

Description of a new technique: Endovenous Microwave Ablation Indications and Results

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Tim J Fernandez-Hart, Angie White, Emma Budd, Omar Abu-Bakr

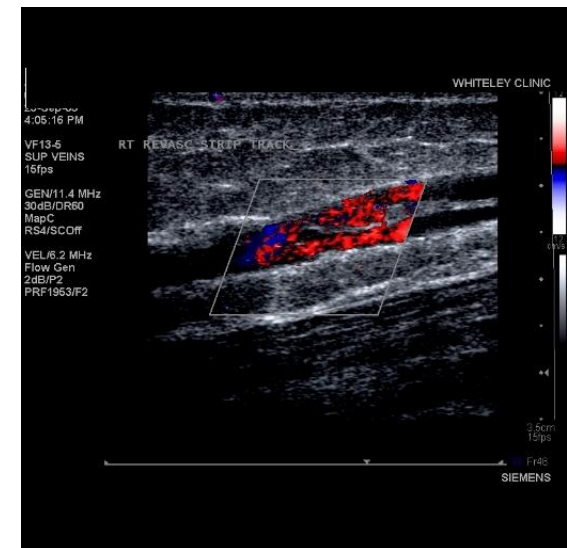
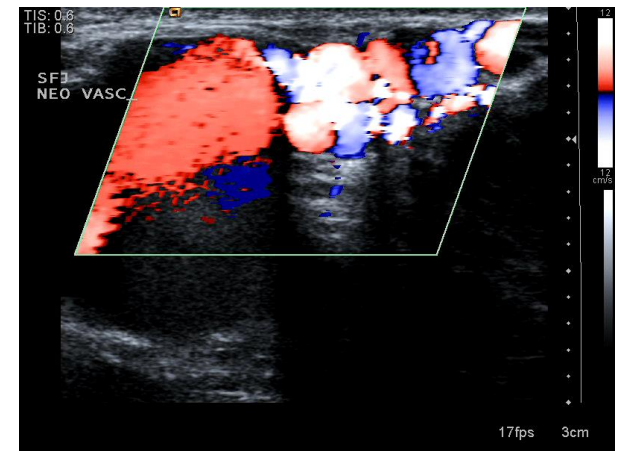
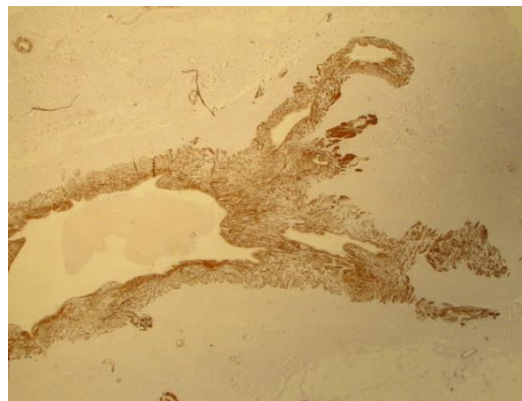
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Disclosures

- ▶ Founder The Whiteley Clinic
- ▶ Founder College of Phlebology

Why Endovenous Techniques?

► Strip tract revascularisation



Strip-track revascularization after stripping of the great saphenous vein
A Munasinghe, C Smith, B Kianifard, BA Price, JM Holdstock, **MS Whiteley**.
Br J Surg 2007; 94; 840-3

Why Endovenous Techniques?

