Anatomical Evaluation for Successful Dye Laser Treatment of Port Wine Stain in Vietnamese Patients

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Abstract

AIM: To assess the efficacy in the treatment of port wine stain in the head and neck by using (Vbeam perfecta®).

METHODS: Forty-two port wine stain patients were recruited at the National Hospital of Dermatology and Venereology, Hanoi, Vietnam.

RESULTS: We reported an excellent response (43.8%) (76%-100% lightening), a good response (18.8%) (51%-75% lightening), fair improvement (18.8%) (26%-50% lightening), and no response (18.8%) (0%-25% lightening).

CONCLUSION: In conclusion, pulsed dye laser is an excellent technique to remove port wine stains on the face and neck.

Introduction

Port wine stain (PWS) is also called capillary malformation or nevus flammeus. PWS occurs in 0.1 – 0.2% of newborns in the world, but there are no reports about the frequency in the Vietnamese population. PWS appears at birth as a pale pink to red well-defined patches and grows in size commensurate with patient’s growth. They are typically seen in the head and neck area although they can occur anywhere on the skin and mucous membrane. If not treated, the disease can be disfigured in adults, with papular nodules on the PWS surface. As the patient aged, the color changes from pink to red to purple from childhood to adulthood, and this appears to be correlated with the wider vessel in older patients.

Pulsed dye laser (PDL) is considered one of the possible therapeutic choices for the treatment of vascular malformations and PWS [1].

Material and Methods

In this study, we access the utility of using pulsed dye laser (Vbeam perfecta®) in the treatment of forty-two Vietnamese patients with congenital PWS...
at the National Hospital of Dermatology & Venereology, from 2011 to 2014.

Every patient had 4 test patches with different fluences (11; 11.5; 12; and 12.5 J/cm²), but the same pulse duration (1.5 mms) and spot size (7 mm). After 8 weeks, the test area showed the best response was used as the set up for the next treatment. The results were evaluated by comparing pre and post photographs taken before and after each treatment using the Physician Global Assessment.

Results

Patients older than 18 years old achieved a better outcome than less than 18-year-old patients (30% vs 18.2%, respectively) as shown in Table 1.

Table 1: Correlation between results with age and some lesion’s manifestations

| Features | Respond rate | No. respond rate | p    |
|----------|--------------|------------------|------|
| Age      |              |                  |      |
| ≤ 18 years old | 70.0% | 30.0% | 0.369 |
| > 18 years old | 81.8% | 18.2% |          |
| Color    |              |                  |      |
| Purple   | 91.7%        | 8.3%             | 0.018|
| Red      | 87.5%        | 12.5%            |      |
| Pink     | 50.0%        | 50.0%            |      |
| Size     |              |                  |      |
| < 20 cm² | 75.0%        | 25.0%            | 0.560|
| ≥ 20 cm² | 78.6%        | 21.4%            |      |
| Surface  |              |                  |      |
| Flat     | 69.7%        | 30.3%            | 0.058|
| Elevated | 100%         | 0%               |      |

Regarding the lesion size, there was no statistical difference between lesions with greater or smaller 20 cm², p > 0.005 (as shown in Table 1).

In our study, patients having purple or red plaques showed greater improvement than pink plaques (91.7% and 87.5% response rate compared to 50%, respectively) as presented in Table1.

Figure 1: PWS under the chin

Figure 2: After 3 times treatment by using Vbeam perfecta

All patients had elevated surface (hypertrophic) lesions respond to treatment, while only 69.7% of patients with flat surface lesion responded to treatment, as presented in Table 1. However, this difference is not different statistically, but we would need a larger sample size to confirm this conclusion.

Figure 3: PWS on the cheek, and neck

Figure 4: After 10 times treatment
We also analysed the anatomical distribution of the lesion and found that perioral regions including the lips had the highest rate of failure (Table 2).

| Results/Distribution | Respond Patients | Percentage (%) | No respond Patients | Percentage (%) | Total |
|----------------------|------------------|----------------|---------------------|----------------|-------|
| Cheeks               | 24               | 72.7           | 9                   | 27.3           | 33    |
| Perioral             | 8                | 61.5           | 5                   | 38.5           | 13    |
| Periorbital          | 4                | 80             | 1                   | 20             | 5     |
| Chin                 | 3                | 100            | 0                   | 0              | 3     |
| Forehead             | 2                | 100            | 0                   | 0              | 2     |
| Nose                 | 1                | 100            | 0                   | 0              | 1     |
| Ears                 | 1                | 100            | 0                   | 0              | 1     |

**Discussion**

Our study did not support the theory that PWS should be treated as soon as possible, to avoid developing hypertrophic and nodular lesions at middle age [2], [3]. The reason explains why PWS on the neck is improving better than lip and cheek skin, by Richard et al., [4].

Red or purple PWS has superficial location whereas pink PWS, due to the small vessel size and deeper location, predict a poor response [4], [5]. Our study was in support of this theory.

The side effects as hyperpigmentation, hypopigmentation, blistering and crusting were not severe and improved with times, in according to other studies in the literature [6], [7], [8].

In conclusion, this is the first report of the utility of the 595 nm pulsed dye laser (Vbeam perfecta®) for PWS in Vietnamese patients, confirming the efficacy in treatment without considerable side effects.

**References**

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