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ORIGINAL ARTICLE

Laser surgery in rhinophyma

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ABSTRACT

BACKGROUND: Rhinophyma is a benign, disfiguring disorder, commonly referred to as the end-stage of severe rosacea and characterized by a progressive thickening and hypertrophy of the nasal skin and soft tissues. The aim of this paper was to evaluate the efficacy of CO_2 laser compared to other laser techniques and surgical methods in the treatment of rhinophyma.

METHODS: Twenty-four rhinophyma patients were treated with CO_2 laser in our institution from 2003 to 2013. A 10,600-nm CO_2 pulsed laser was used in all patients, with a 6-month, post-treatment follow-up.

RESULTS: Six months after the last laser session, all patients showed global improvement of their clinical conditions: 19 (79.1%) high improvement (>75%), 4 (16.7%) moderate improvement (50-75%), and 1 (4.2%) low improvement (<25%).

CONCLUSIONS: Our study demonstrates that carbon dioxide laser warrants a careful nasal surface ablation, allowing the remodeling of the hypertrophic areas, with an excellent cosmetic result, a very short healing time, and virtually no side effects.

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Key words: Rhinophyma - Therapeutics - Carbon dioxide.

Rhinophyma is a benign, disfiguring disorder characterized by a progressive thickening and hypertrophy of the nasal skin and soft-tissue.[1] It is much more common in men, with a male:female ratio varying from 5:1 to 30:1, occurring mainly in Caucasian people. Although it is commonly referred to as the end-stage of severe rosacea, rhinophyma can also be caused by chronic, edematous, sebaceous and connective tissue hypertrophy.[2] Clinically, the nose shows erythema, telangiectasia and thickening of the skin, with prominent pilosebaceus structures. Rhinophyma is the most common disorder; however, other variants have been reported in current literature: gnatophyma (chin), metophyma (forehead), otophyma (ears) and blepharophyma (eyelids).[3]

In the past, this deformation of the nose has been described with the term "whisky nose." Although facial flushing is caused by vasoactive substances such as alcohol and caffeine which may exacerbate the condition, in the literature there is no evidence for a causal relationship between chronic alcoholism and rhinophyma.[4] The psychological impact is an important aspect of this disease, thus the use of treatment options that yield high patient satisfaction is highly recommended. This disease, however, is not solely an esthetic problem; in severe cases of rhinophyma, secondary nasal airway obstruction have also been observed.[5]

Possible treatment options for rhinophyma are typically divided into two broad categories, i.e. nonsurgical and surgical (Table I). Among the non-surgical treatment options, antibiotics (mainly tetracycline and macrolides) and retinoids (isotretinoin) are the most widely

TABLE I.—*Therapeutical approaches to rhinophyma.*

Pharmacologic treatments	Surgical treatments	Other treatments
– Macrolides	– Carbon dioxide laser	– Radiofrequency
– Tetracyclines	– Cryotherapy	– Coblation
– Metronidazole	– Elettrocautery	– Photodynamic therapy (PDT)
– Isotretinoin	– Skin graft knife	
	– Razor blade	
	– Scalpel	
	– Ultrasonic scalpel	
	– Dermabrasion	
	– Hydrojet excision	
	– Bipolar electrocoagulation	

used, They have an anti-inflammatory and sebaceous gland-reducing activity; yet limited results have been shown with the aforementioned treatment modalities.[6]

Surgical treatment of rhinophyma has the main benefit of reducing nose's dimension significantly. The surgical approach can be performed via a complete or non-complete excision, followed by re-epithelialization. The complete excision is less preferred, due to the formation of significant scarring, inexact color and texture matching, and essentially poor cosmetic results; moreover, it also presents some other disadvantages, like a limited depth control, which makes it difficult to recreate the aspect "natural nose". Better results are obtained via incomplete excision techniques, such as cryosurgery, dermabrasion, electrosurgery, and laser surgery.[7, 8]

Laser options to treat rhinophyma consist of argon laser, Er:YAG, and CO_2 laser. The formation of atrophic scarring and hyperpigmentation, however, has limited the use of argon. The use of Er:YAG laser is limited due to its lacking capacity to coagulate during the surgical procedure, resulting in a difficult vision of the surgical field.[9]

Our aim in the current study was to demonstrate that CO_2 laser is a superior technique compared to other laser techniques and surgical methods, mainly because it produces minimal bleeding, thus allowing more precise and controllable esthetic and functional results.