- ▶ No groin recurrences
- ▶ Good long-term results

Original Article

Radiofrequency ablation
(VNUS closure[®]) does not
cause neo-vascularisation at
the groin at one year: Results
of a case controlled study

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ARTICLE IN PRESS

Eur J Vasc Endovasc Surg (2017) ■, 1–6

Fifteen Year Results of Radiofrequency Ablation, Using VNUS Closure, for the Abolition of Truncal Venous Reflux in Patients with Varicose Veins

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Endovenous Thermal Techniques

- ▶ AVF – 2011
- ▶ NICE CG 168 – 2013
- ▶ ESVS – 2015
- ▶ First Line Treatments:

- “Endothermal” ablation

- Radiofrequency ablation
- Endovenous laser ablation

? Steam ? Microwave

The screenshot shows the NICE website interface. At the top, there's a navigation bar with 'NICE National Institute for Health and Care Excellence', 'NICE Pathways', 'NICE Guidance' (selected), 'Standards and indicators', 'Evidence services', and a 'Sign in' button. Below this is a search bar. The main content area is titled 'Varicose veins: diagnosis and management' and is identified as 'Clinical guideline [CG168]' published on 'July 2013'. A sidebar on the left lists sections: Overview, Introduction, Patient-centred care, Key priorities for implementation, 1 Recommendations (highlighted), 2 Research recommendations, 3 Other information, and 4 The Guideline Development Group. The main content area under '1 Recommendations' lists four points: 1.1 Information for people with varicose veins, 1.2 Referral to a vascular service, 1.3 Assessment and treatment in a vascular service, and 1.4 Management during pregnancy. A note states the guidance is based on the best available evidence. At the bottom, it cites 'Eur J Vasc Endovasc Surg (2015) 49, 678–737'.

Editor's Choice — Management of Chronic Venous Disease Clinical Practice Guidelines of the European Society for Vascular Surgery (ESVS)

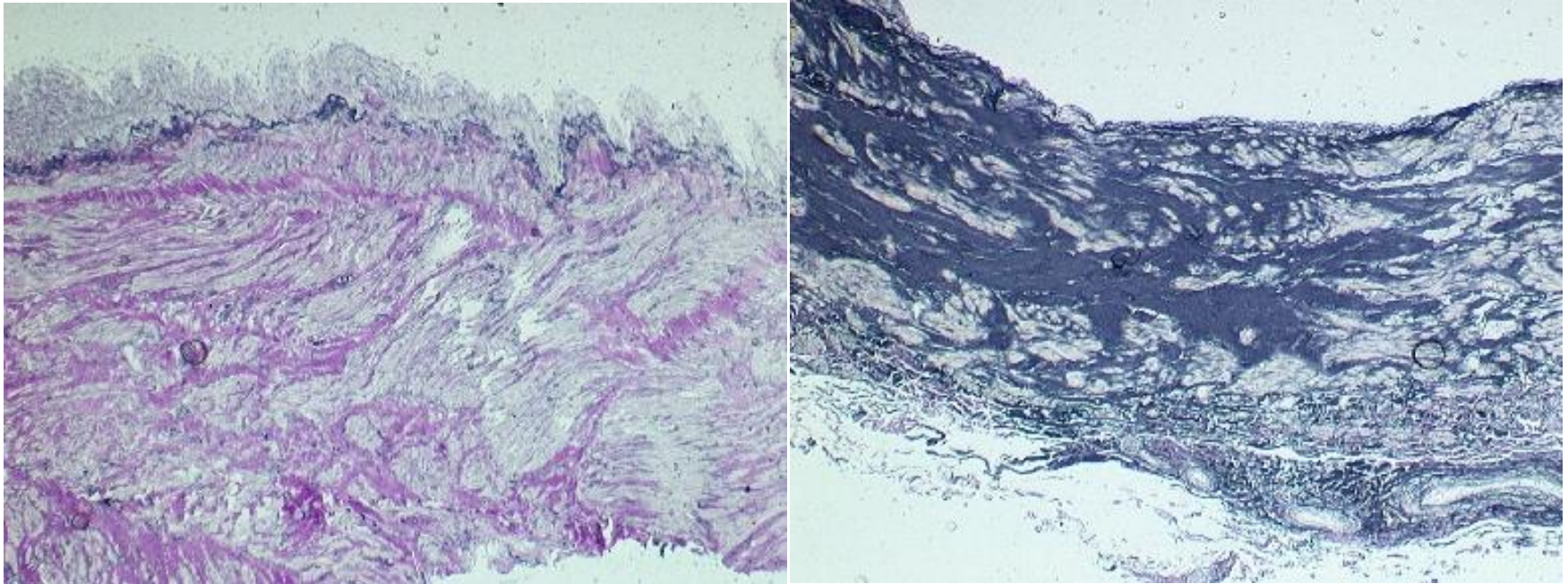
Writing Committee ^a C. Wittens, A.H. Davies, N. Bækgaard, R. Broholm, A. Cavezzi, S. Chastanet, M. de Wolf, C. Eggen, A. Giannoukas, M. Gohel, S. Kakkos, J. Lawson, T. Noppeney, S. Onida, P. Pittaluga, S. Thomis, I. Toonder, M. Vuytsteke,
ESVS Guidelines Committee ^b P. Kolh, G.J. de Borst, N. Chakfé, S. Debus, R. Hinchliffe, I. Koncar, J. Lindholt, M.V. de Ceuja, F. Vermassen, F. Verzini,
Document Reviewers ^c M.G. De Maesseneer, J. Blomgren, O. Hartung, F. Kaladji, E. Korten, M. Lugli,

