

CASE REPORT

Rhinophyma: Carbon dioxide laser with computerized scanner is still an outstanding treatment

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ABSTRACT

The cosmetic deformity produced by rhinophyma is characterized by nodular hypertrophy of the nasal skin. A retrospective review and analysis of nine consecutive patients with moderate and major rhinophyma treated with scanned carbon dioxide laser was performed. A particular method of continuous scanner use is described. This report demonstrates excellent cosmetic results and no major postoperative complications or recurrence of the condition after 1 year of follow up for seven patients. Two more patients had been followed up for 1 month at the time this paper was written. Scanned carbon dioxide laser is safe and highly effective treatment for rhinophyma.

Key words: carbon dioxide laser, continuous wave, nasal hypertrophy, rhinophyma, rosacea, scanner.

INTRODUCTION

Rhinophyma is a rosacea variant, primarily affecting middle-aged or elderly Caucasian men. It is characterized by a progressive thickening of the nasal skin, which produces soft-tissue hypertrophy of the nose.¹ Morphologically, the nose appears deformed, with thickening and nodule formation. The surface is erythematous and telangiectatic with enlarged pores. The process affects mainly the lower two-thirds of the nose.² Treatment options for rhinophyma include surgical excision, electrocautery, cryosurgery or laser ablation, with newer technologies such as Er : YAG being increasingly used.^{3,4} Disadvantages associated with each of these treatment modalities have been described, such as excessive bleeding, dispersion of blood, postoperative pain and unsatisfactory cosmetic results.^{5,6} This study

evaluates the benefits of a particular method of scanned carbon dioxide laser therapy in the treatment of rhinophyma. This method is not a well-published technique in the treatment of rhinophyma at this time.^{7,8}

METHODS

A retrospective chart review and analysis of sequential clinical photographs were performed on nine consecutive patients who underwent scanned carbon dioxide laser treatment (Sharplan 40C with SilkTouch/FeatherTouch scanner; Sharplan/ESC Laser Inc, Allendale, NJ, USA) for rhinophyma from October 2002 to September 2008. All of the patients were Caucasian men aged between 49 and 84 years old. We categorized our patients into three categories,⁹ in which rhinophyma was classified as follows: minor rhinophyma, telangiectasias and mild thickening or textural change on the nose; moderate rhinophyma, thickening of the nose and early formation of lobules; and major rhinophyma, presence of both nasal hypertrophy and prominent lobules. Three patients had major rhinophyma and the remaining six patients had moderate rhinophyma.

All laser procedures were performed by a single operator. After informed consent, all patients received local regional nerve blocks consisting of xylocaine 1% with adrenaline 1 : 100 000 to anaesthetize the surgical area. All patients required only one procedure. On average, each procedure took less than 30 min with the carbon dioxide laser with scanner system. Seven patients were on concurrent antibiotics for treatment of their rosacea.

The settings used for the Sharplan 40C laser in continuous SilkTouch mode were at 20–30 W with a 1.2–3.0-mm spot size for debulking. (Table 1) The endpoint in the rhinophymatous area was ablation to achieve correction of deformity at the same time as leaving a honeycomb appearance of residual sebaceous glands to allow for re-epithelialization. There is continuous vacuum suctioning of the smoke during the procedure via a suction exhaust

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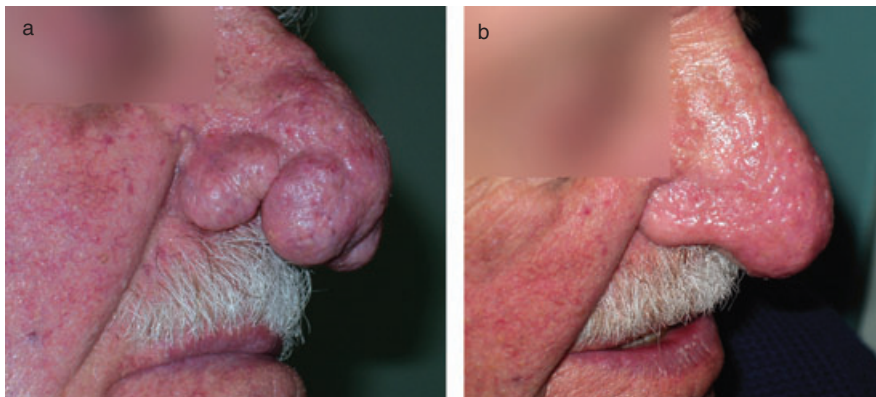
Abbreviations:

Er : YAG Erbium : yttrium–aluminium–garnet

Table 1 Data summary of patients with rhinophyma treated with carbon dioxide laser (debulking component of treatment)

Patient	Age (years)	Rhinophyma severity	Laser settings			Complications (up to 1 year)	Other treatments
			Spot size (mm)	Power (W)	Mode [†]		
A	84	Major	1.2	30	SilkTouch	Nil	
B	49	Moderate	3	30	SilkTouch	Nil	Vascular laser treatment for erythema
C	71	Moderate	3	20	SilkTouch	Nil	
D	57	Moderate	3	30	SilkTouch	Nil	
E	69	Moderate	3	30	SilkTouch	Nil	
F	62	Moderate	3	30	FeatherTouch	Nil	Touch-up treatment for nasal tip depression
G	62	Moderate	3	30	SilkTouch	Nil	
H	68	Major	3	30	SilkTouch	Nil [‡]	
I	72	Major	3	30	SilkTouch	Nil [‡]	

[†]Continuous scan. [‡]No complications at 1-month review.

