

Treatment of Sebaceous Hyperplasia with Pulsed Dye Laser

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Abstract

Background: Sebaceous hyperplasias are benign skin lesions mostly seen on the face. These lesions are a common cosmetic concern but are difficult to be treated, as the entire sebaceous gland needs to be destroyed. Multiple treatment modalities have been employed for the management of sebaceous hyperplasia but some therapies are associated with side effects and recurrence rates. The pulsed dye laser may be an effective and safe alternative treatment option.

Aim of Study: To evaluate the efficacy of pulsed dye laser in treating sebaceous hyperplasia.

Patients and Methods: Twenty patients with a total of 72 sebaceous hyperplasia lesions were treated by 1-3 sessions of pulsed dye laser, two weeks apart (with parameters of hand piece 7, fluence 9-12J/cm², pulse width 1.5ms, rate 1HZ and air cooling). The patients were assessed clinically to evaluate the efficacy and safety of PDL.

Results: 83.3% of lesions responded to treatment, with complete reduction in 46 lesions (63.9%) and partial reduction in 14 lesions (19.4%). Treatment was well tolerated with no side effects and high patient satisfaction.

Conclusion: Pulsed dye laser is effective and safe as a monotherapy for treating sebaceous hyperplasia.

Key Words: Sebaceous hyperplasia – Pulsed dye laser.

Introduction

SEBACEOUS hyperplasia is a benign cutaneous condition of sebaceous glands that causes cosmetic concerns in middle aged and elderly patients [1]. It commonly appears as single or multiple soft yellowish papules of various sizes with a central umbilication, in highly sebaceous areas especially the face [2].

The pathogenesis surrounding sebaceous gland hyperplasia involves the changing hormonal environment that comes with increasing age [3]. Declining levels of androgens leads to a decrease in

sebocyte turnover that leads to an increase in sebocytes within the gland and thus hyperplasia. The effect is most pronounced over the face [4]. Additional hormonal factors such as insulin, TSH and hydrocortisone have been found to increase sebocyte proliferation [5]. Extrinsic factors including UVB light [6] and immunosuppressant agents such as cyclosporine play a role in SGH [7].

Successful therapeutic modalities has been described including surgical excision, curettage, cryotherapy, chemical ablation and CO₂ laser but all of which are aggressive and involve a high risk of scarring and pigmentary changes [8].

Pulsed Dye Laser (PDL) is considered the gold standard for many vascular indications, such as port-wine stains, haemangiomas, and telangiectasias. It has also gained FDA approval for the treatment of numerous nonvascular conditions, including, rhytides, benign cutaneous lesions such as acne, warts, psoriasis and scars and it is a good option in treating sebaceous hyperplasia [9,10].

PDL eliminates SGH quickly, easily, painlessly and only involves a transient purpuric effect. The effect of PDL could be explained by its selective action on the telangiectatic component of the lesion causing destruction of the vessels that nourish the sebaceous hyperplasia, leading to its reduction [11].

Aim of the study:

This study aimed to evaluate the efficacy of pulsed dye laser in treatment of sebaceous hyperplasia.

Patients and Methods

Patients:

The present study was carried out on 20 patients with sebaceous hyperplasia, diagnosed clinically on the basis of typical appearance of skin lesions.

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They were collected from the Outpatient Clinic of Dermatology and Venereology Department, Tanta University Hospitals over a period of 12 months from June 2016 – June 2017. The study was approved by the Research Ethics Committee and all participants signed an informed consent before participation in the study.

Patients with active infection, immunodeficiency conditions, wound-healing abnormalities, receiving hormonal treatment or systemic retinoids and those under chemical peeling and dermabrasion were excluded.

Methods:

Complete history taking, and full general and dermatological clinical examination were done for the patients.

Laser treatment for all patients with 595nm PDL (DEKA, SynchroVasq, Serial number: QA3B2501. Italy). Local anesthesia (lidocaine cream) was applied 30 minutes before the technique. Pulsed dye laser was used with hand piece 7mm, fluence 9-12J/cm², width 1.5ms, rate 1HZ and integrated air cooling system. All patients were subjected to one to three sessions of 595nm pulsed dye laser, two weeks apart. Photographs were taken before and after treatment in order to assess the degree of clinical improvement.