Materials and methods

Patients

A total of 24 Caucasian patients with rhinophyma (20 males and 4 females; range of age 50-83 years; Fitzpatrick skin types I-IV, mainly II-III) were treated in our institution's Outpatient Clinic from April 2003 to April 2013. The patients were treated after obtaining a detailed personal history (clinical manifestations, general health conditions, previous medications, and life-style). Exclusion criteria consisted of patients who underwent isotretinoin therapy six months prior to laser surgery. The study design was approved by the local Institutional Review Board, according to the Helsinki Declaration, and informed consent was obtained from each patient. Cutaneous biopsies were also taken in order to exclude the presence of any disease possibly mimicking rhinophyma.[10, 11]

A three-severity stage classification of rhinophyma was used: 1) minor rhinophyma (telangiectasias and mild thickening or textural change on the nose); 2) moderate rhinophyma (nasal thickening and early formation of lobules); and 3) major rhinophyma (presence of both nasal hypertrophy and prominent lobules).[12] We enrolled 3 patients with minor, 7 with moderate, and 14 with major rhinophyma.

The patients were treated for a maximum of 4 months, receiving a mean of 4-laser sessions (range 2-6) with a 3-week interval.

Photographs were taken with a Canon digital camera and a polarized flash (Anthology System, DEKA-M.E.L.A, Calenzano, Florence, Italy) before and after each session, and 3, 6, and 12 months after the final treatment. The pictures were standardized using the same camera, shooting setting, twin flash, ambient light and chin holder to guarantee the same distance.

Six months after the last session, the results were independently scored by 3 dermatologists who had not taken part in the treatments. They assessed the performance of this CO_2 laser by means of 3 categories of improvement (high, >75%; moderate, 50-75%: and low,

<25%), based on disappearance rate of teleangectasias, lobules, sebaceous glands hyperplasia and nasal ipertrophy.

Laser treatment

CO_2 laser surgery was performed under local anesthesia with a 1% lidocaine solution (Xilocaine®). A 10,600-nm CO_2 pulsed laser (Smart Xide² laser DEKA-M.E.L.A., Calenzano, Florence, Italy) was used in all patients with the following parameters: starting power of 5-25 Watt, continuous mode (CW). Then change to a pulsed mode (DP) with a starting power of 5 W with a frequency of 80-50Hz until a power of 1W with a frequency of 10Hz. We preferred to work with low power setting in order to avoid collateral effect such as atrophy and loss of cutaneous adnexals. The operator using CO_2 laser performed a gradual removal of hypertrophic tissue, making sure that the natural nasal profile was maintained. The endpoint of the ablation was achieved upon the appearance of a honeycomb aspect leaving residual sebaceous glands to allow re-epithelization (Figure 1). There was a continuous vacuum suctioning of the smoke during the procedure through a suction device system. All patients were medicated with topical antibiotic cream under a simple dressing. They were also told to wash the wound and apply the cream on a daily basis for 15 days.

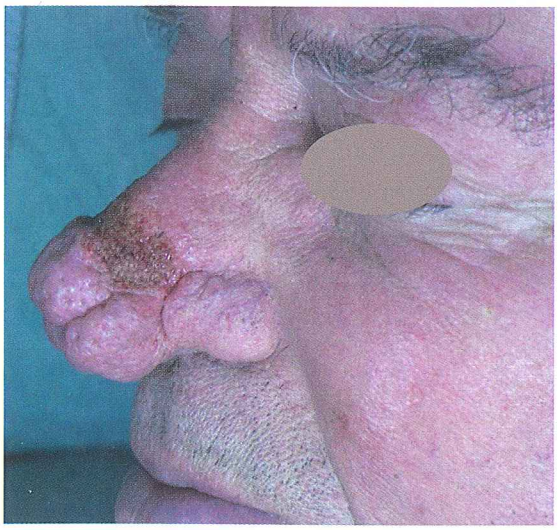


Figure 1.—The honeycomb aspect of the residual sebaceous glands after the vaporization.