The care of patients with varicose veins and associated chronic venous diseases: Clinical practice guidelines of the Society for Vascular Surgery and the American Venous Forum

Peter Gloviczki, MD,^a Anthony J. Comerota, MD,^b Michael C. Dalsing, MD,^c Bo G. Eklof, MD,^d David L. Gillespie, MD,^e Monika L. Gloviczki, MD, PhD,^f Joann M. Lohr, MD,^g Robert B. McLafferty, MD,^h Mark H. Meissner, MD,ⁱ M. Hassan Murad, MD, MPH,^j Frank T. Padberg, MD,^k Peter J. Pappas, MD,^l Marc A. Passman, MD,^m Joseph D. Raffetto, MD,ⁿ Michael A. Vasquez, MD, RVT,^o and Thomas W. Wakefield, MD,^p Rochester, Minn; Toledo, Ohio; Indianapolis, Ind; Helsingborg, Sweden; Rochester, NY; Cincinnati, Ohio; Springfield, Ill; Seattle, Wash; Newark, NJ; Birmingham, Ala; West Roxbury, Mass; North Tonawanda, NY; and Ann Arbor, Mich

Transmural Death

- ▶ Aim of all endovenous ablative techniques

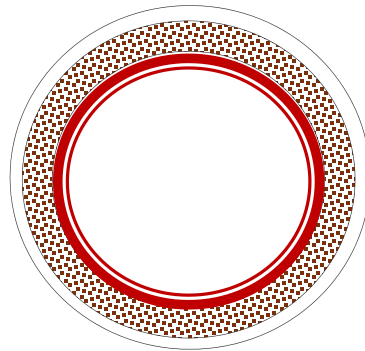


Mark S Whiteley, Judy Holdstock. Percutaneous radiofrequency ablations of Varicose Veins (VNUS Closure). In: Roger M Greenhalgh ed, Vascular and Endovascular Challenges . London; BibaPublishing 2004. p 361- 381

