

ORIGINAL CONTRIBUTION

Evaluation of the efficacy of pro-yellow laser in the management of vascular skin disorders

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Abstract

Background: Lasers have great importance in the management of vascular skin lesions.

Aim: To determine the efficacy of 577-nm pro-yellow laser in cure of certain vascular skin diseases.

Material and methods: Seventy-four patients who are diagnosed as vascular skin diseases were involved in this study. All participants were treated with 577-nm pro-yellow laser with 4-week intervals. The photographs that were taken before and at every following visit were used to evaluate improvement.

Results: A significant improvement occurred in port-wine stain, rosacea, facial telangiectasia, venous lake, scrotal angiokeratoma, and cherry angioma cases.

Conclusion: Vascular skin lesions can be treated with 577-nm pro-yellow laser with a minimal adverse effect and great success rate.

KEYWORDS

port-wine stain, pro-yellow laser, rosacea, telangiectasia, venous lake

1 | INTRODUCTION

Vascular skin lesions, which are characterized by defect in blood vessels, occur due to the disorders of vascular development.¹ While this condition can occur in the whole body, 60% of them are located in the head and neck regions.² Among these vascular lesions, facial telangiectasia, erythematotelangiectatic rosacea, port-wine stains, venous lake, spider angioma, and cherry angiomas can be counted.

Laser is one of the most common options, which can be used in the management of vascular lesions. It targets intravascular oxy-hemoglobin to destruct various vascular lesions. There are several types of lasers used in the treatment of vascular lesions, such as argon (488–514 nm), copper vapor (578 nm), pulsed dye (585–595 nm), and Nd:YAG laser (532–1064 nm).³

A 577-nm pro-yellow laser, which has been used to treat diabetic retinopathy for 20 years, has an ideal wavelength for treating vascular skin disorders.⁴

There are a limited number of studies in the literature evaluating the efficacy of pro-yellow laser on vascular skin lesions. Therefore, we aimed to determine the effectiveness of 577-nm pro-yellow laser

on vascular skin lesions as port-wine stain, facial telangiectasia, and erythematotelangiectatic rosacea.

2 | MATERIALS AND METHODS

This study was administered retrospectively. A total of 74 patients who admitted to our dermatology clinic and treated with the pro-yellow laser were retrospectively evaluated. The diagnosis was made based on clinical examination and detailed histories. No biopsy was performed for the diagnosis. Informed consent forms were obtained from all participants, and the study was executed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

2.1 | Application of laser

Topical anesthesia with 5% lidocaine cream was applied in the area where laser planned 30 minutes before the treatment. After

	PWS (n = 6)	ETR (n = 13)	FT (n = 37)	VL (n = 6)	SA (n = 6)	CA (n = 4)	SAk (n = 2)
Number of sessions (Mean)	3,33	2,23	1,83	1,5	1,16	1	2

TABLE 1 Number of sessions according to diagnoses

Abbreviations: CA, cherry angioma; ETR, erythematotelangiectatic rosacea; FT, facial telangiectasia; PWS, port-wine stain; SA, spider angioma; Sak, scrotal angiokeratoma; VL, venous lake.

providing antiseptis, pro-yellow laser was applied. One to four sessions of pro-yellow laser were applied to all patients with 4-week intervals (Table 1). All of the patients were treated with 577-nm pro-yellow laser (QuadroStar PRO YELLOW Asclepion Laser Technologies, Germany) with a fluence of 18 J/cm² in the basic mode of the device. Cold application was performed after the sessions, and the patients were recommended to use sunscreen regularly.

2.2 | Patients' evaluation

The assessment of the treatment was based on clinical examination and digital photographs at baseline and four weeks after the last session. Improvement was rated as excellent(75%–100%), very good (50%–74%), good (25%–49%), and poor (<25%). Also, the occurrence of any adverse effects during or after the session was noted.

