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**Endovenous Laser Ablation and Radiofrequency Ablation
versus Conventional Surgery in Treatment of Primary
Varicose Vein of the Lower Limb
(Prospective Randomized Controlled Study)**

Thesis

*Submitted for Partial Fulfilment of Master Degree in
General Surgery*

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2018

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

لَسْبَدَانِكَ لَا نَعْلَمُ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْعَظِيمُ

صدق الله العظيم

سورة البقرة الآية: ٣٢

Acknowledgment

*First of all, thanks to **Allah** whose magnificent help was the main factor in completing this work.*

*It was a great honor to be supervised by **Prof. Dr. Mohamed Mohamed Bahaa Eldin** Professor of general surgery, faculty of medicine, Ain Shams University and **Prof. Dr. Mohamed Ahmed Hassan Rady** Assistant Professor of general surgery, faculty of medicine, Ain Shams University. And I would like to express my sincere gratitude for their encouragement, guidance and support they gave me throughout this work.*

*Also, I would like to express my deepest respect and thanks to **Dr. Ahmed Mohamed El-Mahdy Dessouki** Lecturer of vascular surgery, faculty of medicine, Helwan University for his wise guidance that was of great help in presenting this work in convincing form.*

*Finally, I would like to thank **my family, all the staff members** in the hospital and **my friends** who helped me throughout the performance of this work.*

Hossam Eldin Ibrahim Abd Elhamid

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List of Abbreviations

Abb.	Full term
AASV	<i>Anterior accessory saphenous vein</i>
AC	<i>Anatomical compartment</i>
AP	<i>Arterial pressure</i>
ASVAL	<i>Ambulatory selective varices ablation</i>
ATCV	<i>Anterior thigh circumflex vein</i>
AVP	<i>Ambulatory venous pressure</i>
CFA	<i>Common femoral artery</i>
CFV	<i>Common Femoral Vein</i>
CHIVA	<i>Cure Conservatrice et hemodynamique de l'Insuffisance Veineuse en Ambulatoire</i>
CUS	<i>Compression ultrasonography</i>
CVD	<i>Chronic venous Disease</i>
CVI	<i>Chronic venous Insufficiency</i>
DVS	<i>Deep venous system</i>
DVT	<i>Deep venous thrombosis</i>
EVL	<i>Endovenous Laser Ablation</i>
GSV	<i>Great saphenous vein</i>
PASV	<i>Posterior accessory saphenous vein</i>
PIN	<i>Perforation-invagination</i>
PTCV	<i>Posterior thigh circumflex vein</i>
PTS	<i>Post thrombotic syndrome</i>
PV	<i>Perforating veins</i>
RFA	<i>Radiofrequency ablation</i>
RVO	<i>Residual venous obstruction</i>
SFJ	<i>Saphenofemoral junction</i>
SSV	<i>Small saphenous vein</i>

List of Abbreviations (cont...)

Abb.	Full term
<i>SVS</i>	<i>Superficial venous system</i>
<i>VAS</i>	<i>Visual analogue scale</i>
<i>VLU</i>	<i>Venous leg ulcer</i>
<i>VV</i>	<i>Varicose veins</i>

Abstract

Alternative treatments such as endovenous ablation of the GSV with laser (EVLA), radiofrequency ablation (RFA) and ultrasound-guided foam sclerotherapy (UGFS) have gained popularity. Performed as office-based procedures using tumescent local anaesthesia, the new minimally invasive techniques have been shown in numerous studies to eliminate the GSV from the circulation safely and effectively.

Endovenous Thermal Ablation procedures are catheter-directed, ultrasound (US)-guided thermal methods for treatment in varicose veins disease

Compared with conventional surgery, EVLA is thought to reduce postoperative discomfort and pain, with a lower complication rate after treatment for avoidance of a groin incision and dissection at the saphenofemoral confluence. Cosmetic demands are also better satisfied. Non-controlled clinical trials have shown that the ablation rate of GSV after EVLA is over 90%. However, risks of EVLA remain in terms of recanalization and neoreflux via junctional tributaries.

Keywords: Anterior accessory saphenous vein - Common femoral artery - Endovenous Laser Ablation

INTRODUCTION

Chronic venous disorders encompass a spectrum of venous diseases from simple telangiectasia and reticular veins, varicose veins, leg edema to more severe forms, including hyperpigmented skin changes, dermal sclerosis, and ulcer formation (*Santler & Goerge, 2017*).

Chronic venous disorders with manifestations specific to abnormal venous function are termed chronic venous insufficiency (CVI). A distinguishing feature of chronic venous disease (CVD) and (CVI) is that (CVI) indicates more advanced form of chronic venous disorders (*Aleksiejew-Kleszczyński and Jagielska-Chwała, 2015*).

Varicose veins have been recognized since the advent of recorded history, and manifestations of CVI, including edema and ulceration, since biblical times. The use of compression therapy dates back to roman times, with foot soldiers using tight wraps to reduce discomfort induced by prolonged standing (*Raffetto and Ederhardt, 2014*).

Modern understanding of CVI pathophysiology arose with the work of Brodie and Trendelenberg in the 1850s and 1890s describing superficial and deep venous reflux. Trendelenberg was the first to introduce surgery for varicose veins marking the beginning of modern vascular surgery for this problem (*Raffetto and Ederhardt, 2014*).

Interventional treatment of superficial venous incompetence can be accomplished by techniques that result in removal, ablation, or ligation of the refluxing venous segment. Current options include high ligation, ligation and stripping, endovascular ablation, sclerotherapy, and phlebectomy (*Aleksiejew-Kleszczyński and Jagielska-Chwała, 2015*).

AIM OF THE WORK

The aim of this study is to determine, whether endovenous ablation methods (radiofrequency and laser) have any advantages or disadvantages in comparison with conventional surgery, in the treatment of primary varicose vein.

Chapter 1

HISTORY OF VARICOSE VEIN TREATMENT

Among the first to recommend surgical treatment of varicose vein was Hippocrates earlier than 300 BC. He suggested puncturing the varicosities at multiple points. Since that time, varicosities have been cauterized, twisted, poked, avulsed, ligated, divided and stripped (*Tretbar, 1999*).

In the late 1800s, Trendelenburg introduced a mid thigh ligation of the GSV. The outcomes were variable, and this procedure was later modified by Trendelenburg's student Perthes, who advocated a groin incision and a ligation of the GSV at the saphenofemoral junction (SFJ). Later, even better outcomes were found if saphenectomy (removal of the GSV) with ligation at the SFJ was performed in place of ligation alone. In a randomized trial, two thirds of patients treated with ligation without saphenectomy could be expected to need reintervention within 5 years for recurrent reflux, either from recanalization or from collateral formation around the ligated GSV (*Recek, 2012*).

Surgical techniques for eliminating superficial venous reflux started to develop over 100 years ago. Keller introduced saphenous vein invagination and stripping, while Mayo pioneered the use of an external stripper to remove saphenous