

# Endovenous Laser Ablation for the Treatment of Venous Ulcers – A case report

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## INTRODUCTION

Venous ulcers are the most prevalent type of lower-extremity ulcers, accounting for more than two-thirds of all types of ulcers, which are more common with increasing age (Spentzouris & Labropoulos, 2009). In most cases, venous outflow obstruction or more commonly, reflux (usually incompetence of the valves) or a combination of the two, is evident (Neglen, 2007; Samuel et al, 2013). Malfunction in the foot and calf muscle pumps by itself could cause ulceration and it is most prevalent in patients with venous disease. All the causes listed above result in an increased ambulatory venous pressure, which is transmitted to the capillaries of the subcutaneous tissues and the skin, eventually leads, through a cascade of inflammatory events, to skin damage and ulcer development. Consequently, treatment of venous ulcers is hard due to the hostile environment formed (Spentzouris & Labropoulos, 2009; Samuel, 2009). The condition results in significant impairment of quality of life, and its treatment places a heavy financial burden on healthcare systems (Werdin et al, 2009). In fact, in the United States alone, an estimated \$5 billion to \$10 billion are spent each year in treatment of chronic wounds (Werdin et al, 2009).

There are many standard care solutions for non-healing cutaneous ulcers (Gottrup et al, 2010), specifically venous ulcers, including compression therapy with bandages or medical stockings. Although compression therapy enhances ulcer healing rates, it requires long-term use and patient adherence. Open surgery, which is unpopular, has been shown to reduce ulcer recurrence rates, but is only indicated for a small proportion of patients, requires general anesthesia, and puts patients at risk of age-related complications, and a prolonged and difficult recovery (Samuel, 2013). The efficacy of the newer, minimally-invasive endovenous

thermal techniques has been established in uncomplicated superficial venous disease (Darwood R J and Gough MJ, 2009; Min RJ and Khilnani NM, 2005). Endovenous Laser Ablation (EVLA) is now being increasingly used in the management of venous ulceration but with no randomized controlled trials on the effects on ulcer healing (Samuel, 2013). The following case report presents a hard-to-heal large leg venous ulcer that was fully cured following only one EVLA treatment.

## THE TECHNOLOGY

VascuLife™ is a system that combines a 1470nm diode laser with 360° radial fiber. A robotic pullback mechanism reduces procedure time and maximizes treatment efficiency (see Figure 1).



Figure 1. VascuLife System

## THE CASE

In June 2015, a 65-year-old female, arrived at the clinic with a large (16cm X 7cm) hard-to-heal venous leg ulcer. The patient has been treated by Dermatologists and Family

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doctors during the last 2 years. Figure 2 shows the ulcer as it looked the first day of treatment. It was covered with an unrecognized whitish ointment. The wound was cleansed and gently washed with saline.

**TREATMENT**

The laser fiber was inserted to the great saphenous vein, up to 2 cm distal to the saphenofemoral junction, via a catheter using ultrasound guidance and under local anesthesia. Standard tumescent anesthetic solution was administered to the patient. VascuLife™, equipped with a 600µm radial fiber, was set at 10W and the robotic pullback speed at 1 mm/min throughout the procedure.

Following treatment, the patient was asked to wear a medical compression stockings for 5 days, 24 hours a day, and then for 5 more days during daytime. The patient was then treated with hydrogel with dressing change every 48 hours until complete healing (Figure 5).



Figure 2. The ulcer in the first day, before treatment

**RESULTS**

No side effects were reported during or following the single EVLA treatment. The ulcer was completely healed by March 2016. The patient reported no other treatment

but conventional wound dressing (Granugel, ConvaTec UK). Figures 3 and 4 present the ulcer in between EVLA treatment and the healing. Note the reduced size of the affected ulcer following treatment.



Figure 3. Granulation tissue covers the ulcers. Epithelialization is seen in the wound edges. 45 days after treatment



Figure 4. More Epithelialization is seen. 6 months after treatment



Figure 5. Complete healing after 9 months

### DISCUSSION AND CONCLUSIONS

Presented here is a case of a large venous ulcer that had failed to heal over two years. Following EVLA treatment with VascuLife, a complete healing was achieved without adverse events and without skin grafting.

This case suggests that EVLA is a safe and effective tool for treating venous ulcers.

EVLA offers significant advantages including elimination of the need for surgical intervention, and reduced risk of complications. VascuLife™ employs a 1470nm laser, which targets interstitial water. Compared to other wavelengths that target hemoglobin, the 1470 nm laser dramatically lowers the risk of thrombosis and recanalization (Almeida et al, 2009).

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### REFERENCES

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