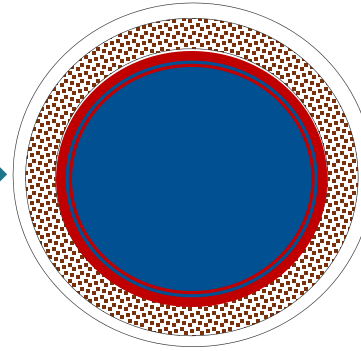
Transmural Death

- Large vein with thick wall
- Small vein with thin wall

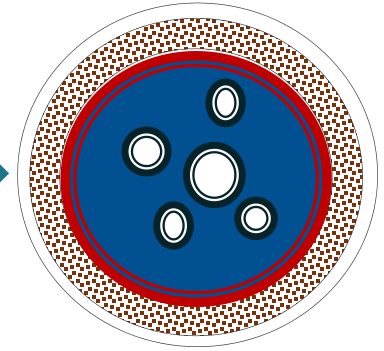
Intimal / Sub-total
Mural Damage



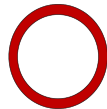
Intraluminal
Thrombosis



Recanalisation



Transmural
Death



Fibrosis



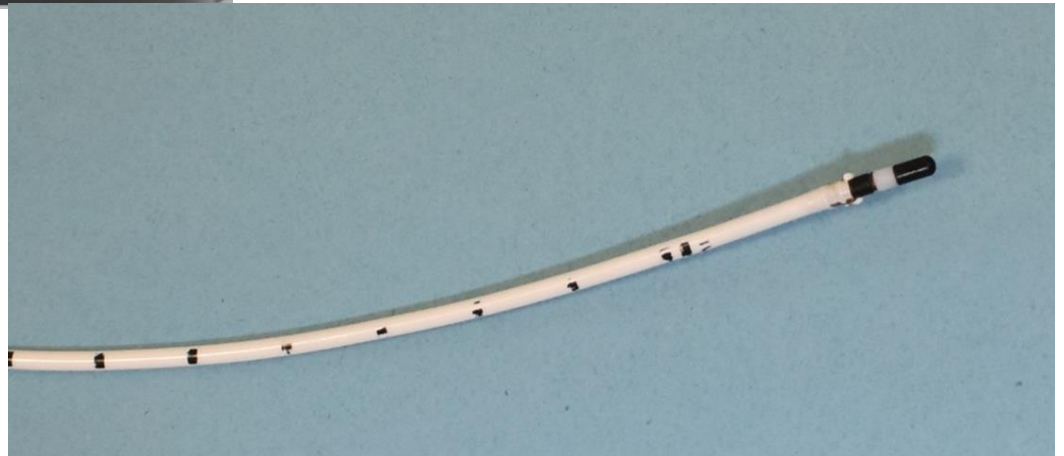
Involution



Endovenous Microwave Ablation

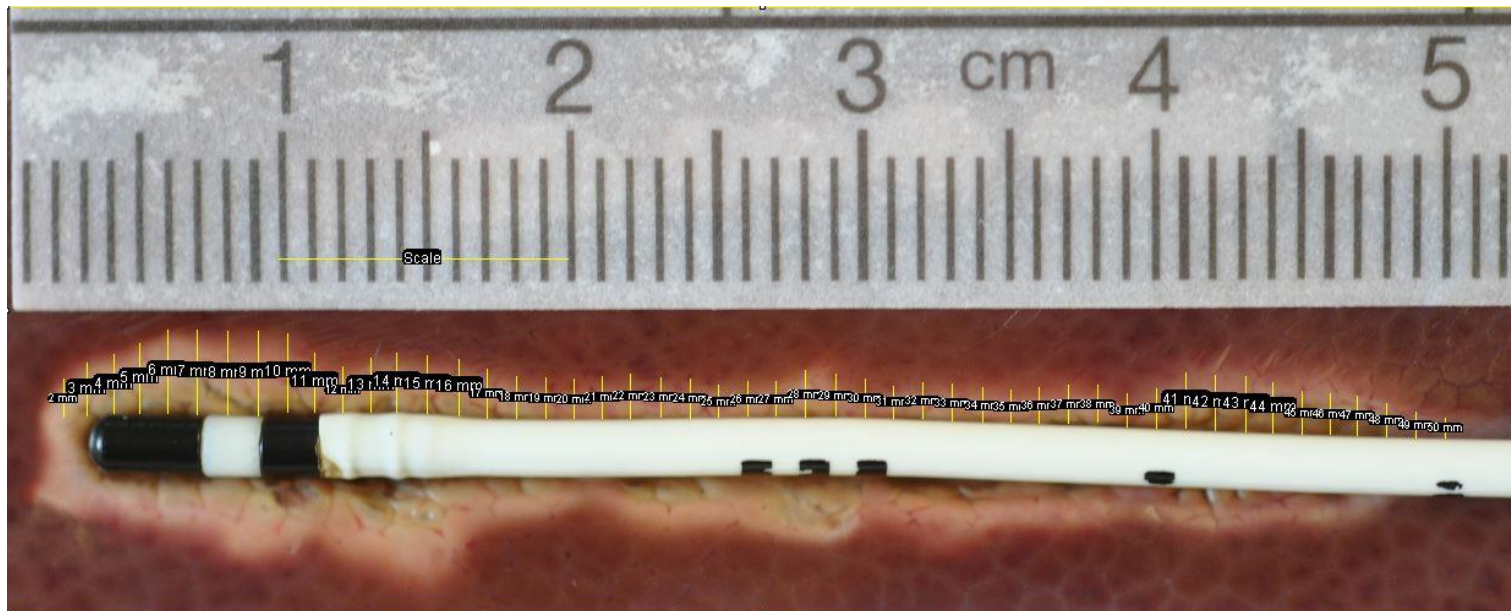


