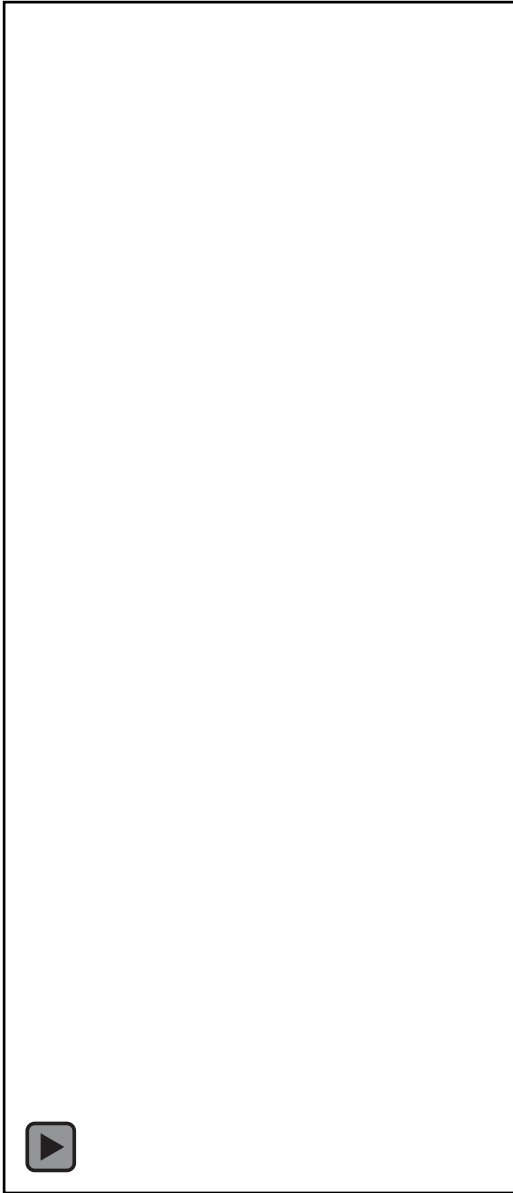
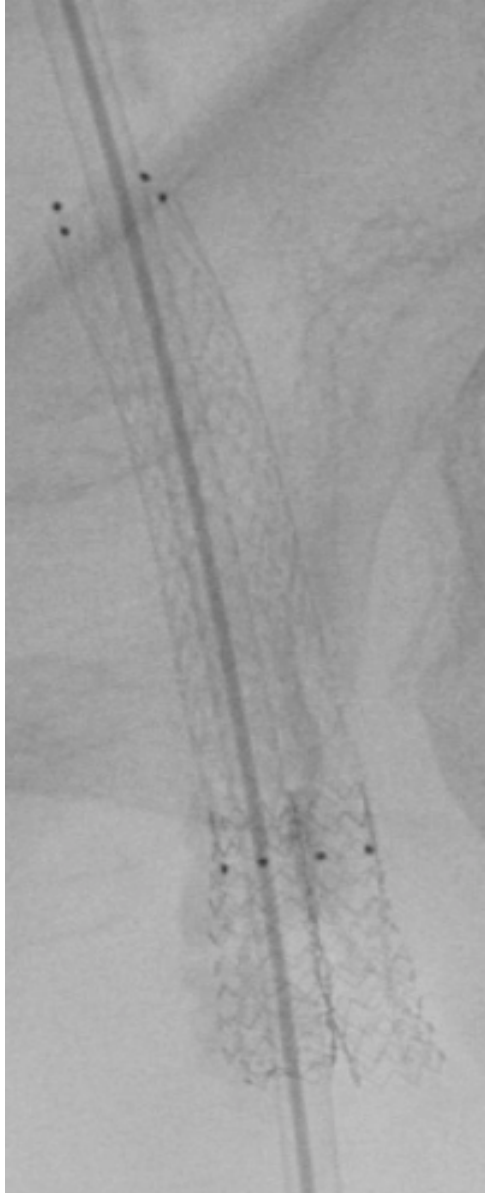
Februry 15th 2022



