

# Treatment of xanthelasma palpebrarum with a 1064-nm, Q-switched Nd:YAG laser

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**Background:** Xanthelasma palpebrarum is the most common cutaneous xanthoma characterized by soft, yellow papules or plaques that arise on the periorbital skin. As these lesions can be cosmetically disfiguring, many patients seek medical help to remove these lesions.

**Objective:** To determine the effectiveness and minimum number of treatment sessions with a 1064-nm, Q-switched neodymium-doped yttrium aluminum garnet (Nd:YAG) laser for the treatment of xanthelasma.

**Methods:** A retrospective review of patients with xanthelasma consecutively treated with Q-switched Nd:YAG laser was conducted. Forty-six patients with 103 lesions were identified from January 2012 through August 2015. Photographs taken of patients immediately before treatment and 4-8 weeks after treatment were independently evaluated by 2 dermatologists.

**Results:** After a single treatment session, 93.2% of lesions had some degree of clearance. All lesions had excellent-to-complete clearance after at least 4 treatment sessions. Patients usually required 4 treatment sessions for optimal results.

**Limitations:** This was a retrospective study. Treatment parameters varied, follow-up periods were not uniform, and response was not assessed with a validated scale.

**Conclusion:** The Q-switched Nd:YAG laser is effective and well tolerated in the treatment of xanthelasma in our study population. (J Am Acad Dermatol <http://dx.doi.org/10.1016/j.jaad.2017.03.041>.)

**Key words:** eyelids; hypercholesterolaemia; laser treatment; photoacoustic effect; Q-switched Nd:YAG; xanthelasma palpebrarum.

Xanthelasma palpebrarum is characterized by yellowish plaques over the periorbital region, composed of foamy lipid-laden histiocytes primarily within the upper reticular dermis on histologic examination. Patients are usually screened for hyperlipidemia, although this condition is associated with an underlying lipid disorder in only about half of these patients. The reported incidence of xanthelasma ranges from 0.56% to 1.5%.<sup>1-3</sup> Women are more commonly affected, and the peak incidence is in the 4th to 5th

#### Abbreviations used:

CO <sub>2</sub> :	carbon dioxide
Nd:YAG:	neodymium-doped yttrium aluminum garnet

decade of life.<sup>4</sup> This disorder can cause a lack of self-esteem and confidence, and effective treatment has been reported to improve quality of life.<sup>5</sup> Because of their conspicuous appearance, many patients seek cosmetic removal of these lesions.

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Myriad treatment modalities have been described for xanthelasma removal. Surgical excision is widely used at National Skin Centre, Singapore with good cosmetic outcome and patient acceptance. However, in situations when the lesions are extensive or encroach too close to the palpebrae, there is a risk for ectropion, medial canthal tenting, and poor cosmetic outcome. Ablative lasers, like carbon dioxide (CO<sub>2</sub>) laser<sup>6-9</sup> and erbium:yttrium aluminum garnet (YAG) laser,<sup>10</sup> are therapeutic options but risks of scarring and postinflammatory pigmentary changes have to be considered.

Treatment of xanthelasma with nonablative lasers has also been described. The use of Q-switched neodymium-doped (Nd):YAG laser for the treatment of xanthelasma, first described by Fusade,<sup>11</sup> showed good-to-excellent results in 8 out of 11 patients after a single session with a 1064-nm, Q-switched Nd:YAG laser. Another study by Marini<sup>12</sup> showed good-to-excellent response in 20 lesions after a single session with a 1064-nm, Q-switched Nd:YAG laser. Zhao et al<sup>13</sup> studied a total of 65 lesions and reported effectiveness with an increasing number of sessions, but did not define the number of sessions required. Conversely, Karsai et al<sup>14</sup> showed disappointing results with Nd:YAG laser both at the 1064-nm and frequency-doubled 532-nm mode; Karsai treated 37 patients with only 2 sessions, and the majority of treated lesions showed no clearance.

None of the previous studies have evaluated the number of treatments required for effective clearance (Table 1).<sup>11-15</sup> This study aimed to determine the average number of treatments required for successful clearance of xanthelasma palpebrarum.

## METHODS

A retrospective review of the National Skin Centre, Singapore database from January 2012 through August 2015 was performed. The study was approved by the National Healthcare Group Domain Specific Review Board. We included all patients with Asian skin type that had xanthelasma treated with the Q-switched Nd:YAG laser. Forty-six patients with 103 lesions were analyzed. Standardized digital photographs taken immediately preprocedure and 4-8 weeks postprocedure were

independently evaluated by 2 dermatologists. All photographs were taken by the same photographer using the same camera (Nikon D7100, Nikon Inc, Tokyo, Japan) and settings at fixed distance and fixed angles between camera and patients' faces.

A final assessment score was determined from the mean of their individual assessments. Treatment

efficacy was evaluated on a 6-point scale: 0 for no improvement, 1 for minimal (1%-25% clearance), 2 for fair (26%-50%), 3 for good (51%-75% clearance), 4 for excellent (76%-99% clearance), and 5 for complete clearance (100% clearance). Adverse events such as hyperpigmentation, hypopigmentation, texture changes, scarring, and ectropion were assessed at each follow-up visit, and these records were analyzed. In addition, patient medical records were reviewed to check if they had

been previously diagnosed with hyperlipidemia and if they were taking lipid-lowering medication. Hyperlipidemia in our study denotes abnormally elevated low-density lipoprotein levels (>4.0 mmol/L) or elevated total cholesterol levels (>6.1 mmol/L).

## Laser therapy

All patients received topical anesthesia EMLA cream (lidocaine 2.5% and prilocaine 2.5%) (AstraZeneca AB, Södertälje, Sweden) 1 hour before the procedure. Some patients had additional local infiltration with 1% lignocaine and adrenaline. Forced air-cooling (Cryo 6, Zimmer, MedizinSystems, Irvine, CA, USA) provided further anesthesia for all patients. Tetracaine hydrochloride 1% eye drops (Minims, Bausch & Lomb UK Limited, Surrey, UK) were applied to anesthetize the cornea and intraocular metal corneal shields (Cox II, Oculo-Plastik, Inc, Montreal, Canada) coated with tetracycline eye ointment were used for all patients.

The 1064-nm, Q-switched Nd:YAG laser (Revlite, Conbio, Fremont, CA, USA) with a 5-ns pulse width was used. The median starting fluence was 10 J/cm<sup>2</sup> and ranged from 7-10 J/cm<sup>2</sup>. A 3-mm or 4-mm spot size was used. In 24 out of 46 patients, a constant fluence of 10 J/cm<sup>2</sup> was used during all treatment sessions. The remaining 22 patients started at lower fluences and underwent incremental increases in fluences of 0.5 J/cm<sup>2</sup> at each subsequent treatment.

## CAPSULE SUMMARY

- The use of Q-switched Nd:YAG laser for the treatment of xanthelasma shows conflicting claims of efficacy and no consensus in the minimum number of treatments.
- In this series, Q-switched Nd:YAG laser treatment showed excellent-to-complete clearance in all lesions who received 4 treatment sessions.
- Q-switched Nd:YAG laser should be considered for the treatment of xanthelasma.

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