Clinical efficacy of treatment was categorized into (>75%) as excellent improvement, (50-75%) as marked improvement, (25-50%) as moderate improvement, (<25) as mild improvement and no response when no improvement at the end of therapy.

Statistical analysis of the data:

Data were analysed using IBM SPSS software package Version 20.0. (Armonk, NY: IBM Corp) Qualitative data were described using number and percent. The Kolmogorov-Smirnov test was used to verify the normality of distribution Quantitative data were described using range (minimum and maximum), mean, standard deviation and median. Significance of the obtained results was judged at the 5% level.

Results

The results of this study revealed the following:

Clinical data:

The total number of patients was 20 patients including 10 females (50%) and 10 males (50%), their ages ranged from (40 to 73) years with a mean \pm SD of (52.75 \pm 10.94) years and median

about (52.50) years. Age of onset ranged from (30 to 67) years with a mean \pm SD of (48.65 \pm 10.80) years and median about (49.50) years. The duration of disease ranged from (6 months to 10 years) with a mean \pm SD of (4.08 \pm 3.14) years and median about (3.50) years. Four patients had positive family history of sebaceous hyperplasia (20%) and sixteen patients had negative family history of sebaceous hyperplasia (80%). Eight patients had Fitzpatrick's skin type III (40%) and twelve patients had Fitzpatrick's skin type IV (60%).

Concerning the site of sebaceous hyperplasia, all lesions were in the face. There was 10 patients (50%) had sebaceous hyperplasia in cheek, 6 patients (30%) had sebaceous hyperplasia in chin, 2 patients (10%) had sebaceous hyperplasia in eyelid, 14 patients (70%) had sebaceous hyperplasia in forehead and 6 patients (30%) had sebaceous hyperplasia in nose.

Clinical results after pulsed dye laser therapy:

- *Regarding clinical evaluation of patient's improvement:* Eight patients (40%) showed excellent improvement, four patients (20%) showed marked improvement, two patients (10%) showed moderate improvement, two patients (10%) showed mild improvement and four patients (20%) showed no improvement.
- *Regarding the rate of reduction of SH lesions:* A total number of lesions of sebaceous hyperplasia was 72; complete reduction was noted in 46 lesions (63.9%), partial reduction was noted in 14 lesions (19.4%) and non reduction was noted in 12 lesions (16.7%).
- *Regarding patients' satisfaction:* Fourteen patients (70%) were satisfied and six patients (30%) were not satisfied.

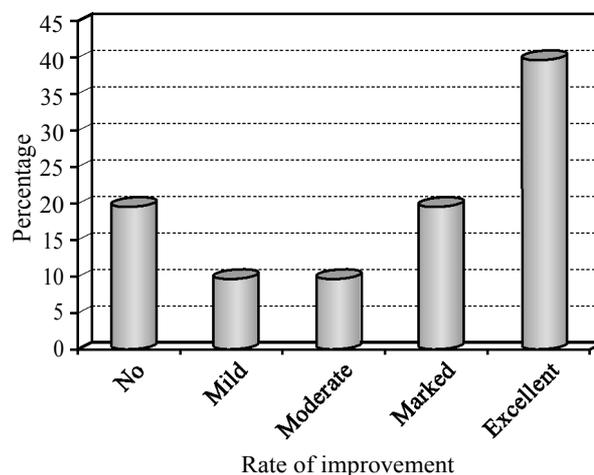


Fig. (1): Distribution of the studied cases of sebaceous hyperplasia according to rate of improvement (n=20).

Photo (1): A patient with sebaceous hyperplasia before treatment (A,C), and after pulsed dye laser therapy (B,D) showing excellent improvement.