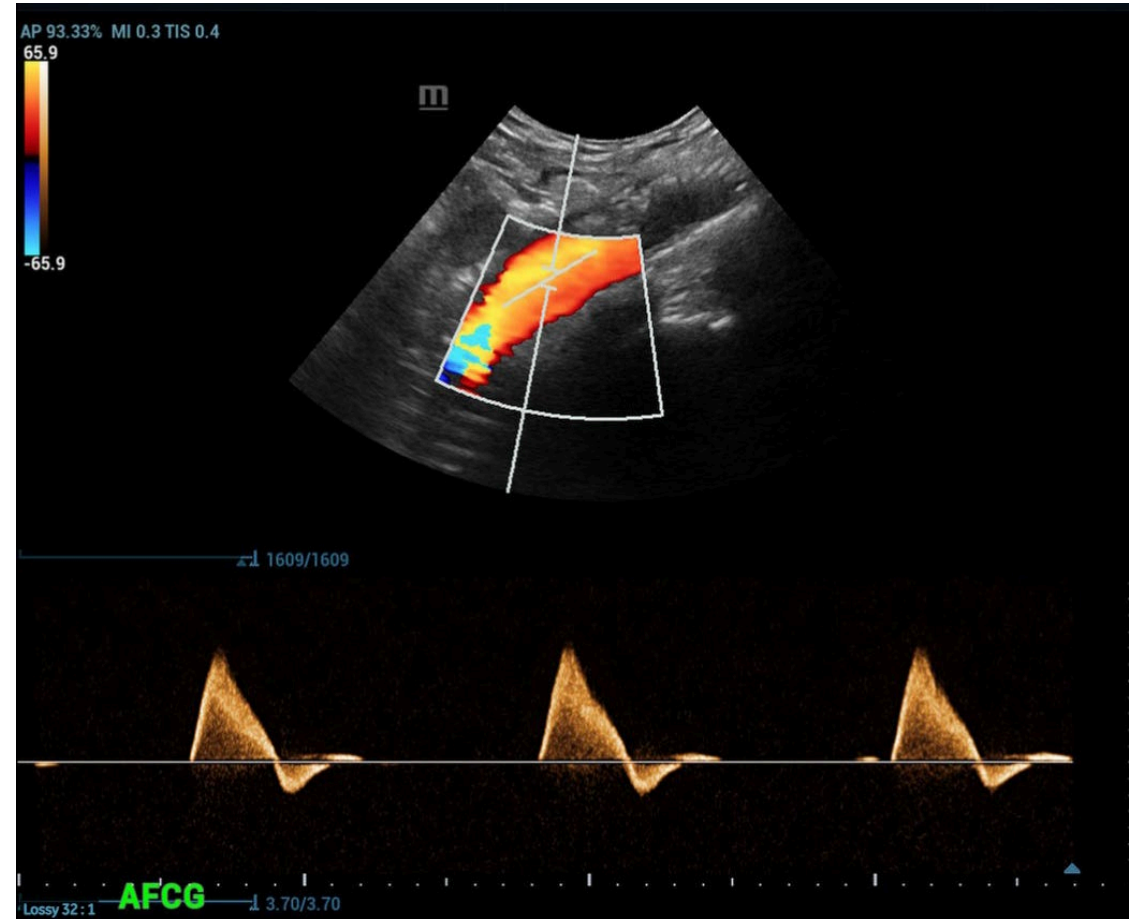
April 18th 2023



May 22nd 2023



December 12th 2024



Clinical Case 2



Preoperative CT-scan



Postoperative CT-scan

Take Home Message



85% of patients would have **suitable anatomy** for **ENDO** treatment



CFA is a **fixed segment**. No risk of **stent fracture**



Self expandable stents should be placed in the CFA.
« **Tour Eiffel** » technique seems to be the best strate



Thank You

Nasr.bahaa@gmail.com

Bahaa.nasr@chu-brest.fr



Bahaa Nasr



@bahaanasr



Faculté de Médecine
& Sciences de la Santé
BREST