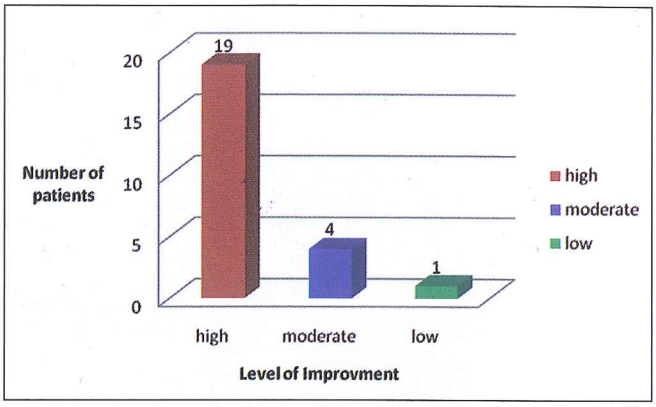


Figure 2.—Dermatologist based assessment: improvement of rhinophyma.

Results

Six months after the last laser session all the patients showed global improvement of their clinical conditions: 19 (79.1%) showed high improvement (>75%), 4 (16.7%) moderate improvement (50-75%), and 1 (4.2%) low improvement (<25%) (Figure 2).

The re-epitheliazation started days immediately after laser treatment and was completed within 3 weeks. Initially, formation of serous exudates and significant erythema was observed, yet fading in a few weeks. No major side effects, such as bacterial infection, scarring, and hyperpigmentation, were reported in any of our patients (Figures 3-5).

Discussion

Rhinophyma may be clinically diagnosed. In our opinion, however, it is better to make a skin biopsy to confirm the diagnosis. It can become very important in order to rule out the presence of cutaneous lymphoma (Figure 6), angiosarcoma, sebaceous carcinoma or other malignant lesions which can mimic rhinophyma.[13] In this way, the physicians are able to approach the lesions more safely, without taking potential legal risks due to a wrong diagnosis and consequent treatment's choice.

Several techniques have been reported to be useful in treating rhinophyma such as excision, decortications, dermal abrasion, cryosurgery, and dermal shaving, but currently we have no clear consensus on the best one.[14] Using the aforementioned techniques the physicians have several disadvantages pertaining to side effects such as excessive bleeding and unsatisfactory esthetic results.

