

The Use of Pulsed Dye Laser for the Treatment of Xanthelasma Palpebrum

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Xanthelasma palpebrum is the most common type of xanthoma that develops mainly on the inner epicanthus of upper eyelids with symmetrical distribution. The lesion tends to be permanent, progressive and cosmetically disfiguring.

The recommended treatment has been surgical excision, local treatment with chemicals, and carbon dioxide laser. All of the mentioned treatment have some disadvantages including scarring, pigmentary change and need for local anesthesia.

We describe the treatment of xanthelasma palpebrum with the pulsed dye laser which coagulates the hyperpermeable vessels so that the lipid leakage could be blocked and prevent recurrence and further progression. (*Ann Dermatol* 13(1) 55~58, 2001).

Key Words : Xanthelasma palpebrum, Pulsed dye laser, Hyperpermeable vessel

Xanthelasma palpebrum or xanthelasmata is the most common type of xanthoma that occurs mainly on the eyelids. They are usually yellowish plaque-like lesions that develop most commonly near the inner epicanthus. They can be soft or semi-solid with frequent symmetrical distribution. They tend to be permanent, progressive, multiple and extremely disfiguring. Xanthelasma can develop from early childhood until late adulthood with higher prevalence in females¹⁻³. The exact pathogenesis is not yet clear.

The treatment recommended has been surgical excision¹, local treatment with trichloroacetic acid⁶ or Carbon Dioxide laser vaporization⁹. All of the mentioned methods have disadvantages, including the risk of scarring, pigmentary change, hematoma formation, and chemical irritation to

conjunctiva and the need for local anesthesia.^{1,8,9}

We describe the treatment of xanthelasma palpebrum with the Pulsed Dye Laser, which led us with great satisfaction and to our patients.

CASE

5 patients (3 male, 2 female) with xanthelasma palpebrum visited our department. Their ages were from 43 to 65. The patients all had symmetrical yellowish disfiguring plaques on the inner epicanthus of their upper eyelids. Three of the patients were investigated for lipid profiles and other possible abnormalities. The results showed normolipidemias with no other clinical manifestation of a systemic disease. The utilized device was a flash-lamp-pumped dye laser (SPTL-1, Candela laser corp, Boston, USA). The wavelength was set to 585 nm, and the spot size was 3mm. The initial energy dose was 7.0J/cm² for male and 6.5J/cm² for female, and it was increased to 0.25J/cm² per each session ranging from 7.0- 7.75 J/cm². The laser treatment was performed for 2 to 6 sessions, were carried out every 2 weeks (table 1).

The lesions had completely disappeared in 3 patients and in 2 patients had reduced in size. Most of the patients had developed periorbital swelling

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just after treatment. The patients had not complained about any pain or discomfort during the procedure.

DISCUSSION

Xanthelasma palpebrum is the commonest of the cutaneous xanthomas, they are least specific because they occur frequently in person with normal lipoprotein levels. It is estimated that about 50% of person with xanthelasma have normal lipid level^{1,4,6,7}. Histologically, xanthelasma resemble other types of xanthomas that are associated with hypercholesterolemia. They are composed of foamy histiocytes with frequent Touton giant cells. They differ from other xanthomas by the superficial location of the foamy cells near capillaries and the nearly

complete absence of fibrosis^{5,7}.

The pathogenesis of xanthelasma is still unclear. The accumulated cholesterol in hypercholesterolemic xanthoma is thought to originate from the blood. It is likely that a major portion of this cholesterol is derived from LDL that enters the xanthoma through the capillary walls^{3,6,7,11}. However xanthelasmas do develop in normocholesterolemic patients, which suggest other factors may play a role in the pathogenesis of the xanthelasma. The localization of xanthelasma to the eyelids suggests that local factor may also contribute to the pathogenesis. Normocholesterolemic xanthomas can develop in cutaneous sites of trauma, inflammation, and infection^{7,10-12}. It has been suggested that trauma and infection may alter vascular permeability so that lipoproteins enter the dermis and

Table 1. Brief summary of the cases

	Sex/Age	Lab	Initial dosage(J/cm ²)	Maintenance dosage(J/cm ²)	Treatment sessions
Case 1	M/51	WNL	7.5	7.5	3
Case 2	M/62	Not done	7.0	7.5	2
Case 3	F/48	Not done	6.5	7.0-7.5	4
Case 4	F/67	WNL	6.5	7.0-7.75	6
Case 5	M/41	WNL	7.5	7.5	2

Fig. 1. Xanthelasma palpebrum on both upper eyelids of 51-year-old male patient (before treatment).

Fig. 2. After treating with the pulsed dye laser, the lesion has completely disappeared.(3 sessions).

are continuously phagocytosed by the dermal cells. Scott¹¹ et al had experimented that in normocholesterlemics, the LDL has a slow rate of capillary leakage. But when local heat is applied, the LDL leakage rate increases dramatically, which suggests that capillary leakage of LDL is much higher in the areas that have been exposed to constant physical movement and friction where the heat is produced constantly. The eyelids are the areas where it is exposed to constant movement and friction and this might be the reason why xanthelasmas occur in these areas.

Various treatment methods have been recommended. The classical method is the surgical excision. This method is in risk of scarring when the recurrent xanthelasmas are treated. The scars may lead to ectropion and facial asymmetry. The lesion may bleed subsequently to form hematoma and anesthesia is always a necessity¹. Another method for treating xanthelasm is by using chemical trichloroacetic acid. It has not proven to be satisfactory due to the high risk of injuring conjunctiva⁸. Laser treatment of xanthelasma is the most favorable method at the present and Carbon Dioxide laser is the most preferable one. Carbon Dioxide laser vaporizes the tissue layer by layer, which allows the operator to perform to the precise level of lesion. However, there is a minimal risk of scarring if the lesion is too deep⁹.

The exact mechanism of pulsed dye laser in treating xanthelasma is not fully understood. It is presumed that by coagulating the pathologically hyperpermeable vessels which may block the leakage of lipids into the tissue and therefore prevent recurrent lesions¹².

After the treatment of xanthelasma with the pulsed dye laser, the treated areas show dark brownish to violaceous color which is originated from the intracutaneous hematoma and last for about 7 to 10 days. Some crusts form but slough after 5 to 6 days. After 2 weeks of treatment, the lesions have decreased in size. The size of the lesion reduces whenever the treatment is performed. After performing laser treatment for 3 to 6 sessions, the lesion had completely disappeared without any scarring or pigmentary change. According to Schonermark's paper¹³, he also successfully treated 3 patients with xanthelasma using pulsed dye laser.

This is probably a good method for DM patients who have difficulties in healing and need special

care for their wounds. The biopsy specimens of pre- and post-treatment were not obtained. Histopathologically, it is not for sure whether the lesions have disappeared completely or not. And the lipids remaining in the tissue, will gradually absorbed by the macrophages and the lesion would soon be cleared. But the result of the treatment has given the patient with great satisfaction. During the procedure, patient should wear protective eye shields since the eyeball is in close contact. The problem with the pulsed dye laser is that patients complain about swelling of their eyelids. This could be prevented by applying ice or cold water. The follow up period is rather short but the patients who were treated with the pulsed dye laser showed no sign of recurrence. Compared with other lasers the pulsed dye laser is a non-invasive, less painful method that does not require any anesthesia or postoperative care. The only disadvantage in treating xanthelasma is that the patient has to visit several more times to gain maximal results.

CONCLUSION

We suggest that the pulsed dye laser is another good alternative method which is safe, less painful in treating xanthelasma palpebrum, and at the same time can minimize the risk of bleeding, scarring, and disappointing cosmetic results.

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