

Original Article

# Argon laser versus erbium YAG laser in the treatment of xanthelasma palpebrarum



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## Abstract

**Background:** Xanthelasma palpebrarum is the most common of the xanthomas with asymptomatic, symmetrical, bilateral, soft, yellow, polygonal papules around the eyelids. Though it is a benign lesion causing no functional disturbance, it is esthetically annoying. The surgical laser offers an extremely elegant and powerful solution to this problem.

**Objective:** To evaluate the effectiveness of erbium:YAG and argon lasers in the treatment of xanthelasma lesions.

**Patients and methods:** Forty patients were included in the study. Twenty patients (15 patients were bilateral with 30 eyes either in the upper or lower lid and 5 patients were unilateral) were treated with erbium:YAG laser. Another 20 patients (10 patients were bilateral with 20 eyes and 10 patients were unilateral) were treated with argon laser.

**Results:** In the majority of treated patients (either treated with erbium:YAG or argon laser), xanthelasma lesions were completely disappeared or significantly decreased in size. Two patients showed pigmentary changes in the form of hypopigmentation with erbium:YAG laser (one case), another case showed hyperpigmentation. No intraoperative complication was observed. No significant scar or recurrence was observed.

**Conclusion:** Argon laser in xanthelasma is an easy, effective, and safe method of treatment for small lesions and YAG laser is more better for large lesions than argon laser.

**Keywords:** Xanthelasma, Argon laser, Erbium:YAG laser

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## Introduction

Xanthelasma is a disfiguring lesion. It appears as yellowish, flat, and soft plaques located most commonly on the medial portion of the eye lid. They may also be present as semisolid or calcareous masses.<sup>1</sup> Hyperlipidemia, thyroid dysfunction, and diabetes mellitus are possible pathogenic triggers.<sup>2</sup> Xanthelasma has been reported following erythroderma, inflammatory skin disorders, and allergic contact dermatitis in spite of normal lipid profiles.<sup>3</sup>

The mechanism that initiates macrophages accumulation, cholesterol uptake, and foam-cell formation in a normolipemic patient following an inflammatory skin disorder is not clearly understood. It has been suggested that increased plasma lipid peroxidation (derived from oxidized low-density lipoprotein) may lead to accumulation of cholesterol in macrophages and formation of foam cells.<sup>3</sup>

Histologically, well defined deposits of doubly refractile cholesterol and other lipids are found in macrophages which develop into foam cells (Touton giant cells). These changes

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initially are found in the connective tissue around the perivascular spaces in the upper dermis of the eye lids.<sup>4</sup>

Several different methods can be used to treat xanthelasma palpebrarum, including simple surgical excision which bears a considerable risk of side effects especially an ectropion and scarring,<sup>5</sup> cryotherapy,<sup>6</sup> chemical peeling with trichloroacetic acid, with risk of irritation and pain,<sup>7</sup> and laser treatment. Different types of laser were tried using carbon dioxide laser,<sup>8</sup> argon laser,<sup>9</sup> KTP laser,<sup>2</sup> erbium:YAG laser,<sup>10</sup> and pulsed dye laser.<sup>11</sup>

This study aims to evaluate the effectiveness of argon laser and erbium:YAG laser in the treatment of patients with xanthelasma palpebrarum.

**Patients and methods**

Forty patients were enrolled from the outpatient clinic of Mansoura Ophthalmic Center from June 2010 to August 2011. The patients were randomly treated. The determination of group for the individual was randomized (dependent on last digit of hospital ID number. If it was an even number the patient was treated with argon laser, if it was an odd number, the patient was treated with YAG laser). Patients were thoroughly informed about technique, postoperative results and possible complications and written consents were taken from all patients. All patients were carried out in accordance with the tenets of the Declaration of Helsinki (1989) of the world medical association. The study was approved by Mansoura University Hospital trust ethics committee.

**Patients preparations**

Before laser application, margin of the skin lesion was outlined with a black pen and local infiltration anesthesia by lidocaine HCl 2% was injected under the lesion.

**Settings of laser**

*Argon laser*

Slit lamp mounted argon laser was used with the following parameters, spot size 1000 μm, pulse duration 0.8–0.9 s, and energy varied from 600 to 800 mw. Patient instructed to close his eyes during laser application. Argon laser was used in continuous mode.

Coagulation of the lesion margin is started first, then toward the center. During laser application, subcutaneous tissues start to shrink. At the end of treatment, xanthelasma lesion looks smaller.

*Erbium:YAG laser*

Twenty patients (30 eyes) were treated with erbium:YAG laser. For smaller lesions, spots were used with diameter of 1.6 mm, energy of 300 mJ, frequency 1 Hz and number varying in relation to the extent of the pathology. When the area to be treated was more extensive, the frequency increased to 5 Hz while the diameter and energy remained the same. After having bordered off the xanthelasma with a row of spots, application was continued in a centripetal direction until the lesion was covered throughout.

**Post treatment**

Post treatment therapy was antibiotic-steroid ophthalmic ointment twice daily for 2 weeks. During this period, the crust which had formed falled within 7–14 days and newly formed layer of skin is seen.

Photographic documentation of the lesion before laser treatment and immediately afterward and at each of the successive checkup visits was carried out. Follow up period was 6 months. According to size and density of the lesion, one or more laser sessions were required. The results rating from good to excellent (excellent means the skin of the lesion returned normal as the rest of the surrounding skin, very good means the skin of the lesion returned nearly normal as the rest of the surrounding skin, good means the skin of the lesion had acceptable color.

**Results**

The study included 40 patients (65 eyes): 25 patients were bilateral with 50 eyes either in the upper or lower lid and 15 patients were unilateral, so, a total of 65 eyes. Twenty patients (35 eyes) were treated with argon laser (group 1) and 20 patients (30 eyes) were treated with Erbium:YAG laser (group 2). The sex, age, and lesion characteristic were included in [Tables 1 and 2](#).

During xanthelasma ablation either with argon or YAG laser, there was no pain or bleeding in all patients and laser treatment was well tolerated.

All lesions respond to laser, by formation of crust in xanthelasma followed by disappearance of xanthelasma or decrease in size. During this period, no complaint was noticed. No signs of inflammatory reaction or infection was noticed in all cases. The newly formed layer, originally was more pink in color and assumed a coloring homogenous with the surrounding tissue within 4–5 weeks.

**Table 1.** Demographic features among groups.

Age	Group 1				Group 2			
	Female		Male		Female		Male	
	No	%	No	%	No	%	No	%
30–40	2	10	–	–	2	10	–	–
41–50	5	25	4	20	6	30	4	20
51–60	4	20	5	25	4	20	4	20
Total	11	55	9	45	12	60	8	40

**Table 2.** Xanthelasma characters among groups.

Lesion character tics		Group 1	Group 2
Size	Texture	Number	Number
<1cm <sup>2</sup>	& soft, flat	15	12
<1cm <sup>2</sup>	& elevated, semisolid	6	7
>1cm	& soft, flat	15	6
>1cm	& elevated, semisolid	4	5
Total		40 in 35 eyes in 20 patients	30 lesion in 30 eyes In 20 patients

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