► ECO – China



EMWA optimization in Porcine Liver

- ▶ Measurements of thermal spread



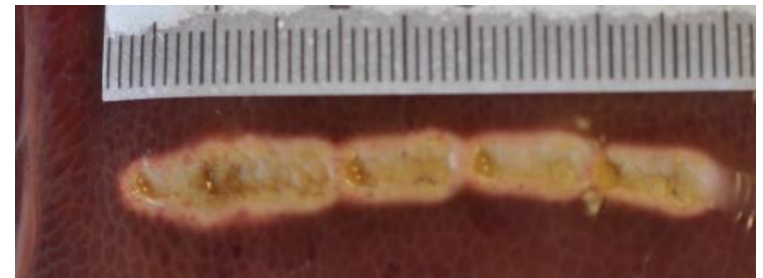
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EMWA optimization in Porcine Liver

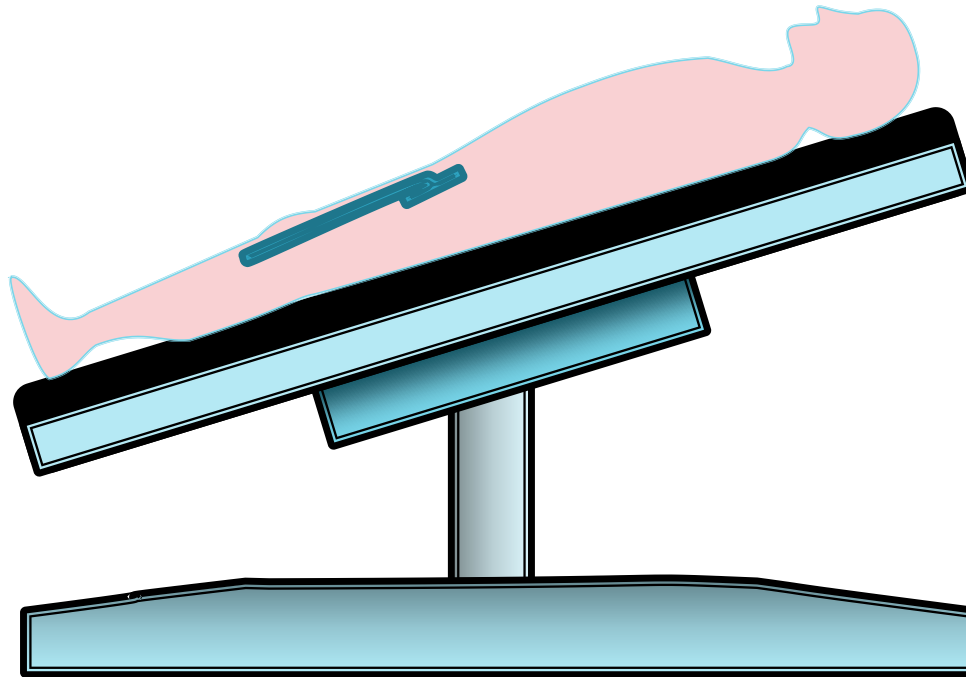
Power (Watts)	Duration per cm (Seconds)					
20	5	6	7	Double 7	8	9
25	5	6	7	7	8	9
30	5	6	7	7	8	9
35	5	6	7	7	8	9
40	5	6	7	7	8	9
45	5	6	7	7	8	9
50	5	6	7	7	8	9

