THE EFFECTS OF RADIOFREQUENCY IN XANTHELASMA OF EYELID: CASE REPORT

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Abstract

Xanthelasma palpebrarum is the most common form of xanthoma, which is mostly located on the eyelids. Various treatment options are available. All have applications, and none produce satisfactory outcomes. Radiofrequency thermal energy induces ionic agitation with vaporization at the cellular level in tissues. It uses a controlled radiofrequency current to reduce the tissue volume in a precise and controlled mode.

To the best of our knowledge, there are few published reports on the use of radiofrequency energy in the treatment of xanthelasma palpebrarum.

Here, we report a case of a 48-year-old woman with xanthelasma palpebrarum involving four lesions on the eyelids that was treated by radiofrequency. Three of the lesions had regressed at the sixth postoperative month, and the fourth (left superior medial angle of eyelid) was reduced in size, with minimal ectropium.

Radiofrequency is an easy, safe, quick, inexpensive, and effective treatment for xanthelasma palpebrarum. After treatment, wound healing is quick and successful. Cosmetic results are satisfactory. Controlled prospective studies are needed to compare outcomes at different voltages.

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Introduction

Various treatment options are available for xanthelasma palpebrarum (XP). All treatments have limitations, and none of them produce satisfactory outcomes. Radiofrequency (RF) thermal energy induces ionic agitation with vaporization at the cellular level in tissues. RF leads to fibrotic changes and volume reduction in tissues during the healing period[1].

The frequency of RF ranges from 300 kHz – 3000 kHz for radiofrequency (RF) and designed as medium frequency. These ranges represent one of several conventions used to define this part of the electromagnetic spectrum. Biological effects of electromagnetic fields have been studied since the turn of the past century. In developed countries, there has been a remarkable growth in the number of process and devices that utilize or emit radiofrequencies[2]. It uses a controlled RF current to reduce tissue volume in a precise and controlled mode[2].

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This technique treats lesions, with minimal impact on the surrounding tissues, making it appropriate for delicate areas. The necrotic tissue in the lesions is gradually reabsorbed as part of the body's natural process, thus reducing the tissue volume. The most popular use of RF in medicine is in ear, nose, and throat (ENT) clinics. RF is also used in plastic surgery.

XP is the most common form of xanthoma, which is characterized by the presence of fibroproliferative connective tissue. XP lesions are usually located at the medial angle of the eyelids and appear as soft, velvety, yellow–orange papules or plaques[3–7].

The diagnosis of XP can be made on clinical grounds alone[1]. Although XP is a benign condition and almost never limits functioning, its appearance is often seen as cosmetically disturbing. Surgical excision has been the treatment of choice for decades. Many diverse treatments can be selected for XP, such as

surgical excision, laser ablation (carbon dioxide [CO2], argon, erbium-doped yttrium aluminum garnet [Er: YAG], pulsed dye), cryosurgery, bichloracetic acid peeling, and trichloroacetic acid peeling[3–5, 8-13]. However, all these treatment options have limitations and considerable risks of side effects, especially an ectropion, which could lead to additional procedures and possibly a full-thickness skin graft.

To the best of our knowledge, there are few published reports of RF energy in the treatment of XP. There was one prospective study conducted by Dincer et al.[12] and a pilot study showing the efficacy of low-voltage electrocoagulation for periorbital syringomas[10]. Here, we report a 48-year-old woman with XP involving four lesions on the eyelids that was treated by RF.

Case Report

A 48-year-old female was admitted to the Akademi Private ENT Surgery Centre. The physical examination revealed four xantolesma lesions, two on the superior medial and two on the inferior medial eyelids. The lesions were irregular and 5–10 mm in size (Fig. 1).

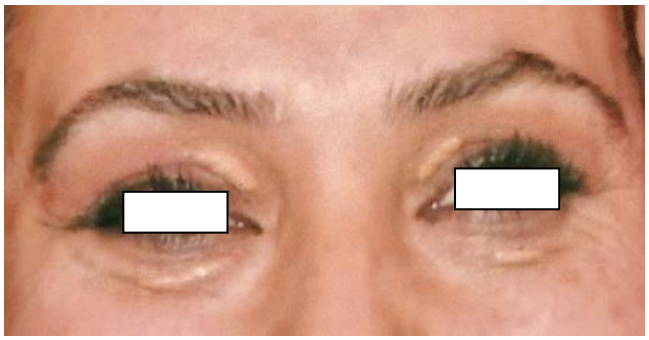

Figure 1. Before treatment of radiofrequency.

The patient was examined before RF treatment, at the end of RF treatment, and six and 24 months later at follow-up visits. Improvement in the lesions was judged according to a clinical examination of the before and after photograph. Digital photograph was taken using the same camera settings and lighting conditions (Cyber-Shot, Sony, Japan). We used a G3 Gyrus RF generator (Gyrus ENT, ACMI, An Olympus Company, Canada) with the target temperature set at 75° C, and the RF energy set at 200 J. A total energy of 400 J was used to treat each lesion. RF works on the principle of increasing the frequency and voltage while simultaneously decreasing the amperage of the alternating current to generate oscillating radio waves[13]. The G3 Gyrus RF unit produces a monopolar current at 2.0 mHz (i.e., a medium dosage of RF). During the procedure, the active portion of the needle was inserted longitudinally.