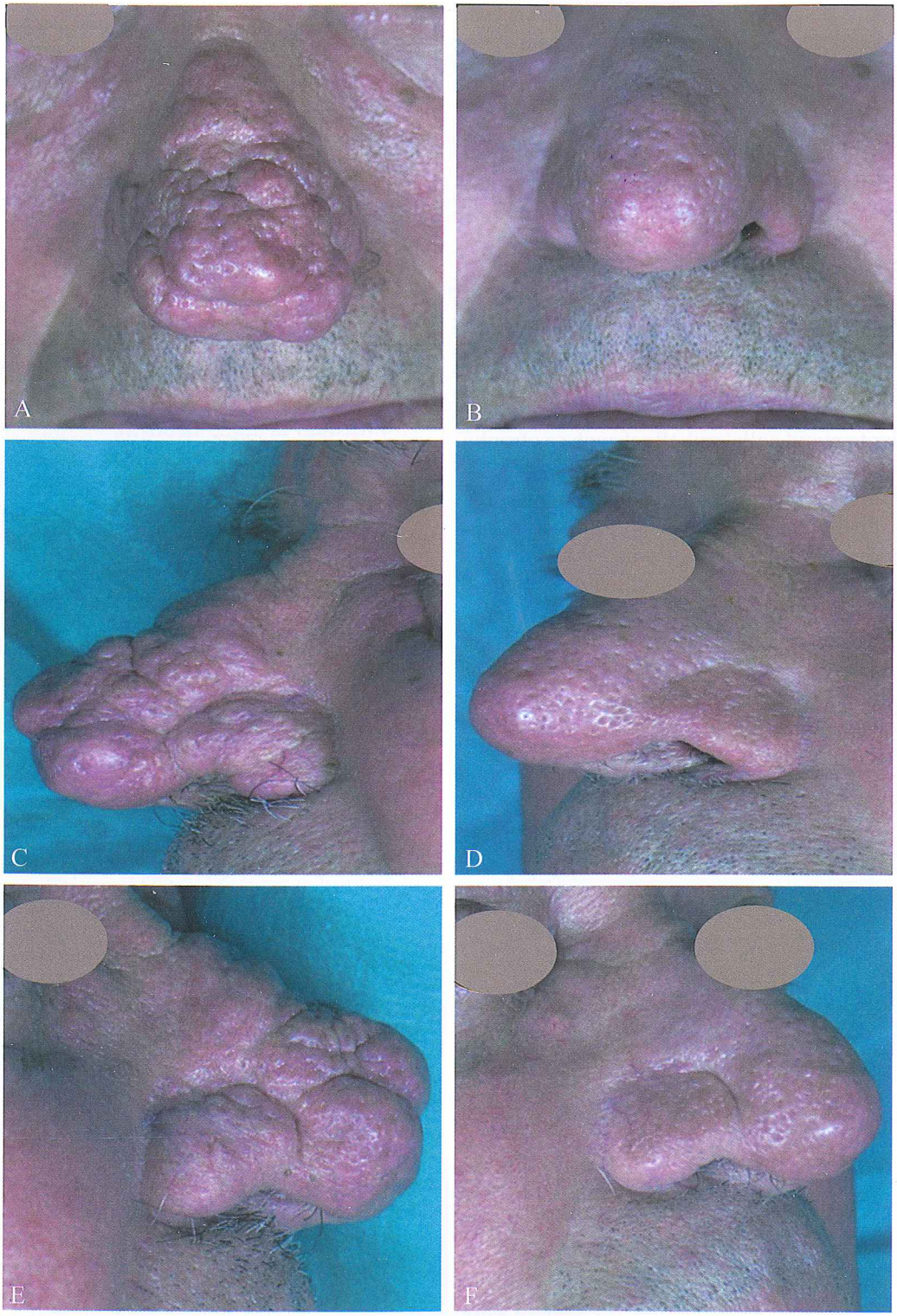


Figure 3.—First example: rhinophyma before treatment (A, C, E) and after five session of CO_2 laser (B, D, F).