EMWA optimization in Porcine Liver

- ▶ The Whiteley Clinic recommendations:
 - 40 Watts
 - 7 secs / cm interrupted
 - Double treatment top 5 cm
 - TRLOP – 2–4 cycles



Access veins



Local anaesthetic

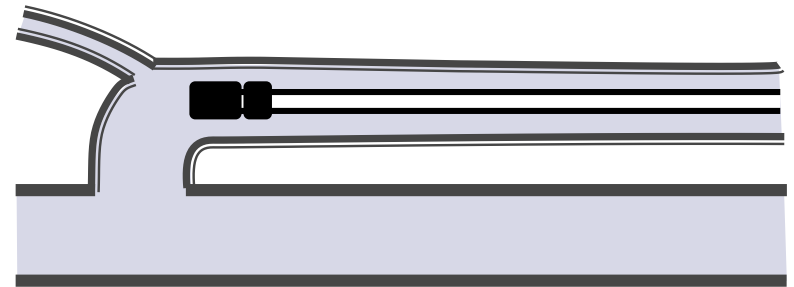
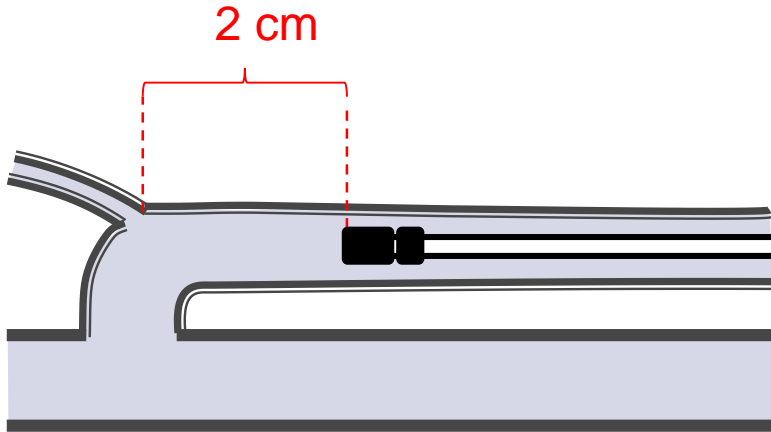


