

### Facial Hypertrophic Port-Wine Stain Treatment Combining Large Spot 532 nm Laser, High-Intensity Focused Ultrasound and Traction Threads

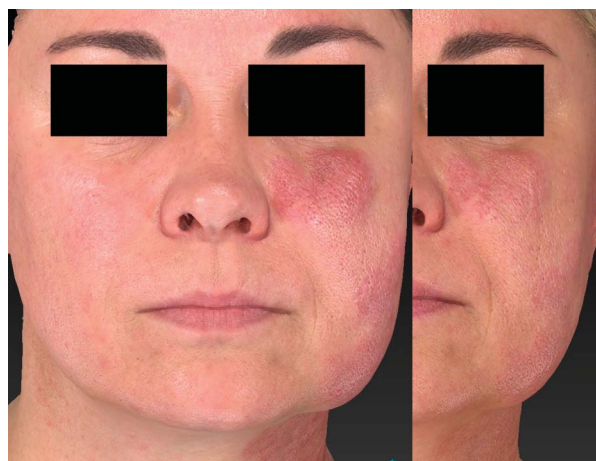
Vascular lasers are the gold standard treatment for treating facial capillary malformations commonly known as port-wine stains (PWSs). However, up to 65% of them are associated with significant soft tissue hypertrophy that cannot be satisfactorily addressed using vascular lasers.<sup>1</sup>

The authors report a 40-year-old Caucasian woman with a large PWS of the mid and lower face and neck. It was unilateral and associated with significant hypertrophy of the affected face that resulted in significant asymmetry. Both face and neck had been previously treated with several sessions of different vascular lasers: “small spot” potassium titanyl phosphate (532 nm) laser, intense pulsed light devices, and pulsed-dye laser (PDL). Pulsed-dye laser produced partial improvement of lesional color and was associated with minor scarring on her neck. Every previous treatment was stopped after several sessions when no further improvement was achievable.

The authors initiated treatment with large spot, short pulse 532 nm laser with contact cooling (ExcelV; Cutera, Inc., Brisbane, CA; fluence 9–10 J/cm<sup>2</sup>, pulse duration 6 milliseconds, 8-mm spot on the cheek and 7–9 J/cm<sup>2</sup>, 6–7 milliseconds, 9-mm spot on the neck) every 4 weeks for the vascular component of her PWS. After 6 sessions, the authors obtained 34.61% improvement in lesional color and area, measured with objective 3-dimensional digital photography as described previously.<sup>2</sup> To improve soft tissue hypertrophy and facial asymmetry, high-intensity focused ultrasound (HIFU) treatment was introduced (Ultraformer III; Classys, Inc., Seoul, Republic of Korea). The authors used 3 transducers working at the depths of 4.5, 3.0, and 1.5 mm, with energies 0.7, 0.6, and 0.4 J, respectively. A total of 600 lines were utilized in 2 sessions of 300 each with 2-week intervals. After 6 months, repositioning of hypertrophic cheek skin was performed with poly-L-lactic acid traction threads (Silhouette-Soft;

Sinclair Pharma Ltd., Chester, United Kingdom). The authors used 2 threads with 12 cones (6 on each side) in “V” shape fashion from 2 entry points in preauricular area and achieved immediate (data not shown) and delayed satisfactory results (Figure 1). The patient reported greater satisfaction from improved facial asymmetry than from color modification.

The authors’ previous reports documented that large spot, short pulse 532 nm laser is effective in the reduction of color and area of facial PWS in both previously treated and untreated patients. The degree of color and area improvement achievable in patients previously treated with PDL is lower than in those treated with other lasers only or not treated at all (37.3% vs 60.3% vs 70.4%, respectively).<sup>2,3</sup> The study patients improved 34.6% when color and area were objectively measured on both face and neck. Based on the authors’ experience, more than 10% of facial PWS will become hypertrophic, emphasizing a significant gap in the standard treatment regimen. The study patient illustrates the importance of correcting facial asymmetry.



**Figure 1.** Left jawline contour before (left) and 3 months after (right) treatment with large spot, short pulse 532 nm wavelength laser, HIFU, and absorbable poly-L-lactic acid traction threads. HIFU, high-intensity focused ultrasound.

High-intensity focused ultrasound, or microfocused ultrasound, is effective for skin tightening.<sup>4</sup> This method is based on stimulation of collagenesis by micro-heating of tissue induced by focused ultrasound in selected depths without destruction of surrounding tissue and overlying epidermis. Bruising can appear during the standard HIFU procedure performed for skin tightening in a minority of patients as a result of accidental small vessel damage. The study patient did not experience any side effects, including bruising related to HIFU, except moderate pain during the procedure.

Traction absorbable threads are being used more and more for skin repositioning in the treatment of wrinkles and facial contouring to reduce or prevent signs of aging. This treatment is regarded as safe; threads are absorbed within 6 to 12 months depending on the material used. After that time, skin repositioning can be maintained by the induction of collagenesis along the threads. A common side effect related to this procedure is bruising. The authors observed no excessive bleeding when they implemented traction threads and no bruising. The authors anesthetized not only the entry and exit points but also the skin along the threads with 2% lidocaine mixed with adrenaline to achieve vasoconstriction and reduce the risk of excessive bleeding that could have worsened the anchorage of threads in subdermal tissue. The authors found it more difficult to identify a superficial fat plane and guide the thread within the plane when compared to the standard procedure performed in healthy skin. This finding was probably related to dermal hypertrophy observed in PWS patients and due to skin remodeling caused by previous laser procedures. The lack of bruising after HIFU or excessive bleeding during threads implementation could have been related to vascular laser pretreatment that diminished vasculature of PWS. Laser treatment may penetrate deep to the subcutis when beam diameter and laser wavelength are appropriate.<sup>3</sup> To the best of our knowledge, this is the first case of HIFU usage in facial PWS. Threads were previously used for the treatment of facial asymmetry related to muscle paralysis.<sup>5</sup> The authors show that these methods can be useful for the treatment of asymmetry related to soft tissue hypertrophy in PWS. In the study patient, the benefit of threads and HIFU overwhelmed laser-related color fading of PWS. Both

HIFU and thread techniques should be further studied to fill the gap in the treatment of hypertrophic PWS.

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