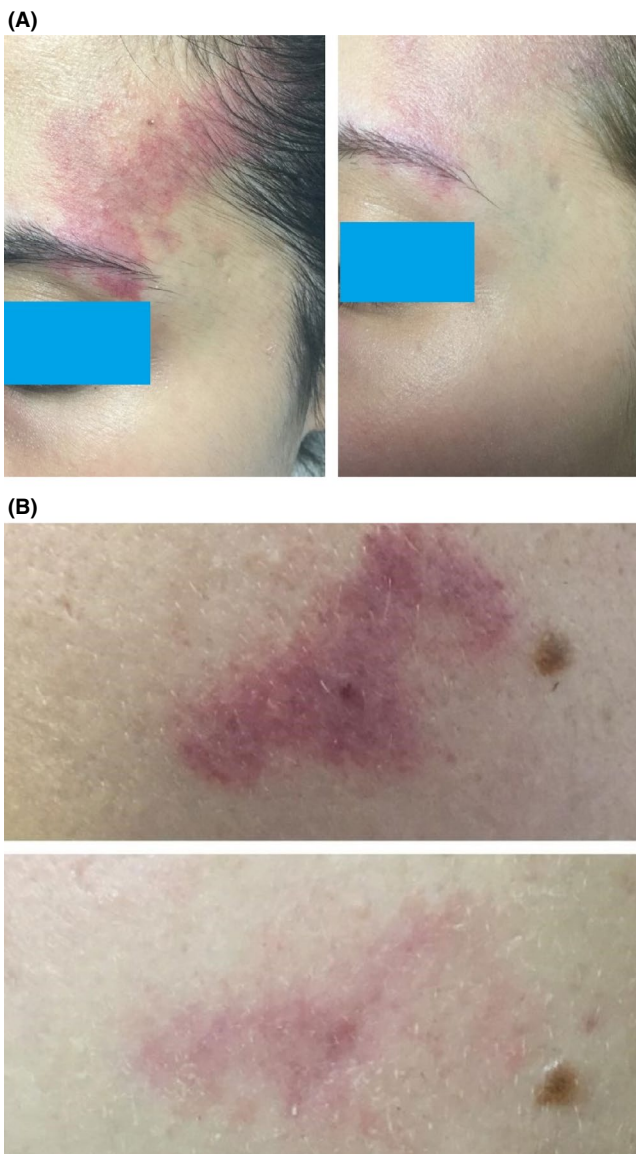


FIGURE 1 Patient with port-wine stain and recovery after four sessions



FIGURE 2 Patient with facial telangiectasia and recovery after three sessions

2.3 | Statistical evaluation

The SPSS for Windows version 25.0 software was used for the statistical evaluation of the study data. Mean (X) \pm standard deviation (SD) was utilized for the data regarding quantitative variables and number (n) and percentage (%) for qualitative data. Statistical evaluation of the data was conducted with the Pearson chi-square test and Fisher's exact chi-square test. p value <0.05 was accepted as statistically significant.

3 | RESULTS

A total of 74 patients were included in the study. 53 patients (71.6%) were female, and 21 patients (28.4%) were male with the mean age of 40.97 ± 7.77 (ranged between 28 and 63 years). 34 of the patients

had Fitzpatrick type 2 (45.9%), and 40 patients had Fitzpatrick type 3 (54.1%) skin type.

The diagnosis was facial telangiectasia in 37 patients, erythema-toteliangiectatic rosacea in 13, port-wine stain in 6, spider angioma in 6, venous lake in 6, cherry angioma in 4, and scrotal angiokeratoma in 2 patients. There were excellent improvement in 1 case in patients with port-wine stain (16.7%) and very good improvement in 6 (83.3%) cases (Figure 1). In patients with facial telangiectasia, there were

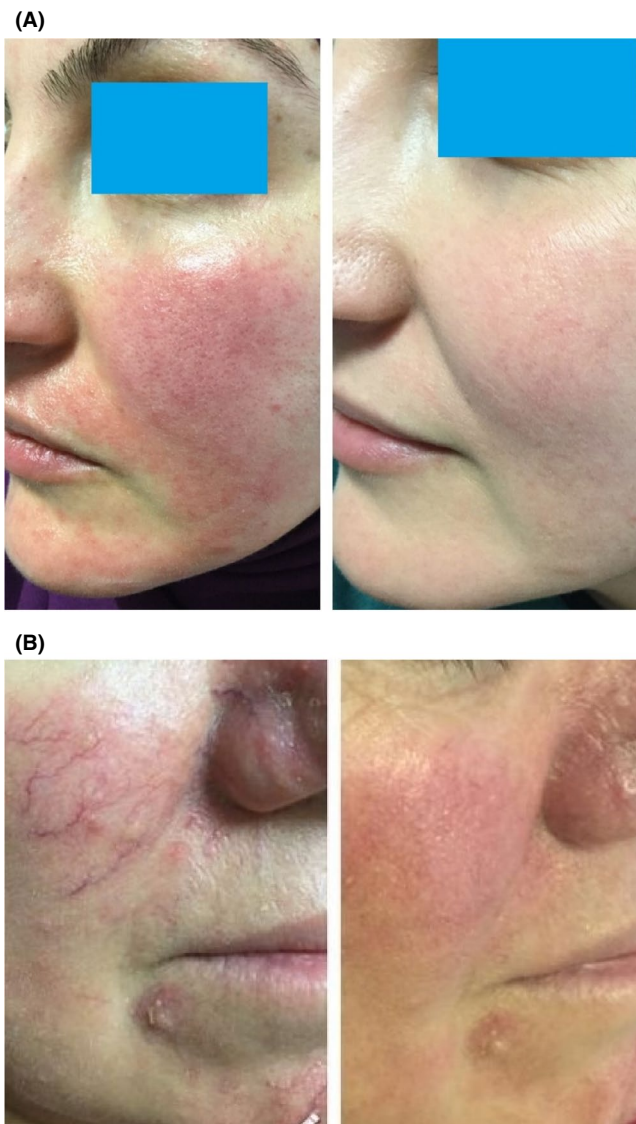


FIGURE 3 Patient with rosacea and recovery after three sessions



FIGURE 4 Patient with venous lake and recovery after one session (hearing the "plop" sound during the procedure is the correct sign)



