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Cutaneous Collagenous Vasculopathy Treated With Pulsed Dye Laser: A Case Series and Literature Review

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ABSTRACT

Cutaneous collagenous vasculopathy (CCV) is an underreported cutaneous microangiopathy that primarily involves the lower extremities. Optimal treatment of CCV has not been well-defined, which may be in part due to the rare nature of the condition; however, a few case reports have demonstrated a reduction in the appearance of CCV-associated telangiectasias with vascular laser therapy. Here, we present 2 cases of CCV successfully treated with pulsed dye laser (PDL) therapy and summarize the existing literature on this topic.

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INTRODUCTION

Cutaneous collagenous vasculopathy (CCV) is a rare, idiopathic, cutaneous microangiopathy first reported in the early 2000s.[1] It presents as diffuse telangiectasias, initially appearing on the lower extremities, and sometimes spreading to the trunk and upper extremities without nail, mucosal, or systemic involvement.[4] Clinically, this differentiates CCV from a similar entity, generalized essential telangiectasia (GET), which presents with a more widespread distribution of telangiectasias, sometimes involving the conjunctiva and oral mucosa. GET is further differentiated from CCV based on histopathologic findings.[4] Effective treatment options for CCV are limited. Pulsed dye lasers (PDL) emit visible light at wavelengths of 585 nm and 595 nm and are shown to be safe and effective in the treatment of a variety of cutaneous vascular lesions via the principle of selective photothermolysis.[4] Herein, we report 2 cases of CCV successfully treated with PDL therapy and review the existing literature on this topic to suggest optimal laser settings for the treatment of CCV.

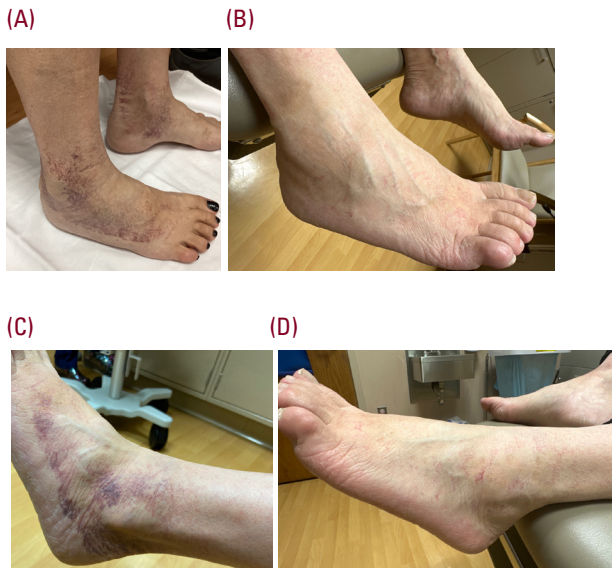
CASES

Case One

A 44-year-old woman with Fitzpatrick type II skin and a history of right peroneal deep vein thrombosis presented with a 14-year history of "spider veins" on her bilateral feet, ankles, and legs. She reported that the lesions developed during pregnancy and had worsened over the past several years. She was originally evaluated by vascular surgery. She did not have significant superficial or deep venous reflux. Sclerotherapy and laser therapy for the cosmetic treatment of spider veins were discussed. Given the location of lesions on the ankles and below, she was encouraged to explore laser therapy and was referred to dermatology.

Examination of the lower extremities revealed diffuse violaceous blanchable telangiectasias coalescing into patches along the lateral feet, lateral and medial malleoli, and posterior ankles (Figure 1A and 1C). A biopsy was not performed due to our high clinical suspicion of CCV and to preserve cosmesis. The patient elected to proceed with PDL treatment of the lesions.

FIGURE 1. (A, C) Violaceous telangiectasias along the ankles and feet and (B, D) near-total reduction of telangiectasias after two PDL treatment sessions.



The following laser parameters were used: 595 nm wavelength, 7–10 mm spot size at 8–8.25 J/cm^2, and a 1.5 msec pulse duration. She underwent 3 treatment sessions, spaced 4 and then 11 months apart. She experienced no major adverse events and, after the third session, noted a near-total reduction in the appearance of telangiectasias, aside from one residual telangiectasia on the right medial lower leg. The results of her treatment after two PDL sessions are displayed in Figures 1B and 1D.

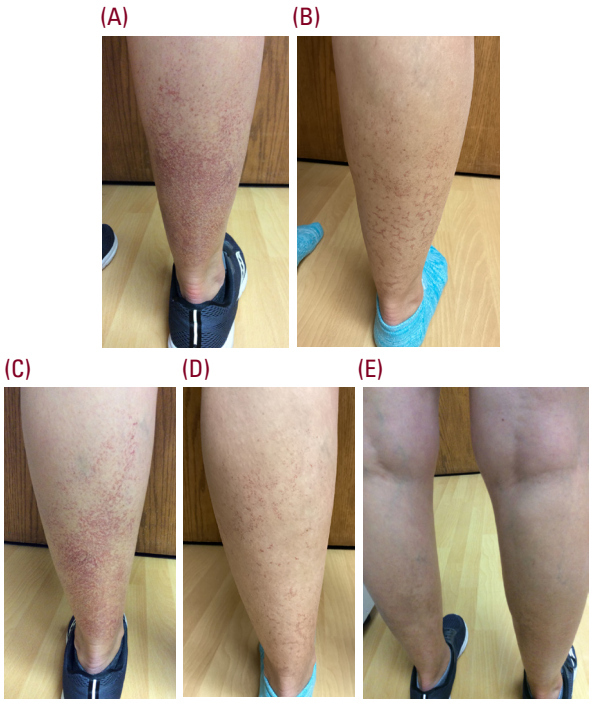
Case Two

A 60-year-old woman with Fitzpatrick type II skin presented for evaluation of numerous longstanding telangiectatic vessels on her lower legs.