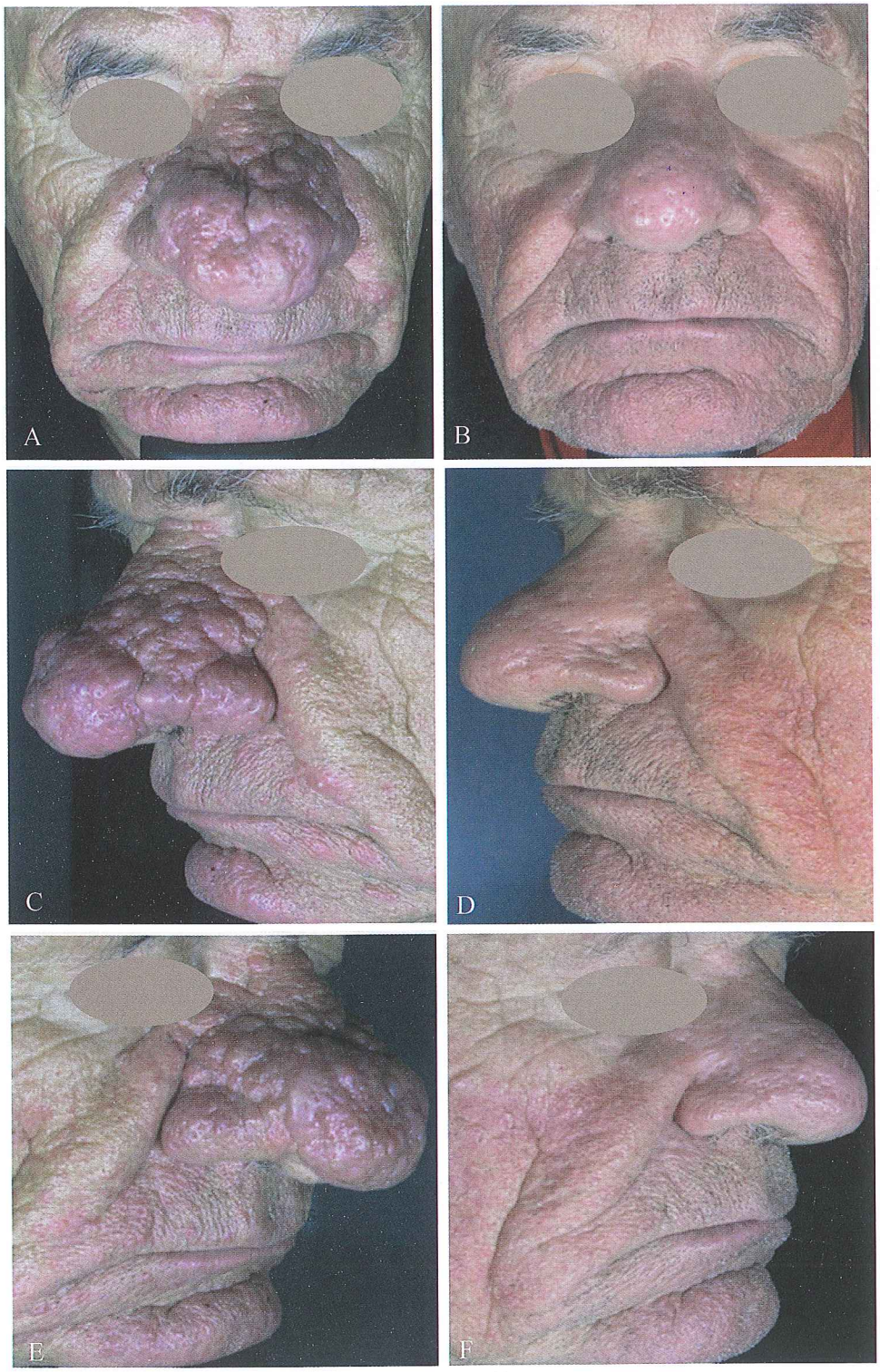


Figure 4.—Second example: rhinophyma before treatment (A, C, E) and after four session of CO_2 laser (B, D, F).



Figure 5.—Third example: rhinophyma before treatment (A, C, E) and after five session of CO_2 laser (B, D, F).

