

***Role Of Duplex Guided Foam Sclerotherapy For The
Treatment Of Chronic Venous Ulcers***

**An Essay
submitted by**

Haitham Mohamed Mohamed Abd El Hameed

M.B.B.Ch
Faculty of Medicine
Cairo university

In partial fulfillment of Master Degree in Radiodiagnosis

supervised by:

Prof. Dr. Hanan Mohamed Issa

*Professor of Radiodiagnosis
Faculty of Medicine
Ain Shams University*

Dr. Ahmed Hassan Soliman

*Lecturer of Radiodiagnosis
Faculty of Medicine
Ain Shams University*

**Faculty of Medicine
Ain Shams University**



2016

بسم الله الرحمن الرحيم

قُلْ إِنَّمَا أَدْعِي إِلَىٰ رَبِّي ۚ إِنِّي اتَّبَعْتُ مَا مُلِكْتُ بِهِ نَفْسًا ۚ
وَأَنبِئُكُمْ بِمَا كُنْتُمْ تَعْمَلُونَ ۚ إِنِّي لَأَنبِئُكُمْ بِمَا كُنْتُمْ تَعْمَلُونَ ۚ
وَأَنبِئُكُمْ بِمَا كُنْتُمْ تَعْمَلُونَ ۚ إِنِّي لَأَنبِئُكُمْ بِمَا كُنْتُمْ تَعْمَلُونَ ۚ

صدق الله العظيم

(سورة البقرة: الآية 32)

ACKNOWLEDGEMENTS

Alhamdulillah for every thing in my life

How can I say thanks Mom , thanks Dad and thanks my brothers .

Then I would like to express my sincere gratitude to my advisor Prof. Hanan Issa professor of radiodiagnosis ,faculty of medicine Ain Shams univeristy for the continuous support of my essay .for her motivation, and immense knowledge. Her guidance helped me in all the time of research and writing of this this essay .

I can't express my great appreciation to my dear friend

Dr. Ahmed Soliman lecturer of radiodiagnosis ,faculty of medicine Ain Shams univeristy for his support guidance training and high respective kindness .

I would like to thank Prof. Mohamed El Gharib professor of radiodiagnosis ,faculty of medicine Ain Shams univeristy for his great help and supporting in my essay

Thanks my dear friends for your support

Haitham Mohamed Mohamed Abd El Hameed

LIST OF ABBREVIATIONS

AASV	Anterior Accessory Saphenous Vein
ATCV	Anterior Thigh Circumflex Vein
CEAP	Clinical Etiological Anatomical Pathophysiological
CFUWF	Chronic Venous Ulcer Wound Fluid
CT	Computed Tomography
CVD	Chronic Venous Disease
CVI	Chronic Venous Insufficiency
CVUWF	Chronic Venous Ulcer Wound Fluid
DDS	Double Syringe Technique
DM	Diabetes Mellitus
DVS	Deep Venous System
DVT	Deep Venous Thrombosis
ECM	Extracellular Matrix
ESCHAR	Effect Of Surgery And Compression On Healing And Recurrence
EVLA	Endovenous Laser Ablation
GAGs	Glycose Amino Glycans
GSV	Great Saphenous Vein
HTN	Hypertension
IL 1	Inter Lukin 1
Intersaph. V	Intersaphenous Vein
MAPK	Mitogen Activated Protein Kinase
MMPs	Matrix Metalloproteinases
MR venography	Magnetic Resonance Venography
NIVL	Nonthrombotic Iliac Vein Lesion

NSAID	Non Steroidal Anti Inflammatory Drugs
PASV	Posterior Accessory Saphenous Vein
PE	Pulmonary Embolism
PEP	Postexercise Pressure
PFO	Patent Foramen Ovale
POL	Polidocanol
PTCV	Posterior Thigh Circumflex Vein
PVI	Primary Valvular Incompetence
RT	Recovery Time
SF	Saphino Femoral
SF/SP	Saphino Femoral / Saphino Popliteal
SFJ	Saphino Femoral Junction
SIGN	Scottish Intercollegiate Guidelines Network,
SMC	Smooth Muscle Cells
SSV	Short Saphinous Vein/ Small Saphinous Vein
STS	Sodium Tertradecyle Sulfate
SVR	Superficial Venous Reflux
TE SSV	Thigh Extension Of The Small Saphenous Vein
TGF- β 1	Transforming Groth Factor Beta 1
TIMPs	Tissue Inhibitors Of Mmps
TNF	Tumer Nicrosis Factor
t-PA	Tissue Plasmenogen Activator
UGFS	Ultrasound Guided Foam Sclerotherapy
UGS	Ultrasound Guided Sclerotherapy
UV	Ultraviolet
VEGF	Vascular Endothelial Growth Factor
VH	Venous Hypertensin
VLU	Venous Leg Ulcer
VV	Varicose Veins