FIGURE 5 Patient with spider angioma and recovery after one session



FIGURE 6 Patient with scrotal angiokeratoma and recovery after two sessions

excellent improvement in 26 (70.3%) cases and very good improvement in 11 (29.7%) cases (Figure 2). In rosacea patients, there were excellent improvement in 6 (46.2%) cases, very good improvement in 6 (46.2%) cases, and good improvement in 1 (7.6%) case (Figure 3). In patients with venous lake, there were excellent improvement in 3 (50%) cases and very good improvement in 3 (50%) cases (Figure 4). In patients with cherry angioma, spider angioma, and scrotal angiokeratoma, excellent improvement was seen in all cases (Figures 5,6). Transient erythema after the session disappeared within 24–48 h was the only complication recorded. No significant relationship was seen between the improvement of lesions after the treatment and patient's ages, sex, and skin phototypes ($p>0.05$).

4 | DISCUSSION

Pro-yellow laser is 577-nm yellow light laser of which wavelength is ideal for treating vascular lesions. Pro-yellow laser has been used to treat superficial vascular lesions, telangiectasias, couperose skin, spider angiomas, port-wine stains, spider veins, warts, sebaceous gland hyperplasia, lentiginos, and pigmented lesions. The copper bromide laser is a laser that contains two wavelengths as yellow and green light. Its wavelength is closest to the pro-yellow laser. This type of laser carries risk of postinflammatory hyperpigmentation due to containing two wavelengths as yellow and green, whereas the pure yellow light in pro-yellow laser allows it to use in the management of vascular lesions in individuals with dark skin.^{5,6}

Telangiectasia is a vascular skin lesion, which can occur in various shapes and sizes. There are many etiological factors that cause telangiectasia such as topical corticosteroids, rosacea, sun

exposure, and connective tissue diseases.⁷ Because of the physical and psychological effects on people, the treatment of this condition has great importance.⁸ The main chromophore is hemoglobin in erythema and telangiectasia. There are several laser types such as pulsed dye lasers, Argon laser, and Krypton lasers.⁹ But many side effects such as hypopigmentation, pitted-depressed scars, postinflammatory hyperpigmentation, bullae, and crusts can be seen after the use of these lasers.¹⁰ On the contrary, pro-yellow laser presents a minimal risk for hyperpigmentation and scar formation.⁶ This procedure was used by Kapicioglu et al for treating facial erythema, erythematotelangiectatic rosacea, port-wine stains, and facial telangiectasia, and in these studies, they suggested that it is effective and reliable.^{6,11} Also, Mohamed et al. used this laser to treat facial vascular lesions and suggested that only a few sessions are sufficient for effective results in facial erythema, whereas port-wine stains require longer sessions. They considered this laser safe in the treatment of vascular lesions successfully.¹² In our study, we used this laser for the treatment of several vascular lesions. We found high success rates with a small number of sessions in the treatment of facial telangiectasia, erythematotelangiectatic rosacea, and port-wine stains in accordance with the literature. We also had great success rates when treating other vascular skin lesions included in venous lake, cherry angioma, and scrotal angiokeratoma with no side effects such as hyperpigmentation, bullae, and scar formation that are seen after the application of other laser systems. This is the first report in the literature on the use of the pro-yellow laser for the treatment of venous lake, cherry angioma, and scrotal angiokeratoma. Mild erythema that faded away in 12–24 h after the session was the only side effect seen after pro-yellow laser treatment.

In the treatment of vascular skin lesions, several types of laser have been used. Some of them require additional materials, for example, dye in pulsed dye laser or gel and cooling equipment in IPL laser. But pro-yellow laser does not require additional equipment as an advantage.⁶

The limitations of this study are as follows: Patients younger than 5 years were not included in the pediatric age group, and also, severe forms of vascular problems are not taken into account.

In conclusion, we suggest that pro-yellow laser is a good alternative in the treatment of vascular skin lesions. If you see mild or moderate skin vascular concerns and are looking for a quick solution for treatment, pro-yellow laser is a good choice with short downtime. Our findings are similar to the literature. We have just wanted to emphasize although there are many types of laser systems, pro-yellow laser provides efficient results without side effects such as edema, petechia, and purpura. Patients' satisfaction rate is high. The pro-yellow device is small, compact, and user-friendly, and has integrated cooling system, these features make it practical for daily use in dermatology clinics.

CONFLICT OF INTEREST

No conflict of interest.

Ethical approval was waived by the local Ethics Committee of University in view of the retrospective nature of the study and all the procedures being performed were part of the routine care.

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