There wasn't active herpetic lesions in the periorbital area, scars, and keloids, use of medicines for anticoagulation, history of a pacemaker, skin phototype IV or V, diabetes mellitus, and any history of allergies. An additional the patient had not received any topical or surgical treatments in the previous month. Serum cholesterol levels were all in the normal ranges (High Density Lipoprotein: 67, Low Density Lipoprotein: 112, Very Lowe Density Lipoprotein L: 18). Another biochemical test was normal range. During and after the RF treatment, the patients were asked to grade their level of discomfort as none, mild, moderate, or marked. They were also questioned about adverse effects, such as pain, sensation, pruritus, burning, swelling, and erythema. Complications, such as hypopigmentation or hyperpigmentation and actropion, were noted. The patients provided written informed consent before enrollment.

The treatment sites were first cleaned with 10% polividon normal standardized solution, followed by topical anesthetic cream (lidocaine with prilocaine) applied to the lesions 30 min before treatment. The patient was treated with middle voltage RF (MVRF). The efficacy of the MVRF was calculated by clinical score using a 5-point scale where 0 = no result; 1 = mild result (25% clearance); 2 = moderate result (25–50% clearance); 3 = good result (50–75% clearance); and 4 = excellent result (75-100% clearance). The lesions of eyelids were photographed before and after application. This method of assessment was taken from Al Aradi's study[10].

We used saline solution to increase the conductibility. A disposable gyrus electrode was fixed to the handpiece and applied to the lesions. The electrode was applied superficially to each lesion and inserted beneath the lesion. A cold pack was used for reducing erythema and swelling for 10 minute at the end of the treatment. Fucidic acid cream was used to reduce risk of infection twice daily for one week. The patient was discharged without any limitation of normal daily functioning. Page: 129
The first control examination were performed one

week after the treatment. A second application was not given.

At the sixth month, three of the lesions had regressed, and the size of the fourth lesion (left superior medial angle of eyelid) had decreased, with minimal ectropium. The minimal ectropium may have been due to infection in fourth lesion after the MVRF application.

Also the wrinkles of eyelids had decreased. The patient was satisfied with the result because of the improvement in the appearance in the lesions. Clinical photograph of our patient are shown in Figure 1 (before the RF treatment) and Figure 2 (24 months after the RF treatment).

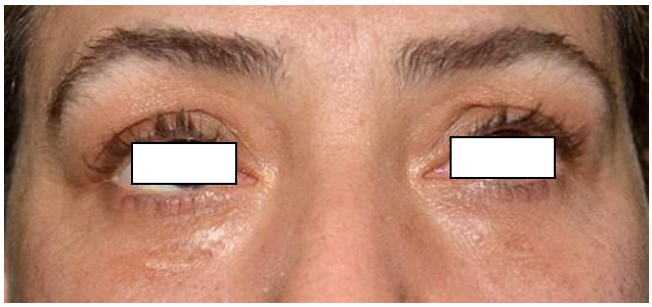

Figure 2. After twenty-four months of treatment of radiofrequency.

Discussion

XP is the most common cutaneous xanthoma that presents in the periocular region. Laser surgery for XP has increased in popularity[14]. Argon, pulsed dye, CO2, Er: YAG, and Q-switched neodymium-doped (Nd): YAG lasers can be used to treat XP[1,3,6,12–17]. Despite the safety of these procedures in experienced hands, postoperative complications affecting the periocular region and the eye itself may follow laser surgery. Common complications are persistent erythema, hyper - and hypopigmentation, hypertrophic scarring, skin infections, severe burns, transitory or permanent lower lid ectropion, and corneal injuries or ocular perforation[15]. A high recurrence rate and frequent scarring have eliminated the argon laser as a therapeutic option for XP. Likewise, insufficient penetration depth limits dye lasers[16].

Argon, pulsed dye, and CO2 lasers also have some disadvantages, including the risk of scarring and postoperative dyspigmentation[8,13,16].

Er: YAG and Q-switched Nd: YAG lasers were reported to induce swelling, bleeding, and crusting[15,18].

Trichloroacetic acid can be used for small lesions, but if the lesion is large, common side effects such as atrophy, scarring, and hypo- or hyperpigmentation can occur[2]. A Koebner-like phenomenon was also reported with the treatment of lesions with TCA[19].

To the best of our knowledge, this is the first study of the efficacy of MVRF for the removal of XP. The objective of this paper was to evaluate the efficacy of MVRF treatment for XP. An additional goal was to identify an easy way to treat XP. There was one complication (infection) in left medial angle of eyelid. Complications are common with all other treatment methods. We are not sure whether the minimal ectropion was due to infection or the RF treatment.

There was no significant side effects when compared with those of other treatment modalities. The patient found the procedure tolerable. Topical anesthesia was sufficient for our patient. This may be related to the medium voltage used during the treatment session. As we used saline solution in the treated areas to increase the conductibility, there was no need to increase the voltage.

Conclusions

In conclusion, RF is an easy, quick, safe, effective, and inexpensive method for the treatment of XP. If the lesions are too close to the eyes or multiple or patched with indistinct borders, RF is appropriate. After treatment, wound healing is quick and successful.

Cosmetic results are satisfactory. RF should be considered as an alternative treatment for XP, especially when treating periorbital. Larger studies are required that include one-to-one comparisons of the RF method with other treatment methods, particularly laser therapies, for XP.

Such studies should include analyses of the efficacy, degree of radiofrequency, side effects, and cost effectiveness of RF.

Declaration of Interest

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