LIST OF FIGURES

Figure 1. 1	Lower Limb Venous Embryogenesis With The Three Angioguiding Nerves
Figure 1 . 2	The three compartments of the venous system of the lower limb, separated by three layers
Figure 1. 3	The ‘Egyptian eye’, echographic view of the saphenous compartment.Muscular fascia saphenous fascia ,great saphenous vein and tributary of GSV
Figure 1. 4	Superficial and perforating veins of the leg
Figure 1. 5	Superficial veins of the leg. Sapheno-femoral junction , great saphenous vein, anterior accessory saphenous vein , posterior accessory saphenous vein , anterior thigh circumflex vein , posterior thigh circumflex vein ,sapheno-popliteal junction , small saphenous vein , thigh extension of the small saphenous vein ,intersaphenous vein
Figure 1. 6	The small saphenous vein and lateral venous system of the calf
Figure 1 . 7	The different types and frequency of small saphenous vein (SSV
Figure 1 . 8	Superficial and perforating veins of the foot and ankle

Figure 1 . 9	Systematisation of the veins of the soleus muscle. The soleus muscle is divided into two parts, lateral and medial separated by a thick septum (S), also marked by the tibial nerve
Figure 1 . 10	Different types of the dorsal vein of the soleus (DVS)
Figure 1 . 11	The role of safety valve of the semimembranosus muscle. During the powerful ejection of the calf pump into the popliteal vein
Figure 1 . 12	deep venous system
Figure 1 . 13	Perforating veins of the leg and thigh
Figure 2.1	Superficial vein incompetence allows blood to reflux down the superficial veins but, providing the communicating veins are competent, the calf pump can usually cope with the additional load
Figure 2.2	Outflow tract obstruction. Deep vein obstruction causes upstream dilatation of the veins in the pump chamber and secondary incompetence of the communicating veins
Figure 2.3	Communication vein incompetence. Incompetence of the veins within the pump usually following deep vein thrombosis, sometimes in the communicating veins themselves leads to dilatation and incompetence of the communicating veins
Figure 2.4	Schematic view of cellular and molecular Changes in the skin and dermal tissues

Figure 2. 5	Diagrammatic representation of molecular events of Chronic venous ulceration .
Figure 2. 6	Venous leg ulcer :The irregular margins and wound base with pale slough mixed with healthy granulation tissue surrounded by circumferential atrophie blanche area
Figure 3. 1	Schematic view of diagnosis and treatment options according to pathophysiology
Figure 3. 2	Tessari `s method for foam generation
Figure 3. 3	Duplex guided sclerotherapy in the great saphinous vein
Figure 3.4	Duplex scanning of the foam injection
Figure 3. 5	Post Sclerotherapy External Compression
Figure 3. 6	Post Sclerotherapy internal Perivenous Compression
Figure 3. 7	Intravascular coagula are removed through a small incision using either a 18- to 21-gauge needle or number 11 blade
Figure 4. 1	female patient 42 years old with venous ulcer . the duplex is doing to show the bed veins.
Figure 4. 2	duplex shows dilated veins under the ulcer bed
Figure 4. 3	Local anesthesia to skin delivered
Figure 4. 4	Percutaneous puncture of target vessel
Figure 4. 5	foam injection under duplex guided
Figure 4. 6	duplex of the veins after faom injection

Figure 4. 7	(a) 50 years old male with big venous ulcer before sclerotherapy b) 6 weeks Venous ulcer after sclerotherapy
Figure 4. 8	. 54 years old male with right lower limb. A: Varices and chronic venous ulcer. B: Healed ulcer and resolution of varicose vein after the procedure .
Figure 4. 9	A 57-year-old woman with a varicose ulcer in the distal aspect of her leg before treatment (A) and 2.5 months after 3 sclerotherapy sessions (B).
Figure 4. 10	A 59-year-old woman with multiple ulcers in her right ankle and left leg and abundant varicose veins before the start of treatment (A) and 4 months after 4 sclerotherapy sessions (B).
Figure 4. 11	78-year-old male lateral aspect of the left lower leg and 5 months after foam injection
Figure 4 . 12	37 years old male right leg venous ulcer 3 years ago and 3 weeks after foam injection in the bed perforator vein.
Figure 4 . 13	shows fibrothrombotic vein in the ulcer bed after injection by 3 weeks
Figure 4 . 14	Pathologic vein in the ulcer bed 3 weeks after faom injection and the second session of foam injection for another vein related to the ulcer
Figure 4 . 15	shows healing process 6 weeks until compelate epithilization after 10 weeks

LIST OF TABLES

Table 2 .1	CEAP classification of chronic venous disorders
Table 2 .2	Advanced CEAP classification
Table 2 .3	Differential diagnoses for leg ulcers
Table 3. 1.	Categorization Of Sclerotherapy Complications.

CONTENTS

Introduction and aim of work.

Anatomy of lower limb veins..1

Pathophysiology and clinical picture of venous
ulcers.24

Duplex guided foam sclerotherapy for treatment of chronic venous ulcer ..
.45

Illustrative cases.65

Summary and conclusion.71

References74

Arabic summary.83