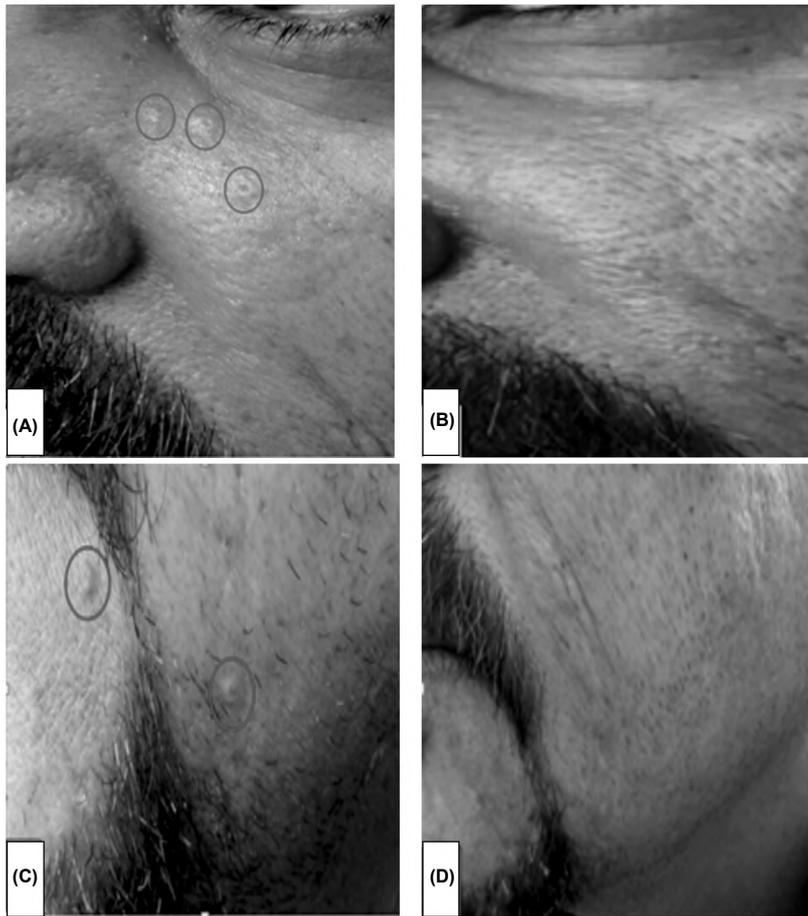
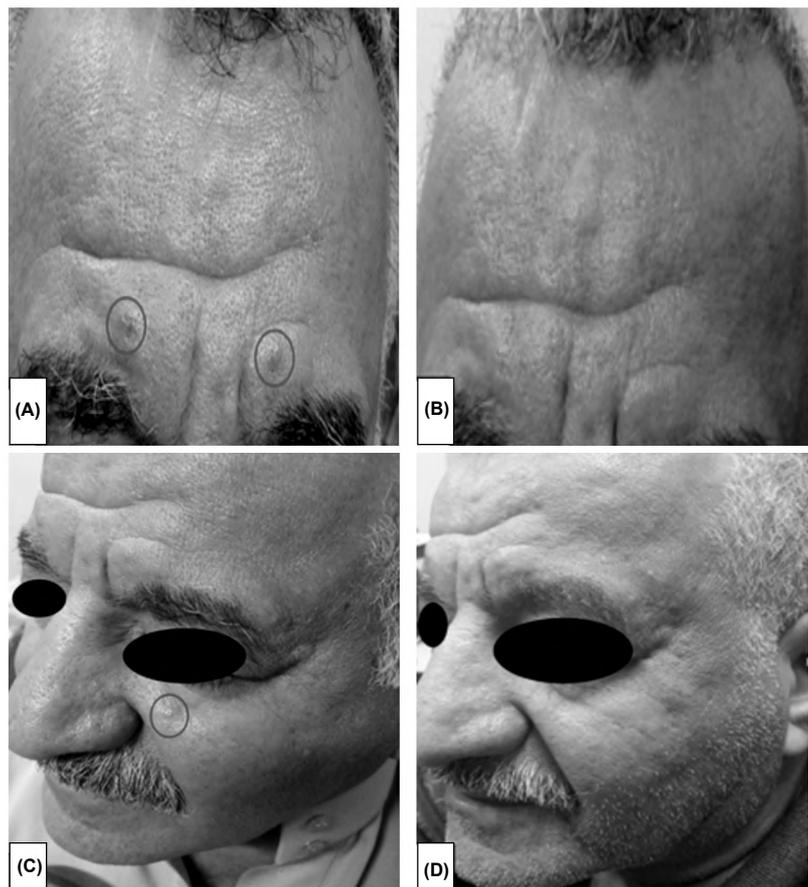


Photo (2): A patient with sebaceous hyperplasia before treatment (A,C), and after pulsed dye laser therapy (B,D) showing excellent improvement.



