A Comparative Study of Nd:YAG Laser Versus Combined Sequential Delivery of Intense Pulsed Light and Nd:YAG for Treatment of Lower Extremity Talangiectasia and Reticular Veins

Thesis

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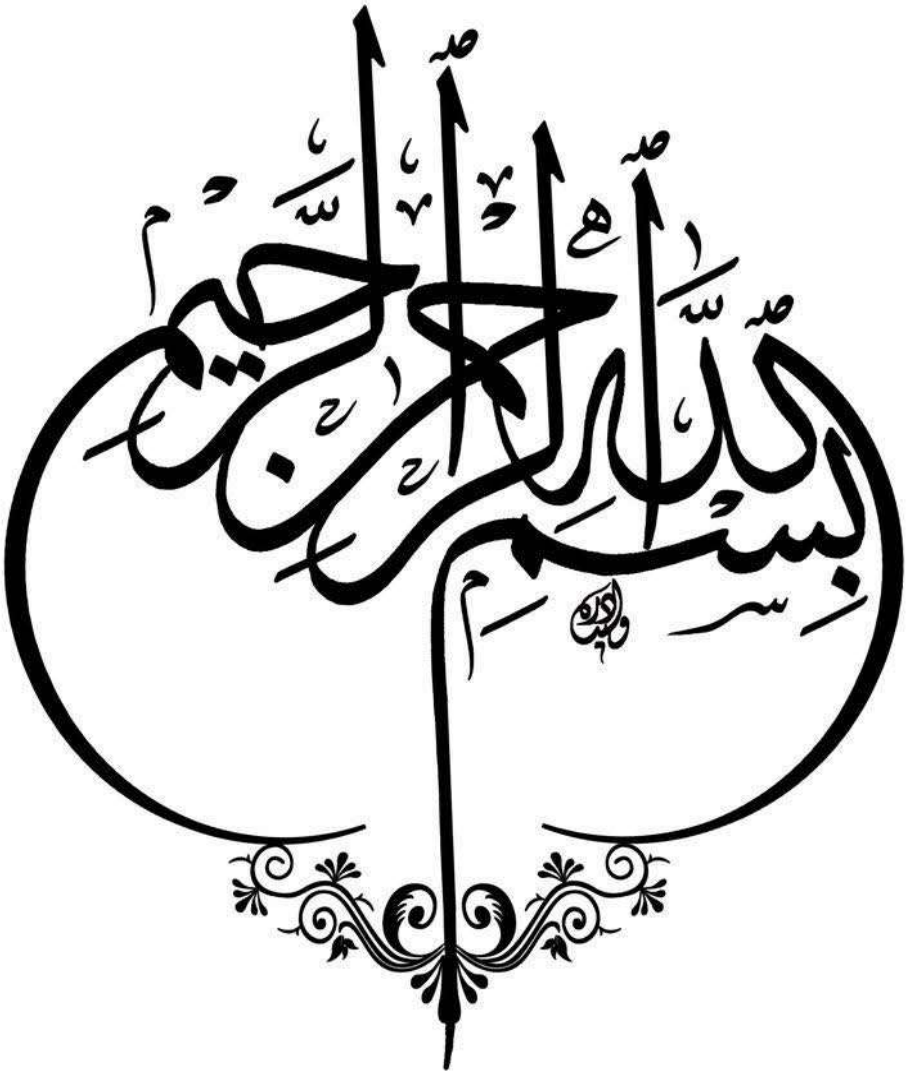
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List of Abbreviations

Abb.	Full term
BPH	*Benign prostatic hyperplasia*
CEAP	*Comprehensive Classification System for Chronic Venous Disorders*
DVT	*deep venous thrombosis*
GVHD	*Graft Versus Host disease*
HIV	*Human Immunodefiency Virus*
IPL	*Intense Pulsed Light*
IQR	*Interquartile range*
J/Cm²	*Joule/centimeter²*
KTP	*Potassium titanyl phosphate*
LANAP	*Laser assisted new attachment protocol*
LASER	*Light amplification by stimulated emission of radiation*
Mm	*Millimeter*
MS	*Millisecond*
Nd:Yag	*Neodymium-doped yttrium aluminum garnet laser*
NICE CG	*National institute of health and care excellence clinical guidelines*
Nm	*Nanaometer*
Q-switched	*Quanta switched*
SPSS	*Statistical Package for Social Science*

