

Angiokeratoma of the lower extremities: Successful treatment with a dual-wavelength laser system (595 and 1064 nm)

Editor

Angiokeratomas are rare vascular lesions with secondary verrucous epidermal changes. The exact pathogenesis is unknown, although genetic factors, pregnancy, chilblains, trauma and tissue asphyxia are known causal factors.

We report for the first time on the successful treatment of 'solitary and multiple papular' type angiokeratomas of the lower extremities with a synchronized dual wavelength laser system (Cynergy with Multiplex™, Cynosure, Westford, MA, USA).

A 45-year-old male patient presented with multiple red-bluish pretibial verrucous plaques (Fig. 1). The lesions had been present since 10 years with recurrent episodes of bleeding and had been unsuccessfully treated with surgery resulting in significant scarring. A biopsy specimen was consistent with a diagnosis of 'solitary and papular type' angiokeratoma.

The left side was treated with combined sequential application of 595-nm pulsed dye laser (PDL) and 1064-nm Nd:YAG wavelengths; the other received Nd:YAG treatment alone using the same parameters. Laser parameters were as follows: 10 J/cm², 10 ms, 10-mm spot size with PDL, followed by Nd:YAG at 50 to 60 J/cm², 15 ms with an interpulse delay of 500 ms. Treatments were repeated four times at 6-week intervals. Pulse overlap was avoided to minimize the risk of extensive thermal injury. Continuous air flow cooling was strictly adhered (Cryo5°, set at level 5, Zimmer Medizinsysteme GmbH, Neu-Ulm, Germany). At the end of the treatment course, we observed a more pronounced reduction of angiokeratomas on the side treated sequentially with the PDL and Nd:YAG wavelengths without further increase of pre-existing scars and other long-term side effects (Fig. 2).

Angiokeratomas present a therapeutical challenge. They are often too widespread to allow surgery or cautery without haemorrhage and scarring. Numerous institutions have reported on the more or less successful treatment with argon laser, copper vapour laser, variable pulse width 532-nm KTP-Nd:YAG laser and PDL.¹

In 2006, Lapidoth *et al.* treated 12 persons with 'angiokeratomas of Fordyce' with the PDL. Seven patients had an excellent response (clearance rate, 75–100%), and five patients had a good response (50–75%) with no permanent side effects.² Despite its

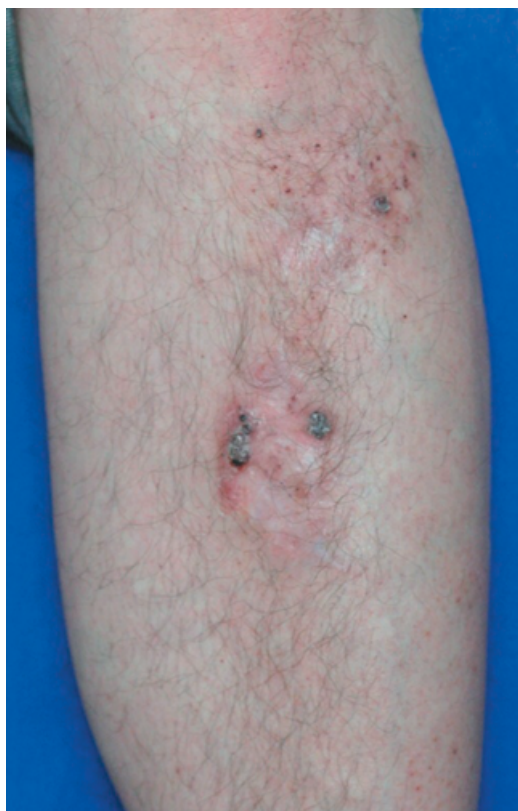


Figure 1 Angiokeratoma of the left leg before treatment.

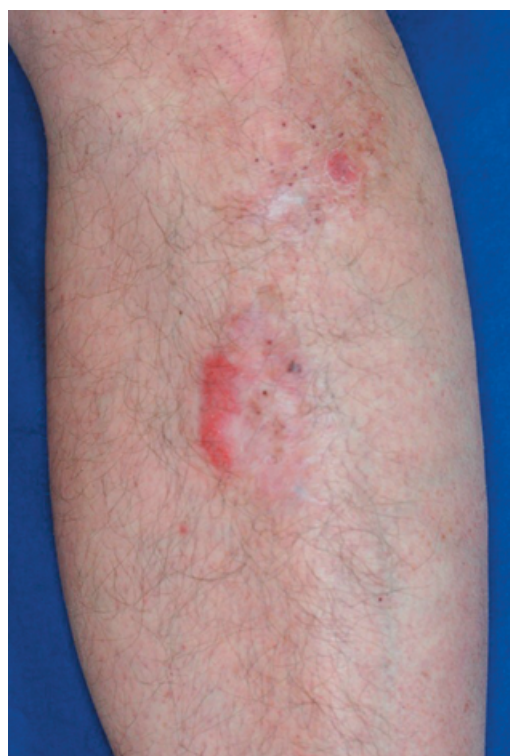


Figure 2 Angiokeratoma of the left leg after treatment with sequential combined application of 595-nm PDL and 1064-nm Nd:YAG. Minor lesions of psoriasis are visible.

excellent safety profile, PDL's effectiveness is limited by the penetration depth of max. 1.5 mm.

