Efficacy of Ablative CO_2 Laser In The Treatment of Xanthelasma Palpebrarum: A Case Report

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Abstract

Xanthelasma are yellowish plaque on or near the eyelids, more common seen in women and those of Asian or Mediterranean descent. Anyone is susceptible to xanthelasma however the risk of developing xanthelasma is higher in those who are overweight or hyperlipidemic. Classical treatment option remain surgical excision, alternatively in our setting, chemical peel utilizing Trichloroacetic acid (TCA) and laser treatment using carbon dioxide, erbium, pulsed dye, argon, and Nd:YAG lasers can be used to treat xanthelasma palpebrarum. We hereby present a case of a 52-year-old Malay gentleman, who had 10 years history of yellowish plaque over inferonasal region of bilateral eyes. He was successfully treated with a single session of CO2 ablative laser under local anesthesia for total removal of yellowish plaque following the diagnosis made based on his clinical presentation. In conclusion, CO2 ablative lasers are effective in treatment for total removal of yellowish plaque within one session.

Keywords: xanthelasma plapebrarum, laser, Q-switched NdYAG,

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Xanthelasma is a lipid-rich deposition, mainly cholesterol that are commonly found near or on the eyelid, known as xanthelasma palpebrarum. It is characterized by semisolid yellowish papules and plaques that occurs more commonly at the inner canthus of the eyelids that can be treated by multiple methods. Surgical excision has been the treatment of choice for decades but not without the risk of side effect like ectropion. Other modalities like the use of cryosurgery, radiofrequency, chemical cautery utilizing trichloroacetic acid have shown mixed result often requiring multiple sessions and frequent recurrence [1,2]. The use of ablative and non-ablative laser has become popular which minimizes sequelae and recurrence. This case report will be focusing on the treatment of xanthelasma palpebrarum with ablative carbon dioxide laser.

Case Presentation

A 52y.o. Malay gentleman with no known medical illness, presented to the clinic with 10years of asymptomatic, multiple, painless, slow progressive, non-pruritic, elevated, yellowish plaque over inferonasal region of bilateral eyes. He did not seek medical attention previously as he wasn't disturbed by the appearance of these yellowish plaque however, he had started focusing on his skin health after retiring recently. He was otherwise healthy until 3 years ago whereby he was verbally informed to have mild elevated cholesterol levels during his health screening with blood investigations. He was then advised for a healthy lifestyle modification along with diet change.

On examination, there were multiple yellowish plaques that varies in sizes over the inferonasal region of both eyes. Right lower eye lid has 2 plaques measuring 0.4 x 0.3cm and 1.0 x 0.3cm, adjacent to one another. Left lower eyelid has 1 larger plaque measuring 0.7 x 1.3cm. Based on the history and presentation of the lesion, a clinical diagnosis of Xanthelasma Palpebrarum was made.

Management

The procedure was explained to the patient and informed consent was taken. He was treated with single treatment session with Pulse Carbon Dioxide ablative laser under local anaesthesia. Carbon Dioxide Laser (10600nm) setting were pulse mode, with power of 6Watts and 20 -90ms. Total removal of yellowish fatty tissue and

Figure 1: Location of the lesion

Figure 2: Pictures taken immediately after procedure. (a) Right; (b) Left

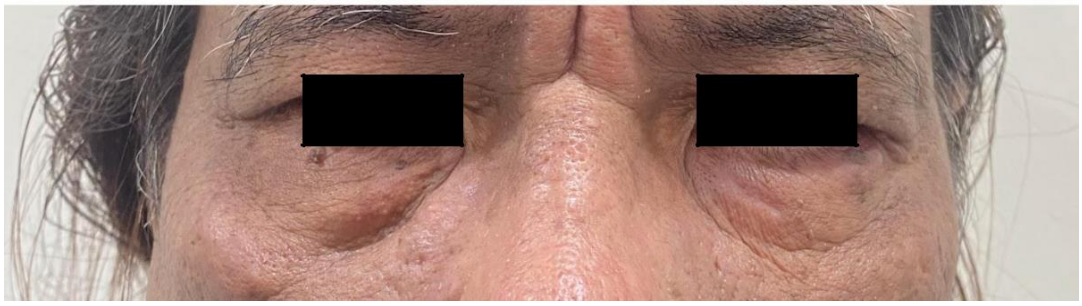

Figure 3: Picture taken 3 weeks after procedure.

appearance of underlying pink tissue was taken as endpoint of therapy. Mupirocin ointment was applied post procedure and he was asked to continue topical application twice daily till scabbing. He was instructed to keep the area clean and dry.

Outcome

Immediately post treatment, there were ulcerated lesions seen over the treated areas with no bleeding (Figure 2). After 3 weeks, he was reviewed to the clinic and the previous ulcerations was heal with no sign of scarring (Figure 3). After 4 months of procedure, the patient was followed up on and there was no sign of recurrence or scarring at the area of interest.

Discussion

Xanthelasma appears as yellow flat plaques over upper/lower eyelids, usually close to the inner canthus. The prevalence is estimated at 4% [3], with peaks seen in the fourth and fifth decades. It is more frequent in women and its prevalence increases with age. In many cases, it can be associated with an underlying dyslipidaemia. Histologically, xanthelasma represents lipid laden macrophages that are found in the superficial and mid-dermis [4].