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INTRODUCTION

Telangiectasia is a confluence of dilated intradermal venules less than 1 mm in caliber. Synonyms include spider veins, hyphen webs, and thread veins. They represent dilatations of preexisting vessels without any new vessel growth. The color of the telangiectasia depends on the caliber of the dilated venule. Large dilatations (up to 1 mm) are dark blue in color; the smallest (0.1 mm) are very superficial and are red in color. They do not empty on limb elevation It is suggested that the difference in the color of the telangiectasia results from difference in the oxygenation in capillary loops. The red ones represent dilatation from the arterial and the blue from the venous loop of the capillary ***(Mortimer et al., 2010).***

Reticular veins are dilated bluish subdermal tortuous veins of 1-4 mm in diameter. Most of the patients are women and are asymptomatic. Majority seek medical attention for cosmetic reasons. However, some women have symptoms of lower extremity throbbing pain and aches, worse during menstrual periods. The throbbing pain is aggravated by prolonged standing and sitting and relieved by elevation and compression stockings. It is surprising that the severity of symptoms is totally out of proportion to the size of the involved veins ***(Vaidyanathan, 2015)***.

Laser is one of the fast growing fields directly affecting dermatology**.** Laser therapy has offered effective and non-

scarring treatment modalities to patients with vascular lesions including telangiectasia. In vascular lesions the targeted chromophore is oxyhemoglobin and deoxyhemoglobin ***(Haiguang et al., 2017).***

Long-pulsed neodymium-doped yttrium aluminum garnet laser (Nd:YAG) is used in many dermatological diseases. In vascular lesions the laser's chromophore is the oxyhemoglobin and deoxyhemoglobin. The laser's beam is poorly absorbed in water and absorbed by hemoglobin. Due to its poor absorption in water, the laser penetrates deeply into the tissue. As it passes through tissues, the laser beam emits heat and thus affects tissue down to the depth of about 7-10 mm, a process called selective photothermolysis. Its selective absorption by hemoglobin results in selective photocoagulation within the blood vessels making it a perfect choice for treating vascular lesions including telangiectasia ***(John et al., 2016).***

Intense Pulsed Light (IPL) devices are not lasers but rather contain a powerful flash lamp that produces noncoherent, polychromatic light that can be tuned to provide a variety of wavelengths, fluences, and pulse durations. One of the major advantages of IPL is its absorption by both oxygenated and deoxygenated hemoglobin, its ability to penetrate deep into the tissues and its relatively large head size causing minimal purpura ***(Sadick and Sorhaindo, 2014).***

AIM OF STUDY

The aim of current work is to compare the effectiveness of Nd:YAG versus combined sequential IPL and Nd:YAG in treatment of lower limb telangiectasia and reticular veins.

Chapter 1

TELANGIECTASIA AND RETICULAR VEINS

I- Definition of telangiectasia:

Talngiectasia is an abnormal dilation of preexisting intradermal vessels less than 1 mm in diameter without the growth of new vessels. They are also known as spider veins or thread veins. Reticular veins are dilated bluish subdermal tortuous veins of 1-4 mm in diameter ***(Vaidyanathan, 2015).***

II- Clinical Presentation:

Telangiectasia and reticular veins are often a source of significant distress to the patient whether or not symptoms are present. They are more common in women than in men. Majority seek medical advice for cosmetic reasons. A minority of patients complain of throbbing pain worse after prolonged standing and during menstrual period and relieved by elevation ***(Al Meida and Raines, 2009)***.

Their color vary between red and blue, the large deeper ones tend to be blue in color and the superficial smaller one tend to be red in color. They may occur at any site in the body but more in the face and lower limbs. The treatment of the ones located in lower limbs is more challenging than that of other sites as they are located deeper, usually larger in diameter and under more hydrostatic pressure ***(Parlar et al., 2014).***