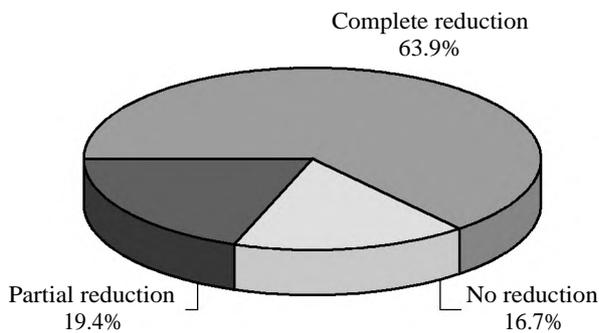


Fig. (2): Distribution of lesions of sebaceous hyperplasia according to reduction rate after treatment with pulsed dye laser.

Discussion

Treatment of SH is challenging because the entire sebaceous gland needs to be destroyed. Successful therapeutic modalities include cryotherapy, surgical excision, electrodesiccation, carbon dioxide laser and erbium-doped yttrium aluminium garnet (Er:YAG) laser [12]. However, these options bear the considerable risk of intra and post-operative bleeding, discoloration, and scar formation [9]. Oral isotretinoin has been used but has a high relapse rate with discontinuation. Photodynamic therapy has been reported to be effective, but the procedure is painful, expensive, and time-consuming [8,13].

The principle of selective photothermolysis proposed by Anderson and Parrish in the early 1980s, had led to a new generation of highly selective pulse lasers in dermatology. Pulsed Dye Laser (PDL) has been successfully used to treat many vascular lesions for the past 25 years such as port-wine stains, haemangiomas, and telangiectasias. It is regarded as the standard treatment for vascular malformations, such as port wine stain [14], and is also effective in treating numerous non vascular conditions including rhytides and benign cutaneous lesions such as verruca vulgaris, scars, striae, psoriasis, acne vulgaris and sebaceous hyperplasia by targeting feeding vessels of the lesions [15].

So, the aim of this study was to evaluate the efficacy of pulsed dye laser in the treatment of sebaceous hyperplasia.

In the current study, more than 80% of lesions responded to treatment, with complete reduction in (63.9%) and partial reduction in (19.4%). Also, 70% of patients were satisfied with treatment.

Current study agreed with the study of Wang et al., [16] which included eight patients with a

total of 75 SH lesions who were treated with pulsed dye laser in split face study. One side was treated with two sessions of 595-nm SPDL with 0.45 millisecond pulse duration, 5mm spot size and 9-11J/cm² fluence, and the other side was treated with two sessions of 595-nm LPDL with 20 millisecond pulse duration, 5mm spot size and 13-21 J/cm² fluence. After the first session, all SH lesions responded to single SPDL treatment with complete reduction in five of 42 lesions (11.9%) and partial reduction in 37 of 42 lesions (88.1%). By contrast, none of the lesions completely disappeared after receiving single LPDL treatment, while partial reduction was noted in 21 of 33 lesions (63.6%) and nonresponse in 12 of 33 lesions (36.4%). All SH lesions responded to two sessions of SPDL or LPDL treatments with complete reduction in 20 of 42 lesions (47.6%) treated by SPDL and in 11 of 33 lesions (33.3%) treated by LPDL. The rest of the lesions all showed partial reduction.

Good results were stated by Schönermark et al., [9] who reported for the first time complete remission of sebaceous hyperplasia in two patients using 6.5 to 8J/cm² (585nm, 0.45ms, 5mm) after two to three treatments. Another study by Aghassi et al., [11] showed that the majority of sebaceous hyperplasia lesions responded to a single session of SPDL therapy (7 to 7.5J/cm², 585nm, 0.45ms, 5mm), with a complete reduction in 28% and partial reduction in 93% of lesions. Also, Gonzales et al., [17] successfully treated a patient's sebaceous hyperplasias with 7J/cm² (585nm, 5mm). Through confocal imaging, the authors were able to show selective photothermal damage confined to blood vessels.