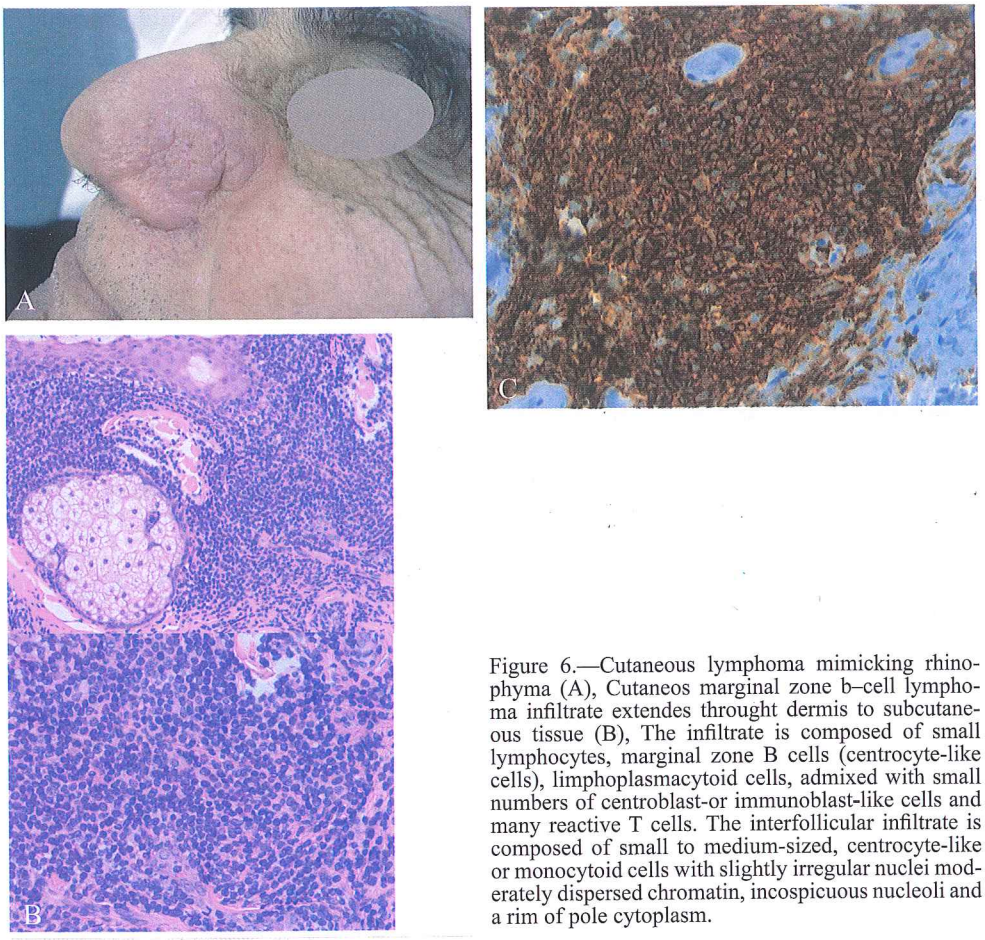


Figure 6.—Cutaneous lymphoma mimicking rhinophyma (A), Cutaneos marginal zone b–cell lymphoma infiltrate extendes throught dermis to subcutaneous tissue (B), The infiltrate is composed of small lymphocytes, marginal zone B cells (centrocyte-like cells), limphoplasmacytoid cells, admixed with small numbers of centroblast-or immunoblast-like cells and many reactive T cells. The interfollicular infiltrate is composed of small to medium-sized, centrocyte-like or monocytoid cells with slightly irregular nuclei moderately dispersed chromatin, incospicuous nucleoli and a rim of pole cytoplasm.

In the treatment of rhinophyma, it is fundamental to preserve follicular epidermal tissue in the deep layers of tissue where re-epithelization occurs.

The best approach permitting us to avoid this problem is CO_2 laser, which allows a bloodless operative field upon each treatment. In this way, we can also obtain a perfect visualization of the treatment area and decide to stop vaporization at the right moment.[15] More important, even patients with severe rhinophyma can be successfully treated with this method, as demonstrated by our study. Other important advantages of CO_2 laser are that it only requires local anesthesia, and has a short healing time.[16] In our study, re-epithelization of the nasal surface treated with CO_2 laser was obtained in a few (3-4) weeks. Usually if decortications are very deep, collateral effects may occur: we suggest to use a low power setting in a pulsed mode (DP) in order to avoid the scar formation and a "plastic nose" effect (Figure 7).

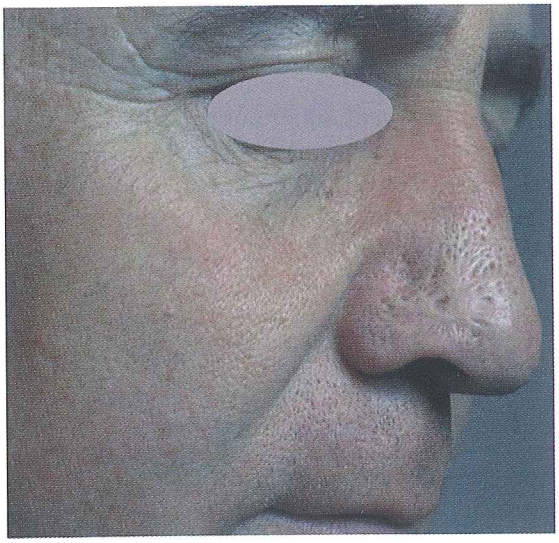


Figure 7.—An example of plastic nose effect after a deep CO_2 vaporization.

The CO_2 laser emits a wavelength absorbed by water, thus resulting in efficient evaporation and minimal thermal damage to closer tissue, offering a precise surgical tool for rhinophyma ablation leading to excellent cosmetic results with no scarring as seen in our study.

Our study, in fact, demonstrates that carbon dioxide laser allows a very careful nasal surface ablation and the remodeling of the hypertrophic areas, with an excellent cosmetic result, a very short healing time and virtually no side effects. CO_2 laser, as shown by our clinical results, can indeed be considered the gold standard therapy for rhinophyma, since it is a safe, efficient and reliable technique. One possible drawback in this application could derive from the experience which is required to achieve good results. In fact, even though this particular technique is widespread, not many physicians have the required skills to obtain such striking results.

The psychological rebound of patients with rhinophyma is another important aspect that we must take in consideration. Rhinophyma can carry a strong psychological impact due to its effect on one's personal appearance. Patients seek effective cures because of the unsightly appearance of nose enlargement. This condition can generate a lack of confidence and isolation, that can be remedied by a treatment able to give a greater quality of life even in the long term. Besides the psychological problems, this condition is often characterized also by functional negative consequences like obstruction in breathing and vision. The rhinophyma therapeutic correction must take the dignity of a relevant intervention which overshoots the simple cosmetic problems. Nowadays a laser operation through only four sessions allows us to limit breathing and vision troubles, as documented by the patients subjective evaluations.

Conclusions

In our series, CO_2 laser treatment revealed to be the most effective approach if compared with previous therapeutic options received by patients. Of course, further studies are needed to improve protocols and settings in this kind of application.

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Conflicts of interest.—The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.
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