Examination revealed dark red, blanchable telangiectasias of the distal lower extremities, which coalesced into broad, hypervascular patches, especially at the posterior surfaces (Figure 2A and 2C).

At her first treatment session, spot testing was completed on the left posterior distal leg with the following PDL settings: 595 nm wavelength, 7 mm spot size at 8 J/cm^2, 9.5 J/cm^2, and 11 J/cm^2, and a 1.5 msec pulse duration. Approximately 3 months later, she returned for follow up and was noted to have excellent reduction of telangiectasias in areas treated with 9.5 and 11 J/cm^2.

FIGURE 2. (A, C) Diffuse dark red telangiectasias on the posterior surface of the distal lower extremities and (B, D, E) significant reduction of telangiectasias after 2 PDL treatment sessions.



We elected to proceed with full treatments using the lowest fluence that resulted in vessel clearance. For patient comfort, treatments were divided between the anterior and posterior aspects of the distal lower extremities. The patient underwent 3 PDL treatments to the posterior lower legs with excellent improvement. She later underwent 3 total treatments to the anterior lower legs. Laser settings utilized were 595 nm wavelength, 7–10 mm spot size at 9.5–10 J/cm^2, and a 1.5 msec pulse duration. Her treatments were completed 2 to 5 months apart. She noted an approximately 90% reduction in the appearance of telangiectasias after the fourth visit and only mild focal post-treatment hyperpigmentation that resolved spontaneously within 3 months. The results of 2 PDL treatments to the posterior surface of her lower extremities are displayed in Figures 2B, 2D, and 2E.

DISCUSSION

Here, we presented 2 cases of CCV successfully treated with PDL therapy. The use of PDL treatment for cutaneous vascular lesions is based on the principle of selective photothermolysis, which suggests that certain wavelengths of light are absorbed by intravascular oxyhemoglobin. This energy is transferred to the surrounding vessel, thereby destroying it without harming adjacent structures.[4] PDL settings can be modified according to 4 parameters: wavelength, spot size, fluence, and pulse duration. Some larger vessels and deeper dermal structures can be targeted with larger spot sizes and higher fluences.

There is no standard treatment for CCV, which may be in part due to the rarity of the condition. However, PDL and other vascular laser treatments may be considered for cosmetic treatment of CCV and other telangiectatic conditions. We performed a literature search within PubMed and Scopus databases, leading to the identification of 5 case reports that discussed the successful treatment of CCV with PDL (Table 1).[2-6] All cases confirmed the diagnosis histologically. In most cases, the telangiectasias most prominently affected the lower legs. The most frequently utilized PDL parameters included a wavelength of 595 nm and fluence of 8 J/cm^2. Pulse duration ranged from 2–10 msec. The total number of treatment sessions ranged from 3 to 9.

This study adds to the preliminary literature suggesting that PDL is an effective treatment for CCV. Taken together, our case series and literature review indicate that the optimal settings to treat CCV in Fitzpatrick skin types I-II may be 595 nm wavelength, 7–10 mm spot size at 8–9.5 J/cm^2, and a 1.5 msec pulse duration; however, it is important to use an individualized approach depending on the patient's skin type, degree of vessel density, and location of target telangiectasias. With this therapeutic approach, excellent clinical improvement may be achieved. This study is limited by the lack of histologic confirmation of the diagnosis in these two cases, although the clinical findings were classic for CCV.

TABLE 1.

Successful Treatment Case Reports of Cutaneous Collagenous Vasculopathy With PDL

Article	Age (Years)	Sex	Race	Fitzpatrick Skin Type	Biopsy-proven CCV (Y/N)	Site	Optimal PDL Laser Settings	Number of Treatment Sessions	Degree of Clinical Improvement
Ahearn et al[2]	36	M	Caucasian	I-II	Y	Lower legs, thighs, and forearms	Wavelength: 595 nm Spot size: 7 mm Fluence: 8 J/cm^2 Pulse duration: 3 msec	9	Significant improvement after eight treatments with PDL
Basso et al[3]	77	F	Caucasian	Not reported	Y	Lower legs, thighs, arms, and chest	Wavelength: 595 nm* Spot size: 7 mm Fluence: 8.5 J/cm^2 Pulse duration: 10 msec *PDL treatment followed by Nd:YAG laser and Optimized Pulsed Light	7	Almost complete clearance of telangiectasia on the arms and chest
Echeverría et al[4]	42	F	Caucasian	Not reported	Y	Lower extremities, abdomen, and arms	Wavelength: 585 nm Spot size: 7 mm Fluence: 8 J/cm^2 Pulse duration: 2 msec	Not reported	Not reported
Firsowicz et al[5]	13	F	Caucasian	Not reported	Y	Upper extremities and left thigh	Wavelength: 595 nm Spot size: 7 mm Fluence: 8 J/cm^2 Pulse duration: 6 msec	3	Fading of the erythematous patches after the first and second treatments
Mitteldorf et al[6]	68	F	Caucasian	Not reported	Y	Legs, trunk, and arms	Wavelength: 595 nm Spot size: 7 mm Fluence: 14 J/cm^2 Pulse duration: 10 msec	4	Not reported

DISCLOSURES

The authors have no conflicts of interest to declare.

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