

SAPHENOUS ABLATION ON DIRECT ORAL ANTICOAGULANTS: SAFE, EFFECTIVE, AND DURABLE?

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Disclosures

- None

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Background

- Extensive review of both radiofrequency and laser venous ablation procedures have demonstrated excellent treatment effectiveness and durability for each modality.
- However, there is less data regarding treatment effectiveness and durability for these procedures in patients who are also on systemic anticoagulation – warfarin or DOACs.

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Modalities of Thermal Ablation

- RFA
- Endothermal Laser Ablation

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Effectiveness and Durability of Thermal Ablation

Authors	Mode of Ablation	Number of Subjects	Follow up	% with durable ablation
Golan and Glenn (2008)	RF- 1006 EVLA - 499	1,505	RF – 5 yrs EVLA – 17 mos	87% 98%
Christenson et al (2010)	EVLA	104	2 yrs	95%
Merchant and Pichot (2005)	RFA	1,222	5 years	87%

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Effectiveness and Durability of Thermal Ablation on Anticoagulation – **Warfarin**

Authors	Mode of Ablation	Number of Subjects	Follow up	% with durable ablation	Bleeding/ complications
Sharifi et al (2011)	RFA – 48 EVLA - 40	88	1 year	RF– 100% EVLA–100%	9% (minor)
Theivacumar et al (2009)	EVLA	22	1 year	83% (vs 96% control)	none
Gabriel et al (2012)		59 gsv/ssv - with perf	72 hrs	100 (%) (effective)	4% (minor)
Riesenman et al (2011)	EVLA	12	8 weeks	100%	none
Sufian et al (2017)	EVLA/RF	375	30 days	90%	minor

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Effectiveness and Durability of Thermal Ablation on Anticoagulation (warfarin)

Authors	Mode of Ablation	Number of Treated Veins	Follow up	% with durable ablation	Bleeding/ complications
Sharifi et al (2011)	RFA - 48 EVLA - 40	88	1 year	RF-100% EVLA-100%	9% (minor)
Theivacumar et al (2009)	EVLA	22	1 year	83% (vs 96% control)	none
Gabriel et al (2012)		59 gsv/ssv - with perf	72 hrs	100% (effective)	4% (minor)
Riesenman et al (2011)	EVLA	12	8 weeks	100%	none
Sufian et al (2017)	EVLA/RF	375	30 days	90%	minor
NYU 2017	RFA - 50 EVLA - 50	100	18 months 24-36 mos	RF/EVLA 92% RF/EVLA 89%	none

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Discussion – data for patients on warfarin

- Endovenous RFA and EVLA can be safely performed in patients receiving long-term warfarin therapy
- Our experiences demonstrated a similar short and mid-term durability for radiofrequency ablation and laser therapy.
- Anti-platelet therapy does not appear to impact closure rates, consistent with prior studies (Sharifi et. al 2011)

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What about saphenous ablation on DOACs?

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Objective

To evaluate the efficacy, durability, and safety of radiofrequency (RFA) and endovenous laser (EVLA) ablation of the great saphenous and small saphenous veins to treat symptomatic venous reflux in patients on therapeutic anticoagulation with DOACs

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Methods and Definitions

-Data was collected from a single-center institution (NYU Langone Health) -patients who had undergone either radiofrequency ablation or laser ablation procedures between **2016 and 2020**.

**87** vessels of patients (69 patients) on **DOAC** therapy at the time of endothermal ablation were selected for study. (largest to date). DOAC included apixaban 45%, Rivaraxaban 39%, Dabigatran (13%) and edoxaban (3%)

This group was compared to a matched group of **232** vessels (295 patients) undergoing endothermal ablation in patients not on anticoagulation

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Methods and Definitions

--The device used for radiofrequency ablation procedures: ClosureFast catheters (Medtronic) .