In the current study regarding to side effects, all patients showed no side effects except mild pain and purpura. Efficacy for some conditions requires purpura as an endpoint, whereas nonpurpuric settings are effective for others [18]. This agreed with Schönermark et al., [9] and Gonzales et al., [17] who showed that treatment of sebaceous hyperplasia has no or minimal side effects.

Pulsed dye laser was found to be effective in treatment of sebaceous hyperplasia. The effect of PDL could be explained by its selective action on the telangiectatic component of the lesion, leading to destruction of the vessels that nourish the sebaceous hyperplasia [19].

In vivo CM was used to explain the involution of these lesions after laser therapy. It showed that a few minutes after application of the beam, the vessels surrounding the sebaceous duct were re-

placed by amorphous and coagulated material. Selective photothermal damage was confined to the supporting microvasculature, followed by decreased epidermal hyperplasia within the ductal infundibulum, and a profound reduction in the size of the hypertrophic sebaceous gland, including undifferentiated sebocytes [17].

Conclusion:

Pulsed dye laser therapy was proved clinically to be safe and effective treatment modality for sebaceous hyperplasia. However, much more studies are still needed to confirm these findings.

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علاج تضخم الغدد الدهنية بليزر الصبغة النابضة

المقدمة: تضخم الغدد الدهنية هي آفات جلدية حميدة تظهر غالبا في الوجه وتسبب مخاوف من الناحية التجميلية ويعد علاجها صعبا إذ يحتاج لتدمير الغدة بأكملها. وقد إستخدمت طرق متعددة للعلاج مثل الإستئصال الجراحي، الكي، العلاج بالتبريد، العلاج الكيميائي وليزر ثاني أكسيد الكربون ولكن بعض العلاجات مرتبطة بالآثار الجانبية ومعدلات التكرار، ومن الممكن أن يكون ليزر الصبغة النابضة بديل علاجي آمن وفعال حيث يظهر تأثيره من خلال العمل الإنتقائي على الأوعية المتوسطة بالأفة مسببا تدمير الأوعية الدموية التي تغذى الغدد الدهنية، مما يؤدي إلى إختزالها.

الهدف من الدراسة: تقييم فاعلية ليزر الصبغة النابضة في علاج تضخم الغدد الدهنية.

المرضى وطرق البحث: إشمطت الدراسة على عشرين مريضا بإجمالى ٧٢ آفة من الغدد الدهنية المتضخمة تم جمعهم من العيادات الخارجية لقسم الجلدية والتناسلية بمستشفيات جامعة طنطا ووافقوا على الإنضمام إلى الدراسة ووقعوا موافقة خطية وقد تعرض جميع المرضى لأخذ التاريخ الكامل والفحص الإكلينيكي والجلدى الشامل وتم علاجهم بواسطة ليزر الصبغة النابضة من خلال جلسة واحدة إلى ثلاث جلسات لكل مريض بفاصل إسبوعين بين كل جلسة والأخرى، وقد تم أخذ صور فوتوغرافية للمرضى قبل بدء العلاج، أثناء فترة المتابعة وبعد الإنتهاء من العلاج وتم تقييم المرضى إكلينيكيا لبيان فاعلية وأمان ليزر الصبغة النابضة.

النتائج: أظهرت الدراسة تحسنا في معظم المرضى وإستجابات غالبية الآفات للعلاج حيث حدث إختزال كلى ل ٤٦ منها بنسبة (٩٠.٦٣٪) وإختزال جزئى ل ١٤ منها بنسبة (٤.١٩٪)، وقد حاز العلاج على إستحسان المرضى ولم تظهر أى آثار جانبية.

الإستنتاج: نستنتج من هذه الدراسة أن جهاز ليزر الصبغة النابضة فعال وآمن في علاج تضخم الغدد الدهنية.