U/S Guided Seldinger Technique

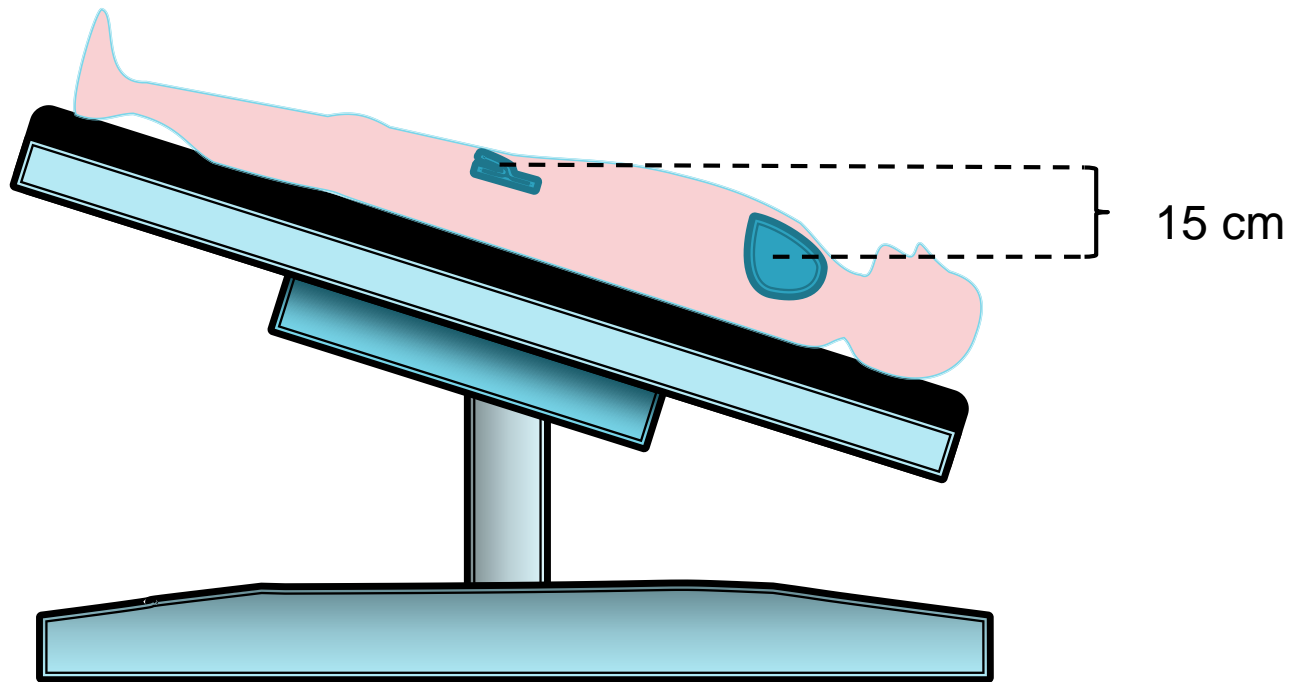


Pass Catheter up Vein into Position

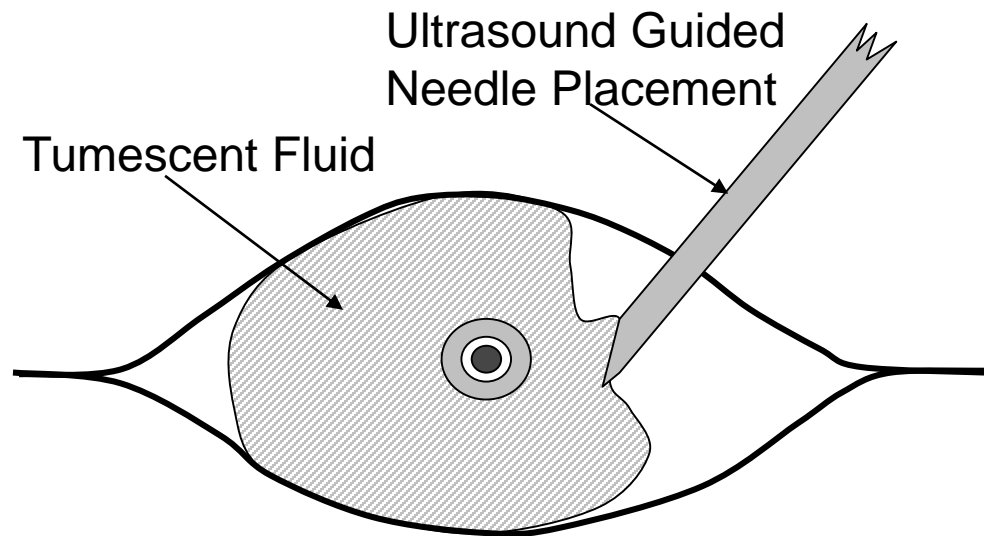
- ▶ No technical reason for 2cm
- ▶ Flush with Inferior Epigastric Vein