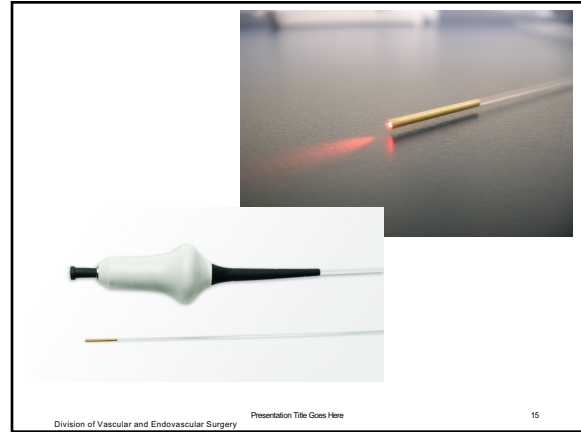
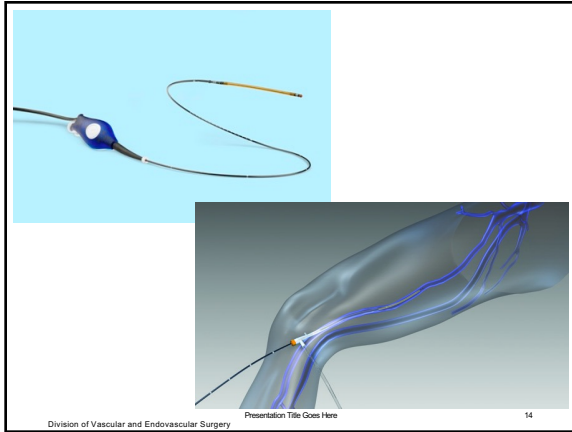
EVLt NeverTouch kits by Angiodynamics were used for the laser ablation. ( 810 nm diode Laser)

Technical details for the radiofrequency and laser ablation procedures - standard IFU of catheters. Tumescant anesthetic. Fiber tips 2.5 cm from SFJ or SPJ

Vein occlusion was defined as the absence of blood flow by duplex scan along the length of treated vein.

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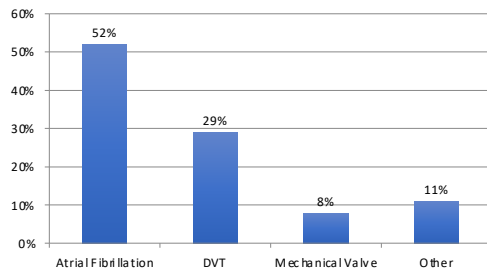
Methods

- Follow-up with duplex ultrasound at 1 week post-procedure, 6 months, 1 year

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Results: Indications for Anticoagulation



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Results

Veins treated with DOAC GSV 66 ( 76% ), SSV 21 (24%) ns  
 Veins treated control - GSV 247( 84% , SSV 48 (16%) ns

Vein max diameter 8mm both groups (NS)

Vein treatment length DOAC 35mm, Control 38mm (NS)  
 Indications for anticoagulation similar – afib (most common) , remote DVT

**DOAC pts – older 65 v 55 yrs ( P<.001)**  
**higher incidence previous DVT ( 44% vs 6% ) (p<.001)**

Mean VCSS, proportion of obesity distribution of race/ethnicity - ns

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Results – (DOAC)

-AC group more likely to use laser (16% vs 8%; p =.029) and AC group more likely to be male (70% vs 37% ;p<.001)

**No major or minor bleeding or EHIT in either group**

**Two patients in control group had remote DVT post procedure, none in DOAC group**

At 9 months treated vein ablated 94% DOAC group and 98% control group (NS)

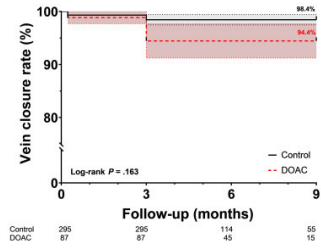
On multivariate analysis – DOAC not associated with and increased risk of recanalization (HR 5.76, 95%v CI)

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### Closure rates DOAC vs control



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### Conclusions

- The incidence of vein recanalization following venous ablation procedures while on anticoagulation is not worse as compared to controls and to the expected incidence described in the literature.
- Previously demonstrated in largest study to date for patient on Coumadin with follow up beyond 30 days - thermal ablation procedures on anticoagulated patients are effective and durable up to 12 (96%), 18 months (92%) and 24-36 months (89%)
- **First study on thermal ablation of patients anticoagulated with DOACs- effective and durable at 9 months (94%)**

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### Effectiveness and Durability of Thermal Ablation on Anticoagulation (warfarin and DOAC)

Authors	Mode of Ablation	Number of Treated Veins	Follow up	% with durable ablation	Bleeding/ complications
Sharifi et al (2011)	RFA - 48 EVLA - 40	88	1 year	RF- 100% EVLA-100%	9% (minor)
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NYU 2017 (warfarin)	RFA - 50 EVLA - 50	100	18 months 24-36 mos	RF/EVLA 92% RF/EVLA 89%	none
NYU 2021 (DOAC)	RF/EVLA	87	9 months	94%	none

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Thank You

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