Dyslipidaemia that presents with xanthelasma can stem from primary causes such as familial hypercholesterolaemia, or secondary causes such as obesity, diabetes mellitus, cholestatic liver disease, nephrotic syndrome, and certain medications [5]. However, xanthelasma may also occur in people with normal levels of circulating lipids. Even though xanthelasma is a clinical diagnosis, investigations are performed to rule out any associated primary or secondary dyslipidaemia. These include fasting lipid profile, fasting blood glucose, liver, thyroid and renal function tests.

The management of xanthelasma includes treating the associated dyslipidaemia, if there is any. Medical management includes lifestyle modifications such as regular exercise and low-fat diet, as well as lipid-lowering drugs. Although significant in the overall care of a patient with abnormal lipids, medical management has a limited role in the treatment of xanthelasma. There is no cutaneous complication that occurs with xanthelasma, and patients are often asymptomatic. However, treatment for its removal is still regularly sought for cosmetic purpose, as improving the dyslipidaemia does not always guarantee a regression of the xanthelasma. There is limited evidence in the literature that outlines the efficacy and safety of different treatment modalities for the removal of xanthelasma. Commonly cited treatments for xanthelasma removal include topical trichloroacetic acid (TCA), laser ablation and surgical excision.

Topical application of TCA 70% has been reported to be effective and well tolerated for flat plaques [6], whereas for papulonodular plaques, a higher concentration of TCA 100% was the most efficacious [7]. Overall, TCA treatment was found to be appropriate for smaller lesions, as larger lesions would require repeated procedures, and hence would result in

higher risk of pigmentation and scarring [8]. Post-inflammatory hyperpigmentation was reported at a rate of 9% - 12.5%, whereas hypopigmentation was reported at a rate of 21.5% - 33.4% [7,9]. Current literature also report recurrence between 25% - 39% [7,8].

Surgical excision has been used traditionally and often yields good cosmetic outcomes. Recurrence, however, is common and is reported to be as high as 40%-60% [10]. Therefore, it is usually advocated only for lesions involving the deep dermis or lesions infiltrating into underlying muscle. Laser ablation is an option that can be used to treat xanthelasma. The mechanism of action is said to involve destruction of lipid-laden macrophages via thermal energy, as well as coagulation of dermal vessels that prevent further lipid leakage into tissue to reduce recurrence. An array of lasers have been described in the literature, including CO2 and Er:YAG.

CO2 lasers target water, causing vaporization of water within cells and resulting in ablation of skin. There have been several studies employing CO2 laser to treat xanthelasma, majority of which report complete initial resolution. Raulin et al conducted a case series of 23 patients receiving high energy ultrapulsed CO2 laser therapy. The ultrapulsed CO2 enabled vaporization of a thin layer of tissue with sufficient thermal relaxation of surrounding tissue. All lesions could be completely removed with a single treatment, with only transient pigmentary changes (4% hyperpigmentation, 13% hypopigmentation) as side effects. No visible scarring occurred. Only three patients (13%) developed a recurrence of xanthelasma at the 10-month follow-up [11]. The efficacy and safety of super-pulsed versus fractional co2 laser treatment was compared by Esmat et al in a prospective randomised study of 20 patients. Results showed that a single session of ablative superpulsed co2 showed a more significant improvement of xanthelasma, compared to 3-5 sessions of monthly ablative fractional co2. However, side effects such as scarring, and recurrence were also more likely to occur [12].

Goel et al compared the efficacy of 30% TCA versus co2 laser in the treatment of xanthelasma in 50 patients. He concluded that both treatments were appropriate for clinically milder lesions. However, co2 laser was more superior than TCA 30% for severe lesions, as the study revealed that complete clearance was attained by the laser group, as opposed to only a 56% clearance rate for the TCA 30% group [13]. Co2 laser is likely to be more effective in these cases due to the associated coagulative effect that spreads beyond the ablative zone.

The Er: YAG is an ablative laser, with a smaller thermal coagulation zone compared to the co2 laser. Er: YAG has also been demonstrated to be successful in treating xanthelasma. It is reported have a faster healing time and lower risk of postinflammatory hypo- and hyperpigmentation compared to the co2 laser [14,15]. However, Lieb et al concluded that co2 laser was better suited to treat deeper lesions due to its hemostatic property [16]. Other lasers such as the Q-switched Nd: YAG, argon laser and KTP have also been employed to treat xanthelasma. Most of these lasers require multiple sessions with varying rates of clearance of lesions and recurrence. A review of a few case reports by Fusade, Karsai et al, Basar et al, shows that these lasers were less likely to achieve complete clearance of xanthelasma with a single session [17,18,19].

Conclusion

Despite being a relatively benign condition, which causes no functional problems, xanthelasma may cause significant psychological distress and treatment is very often sought for cosmetic reasons. It may also indicate an underlying dyslipidaemia, hence patients should be screened and managed

accordingly. There are multiple treatment modalities but there is currently no gold standard long-term treatment option, and recurrence is often seen with all therapeutic modalities.

In conclusion, our case report supports the safety and efficacy of a single session of CO2 laser for the removal of xanthelasma. To monitor for any recurrence of xanthelasma, patients will undergo periodic follow-up examinations (4 months, 6 months, and 12 months).

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