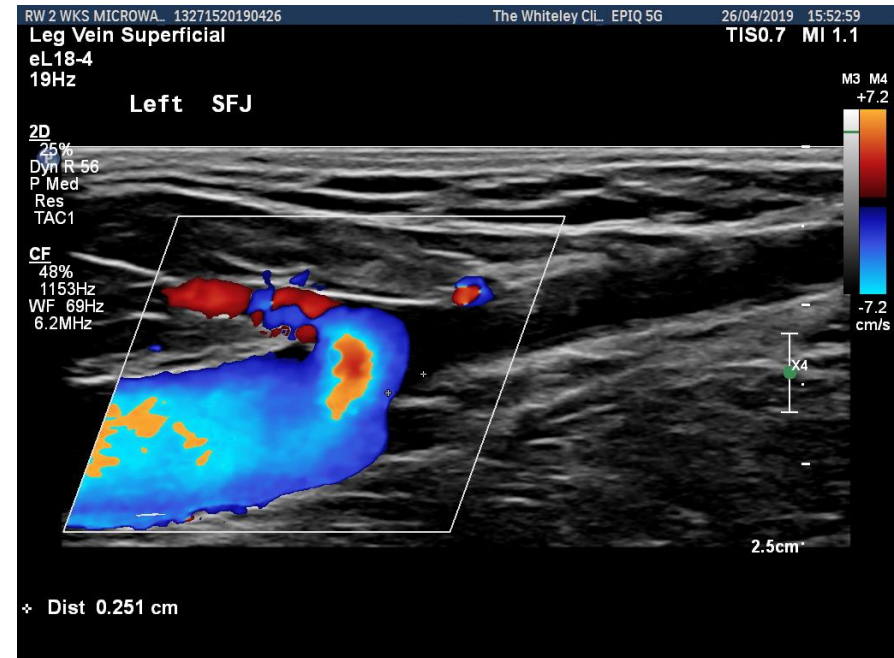
Head Down to Treat



Tumescence



Duplex Findings



Microwave v Laser

▶ Microwave (EMWA):

- ▶ Electromagnetic radiation
- ▶ Interacts with water
- ▶ Photons incoherent (“field”)
 - NO point heating
- ▶ No laser regulations
- ▶ No eye protection

• LASER (EVLA) – 1470nm:

- Electromagnetic radiation
- Interacts with water
- Photons Coherent (“beam”)
 - Point heating and steep gradient
- LASER Regulations
- Eye protection needed

Microwave v RFA

▶ Microwave (EMWA):

- ▶ Electromagnetic radiation
- ▶ Interacts with water
- ▶ Photons incoherent (“field”)
 - NO point heating
- ▶ No laser regulations
- ▶ No eye protection

• RFA:

- Alternating electric current
- Produces heat in tissue or device
- Tissue contact needed

Endovenous Microwave Ablation

- ▶ First Case in Europe –
February 2019 The Whiteley Clinic



- ▶ National News Nov 2019
Chris Evans – TV & Radio star



EMWA – Early Experience

- ▶ 43 patients
 - 34 Female : 9 Males
 - Age: Mean 54 years
- ▶ CEAP C2 – C6



EMWA – Veins Treated

Vein	Number	Diameter (mm)
IPV	138	2.0 – 4.5
GSV	51	4.0 – 18.0
SSV	27	7.0 – 12.0
AASV	27	3.0 – 9.0

EMWA – Results

- ▶ 3 weeks scan:
- ▶ 6 patients attended
 - 33 treated veins
 - 32/33 (97%) – closed / ablated target vein
 - 1/33 – Partial re-opening of an IPV – no reflux
 - Clinical success = 100%

Conclusion

- ▶ Endovenous Microwave (EMWA) appears to be safe and effective in venous ablation
- ▶ A new catheter based system targeting water with advantages over EVLA and RFA
- ▶ Monitoring through CoP Venous Registry
- ▶ Live cases
16–17 April 2020
London