Sommer *et al.* reported on the successful treatment of an acral variant of angiokeratoma with a long-pulse 1064-nm Nd:YAG laser.³ This device was chosen because the lesions were hyperkeratotic and raised and the 1064-nm Nd:YAG laser has been reported to be of benefit in deeper vascular malformations and leg veins.⁴⁻⁶ They performed six treatment sessions with 30 J/cm², 50 ms and 2-mm spot size with good improvement (category not explained). Of note, the authors observed atrophic scarring and hyperpigmentation even with these low fluences. In general, optimal parameters for the treatment of veins range from 100 to 200 J/cm².⁷

In our patient, we observed excellent results after sequential application of 595-nm PDL and 1064-nm Nd:YAG laser with no significant side effects. One possible explanation for the synergistic effect is that compared with treatment with Nd:YAG laser alone, the sequential mode takes advantage of a chromic shift in blood when heated over 62 °C during the first irradiation with PDL.^{8,9} The preformed met-haemoglobin has a three times higher absorption capacity than oxyhaemoglobin around 1000 nm.¹⁰ Therefore, lower Nd:YAG fluences can effectively reduce the targeted vessels in combination with lower rates of side-effects.

In our observation, this is mirrored in a higher clearance rate with sequential application of two wavelengths compared with Nd:YAG laser treatment alone. This synergistic approach suggests being a superior treatment method for raised, blebbed vascular lesions.

G Pfirmann,[†] C Raulin,^{†‡} S Karsai^{*†}

[†]Laserklinik Karlsruhe, Karlsruhe, Germany, [‡]Department of Dermatology, University of Heidelberg, Heidelberg, Germany

^{*}Correspondence: S Karsai. E-mail: syruskarsai@aol.com

References

- Haedersdal M. Cutaneous side effects from laser treatment of the skin: skin cancer, scars, wounds, pigmentary changes, and purpura – use of pulsed dye laser, copper vapor laser, and argon laser. *Acta Derm Venereol Suppl* 1999; **207**: 1–32.
- Lapidoth M, Ad-El D, David M, Azaria R. Treatment of angiokeratoma of Fordyce with pulsed dye laser. *Dermatol Surg* 2006; **32**: 1147–1150.
- Ross EV, Domankevitz Y. Laser treatment of leg veins: physical mechanisms and theoretical considerations. *Lasers Surg Med* 2005; **36**: 105–116.
- Sommer S, Merchant WJ, Sheehan-Dare R. Severe predominantly acral variant of angiokeratoma of Mibelli: response to long-pulse Nd: YAG (1064 nm) laser treatment. *J Am Acad Dermatol* 2001; **45**: 764–766.
- Mordon S. [Transformation of hemoglobin into methemoglobin during heating of blood: its role in the treatment of vascular lesions using an Nd: YAG (1.06 m) laser treatment of vascular lesions]. *Ann Dermatol Venereol* 2003; **130**: 648–651.
- Mordon S, Brisot D, Fournier N. Using a 'non uniform pulse sequence' can improve selective coagulation with a Nd: YAG laser (1.06 microm) thanks to Met-hemoglobin absorption: a clinical study on blue leg veins. *Lasers Surg Med* 2003; **32**: 160–170.
- Bäumler W, Ulrich H, Hartl M, Landthaler M, Shafirstein G. Optimal parameters for the treatment of leg veins using Nd: YAG lasers at 1064nm. *Br J Dermatol* 2006; **155**: 364–371.
- Barton JK, Frangineas G, Pummer H, Black JF. Cooperative phenomena in two-pulse, two-color laser photocoagulation of cutaneous blood vessels. *Photochem Photobiol* 2001; **73**: 642–650.
- Randeberg LL, Bonesronning JH, Dalaker M, Nelson JS, Svaasand LO. Methemoglobin formation during laser induced photothermolysis of vascular skin lesions. *Lasers Surg Med* 2004; **34**: 414–419.
- Tanghetti E, Sherr EA, Sierra R, Mirkov M. The effects of pulse dye laser double-pass treatment intervals on depth of vessel coagulation. *Lasers Surg Med* 2006; **38**: 16–21.

DOI: 10.1111/j.1468-3083.2008.02763.x

Correlation of stressful events with onset of vitiligo in children

Editor

Vitiligo could have a very serious impact on children's life. Age, change of location or situation could represent a predictor of stress. But children developing other competencies that strengthen self-esteem could cope better with the disease.¹ In the area of paediatric psychodermatology, we have tried to observe the presence of stressful events before the onset/extension of vitiligo.

We have performed a case-control study between March 2001 and December 2006 in the dermatological department of Cetatea Histria Polyclinic in Bucharest where both children and adults are referred by the general practitioners in a large area of the city and surroundings (about 500 000 inhabitants). Controls had skin diseases with well-established aetiology, presumed to have low psychosomatic component. Thirty cases of vitiligo (16 girls and 14 boys) were counted in 6917 new dermatological cases in children (≤ 14 years old), with an incidence of 0.43% among dermatological diagnosis. Twenty-one children with onset not more than 9 months before the evaluation or with recent extensions were included. We have selected interviews with children and parents taking in consideration potential stressful situation, appearance during the year before the evaluation and excluding those occurred after the onset/exacerbation.

The situations were divided (after the collection of data) into the following: events related to school/kindergarten, family changes, personal illnesses/accidents/previous operations, psychotrauma. Odds ratios were calculated, and χ^2 and *t*-test was used in order to study the differences between the groups, considering a significant difference for $P \leq 0.05$.

There were 9 girls (42.85%) and 12 boys (57.15%). Mean age was 9.95 years (SD = 2.43). Most of children had recent onset (≤ 3 months; 47.63%) or recent extensions of old lesions (38.09%). Three vitiligo children had also Sutton naevi. Four boys and one girl had family history of the disease (23.8%). It is important to mention the potential vulnerability for boys: being the only child in the family (60%) and the presence of incomplete family model (separated/divorced parents; 20%).