**Figure 1** Patient A.

system built into the distance tip. The procedure is completed with a single blending pass to the non-rhinophymatous areas within the cosmetic unit. Parameters used were FeatherTouch mode at 22–40 W with a 5–6-mm spot set to single scan.

The nose was dressed with a hydrocolloid fluid absorbent wound dressing (DuoDERM Thin) changed daily, allowing healing by re-epithelialization. Patients were followed up over the next few weeks and for up to 1 year. Sequential photographs were taken before and after treatment.

RESULTS

The nine patients were followed up in clinic and re-epithelialization was observed to take place within 2 weeks. There were no postoperative complications such as bleeding, pain or infection (Table 1). None of the seven patients followed up for 1 year experienced recurrence of the condition. Two patients had only been followed up for 1 month at the time this paper was written. Clinically good nasal contour and colour, ala symmetry and minimal scarring were achieved in all cases. All nine patients were very satisfied with the final cosmetic results. Four patients (patients A, H, I and F) are shown with pre- and postoperative views in Figures 1–4.

Two patients required further treatment of their nose. Patient F required a touch-up treatment at the nasal tip for a slight depression. He had blending of the edges of the depression in continuous scan FeatherTouch mode at 30 W with a 5-mm spot size. Patient B had vascular laser treatment 6 months later for erythema.

DISCUSSION

The carbon dioxide laser was reported in 1980 for the treatment of rhinophyma.¹⁰ It offers excellent precision, marked haemostatic effects, minimal complications and satisfactory cosmetic results. Carbon dioxide laser emits light energy in the infrared portion of the spectrum at 10 600 nm.¹¹ It targets intra- and extracellular water, resulting in water vaporization and tissue loss. It also produces effective haemostasis for blood vessels up to 0.5 mm in diameter.¹¹ Current-generation carbon dioxide lasers limit residual thermal injury in the skin by producing high-energy laser light with tissue dwell times shorter than the thermal relaxation time of the epidermis. Pulsed and scanned carbon dioxide laser systems have been developed to limit carbon dioxide laser dwell times. Our Sharplan carbon dioxide laser with a SilkTouch/FeatherTouch scanner generates a continuous beam of laser energy that moves rapidly across

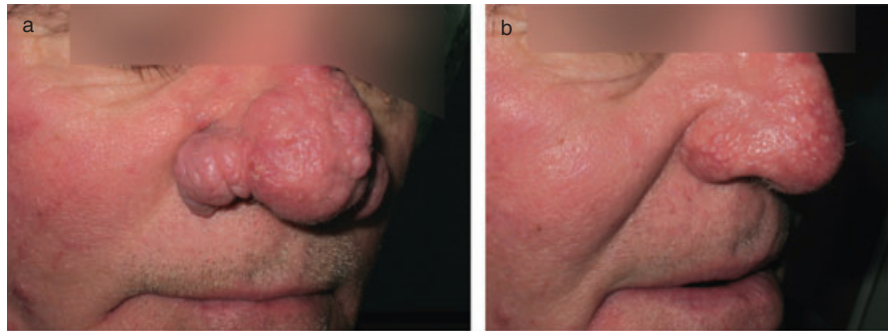


Figure 2 Patient H.

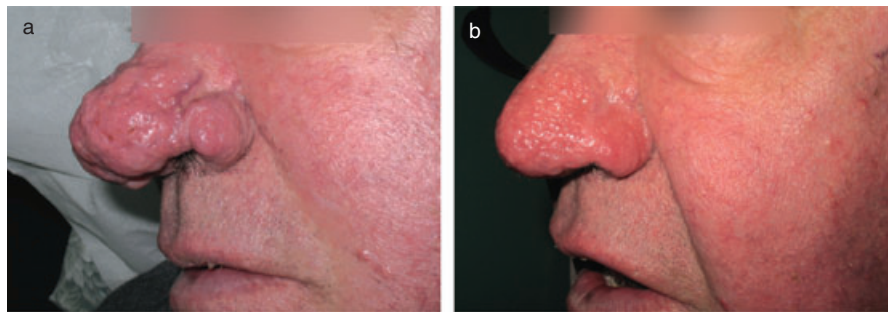


Figure 3 Patient I.

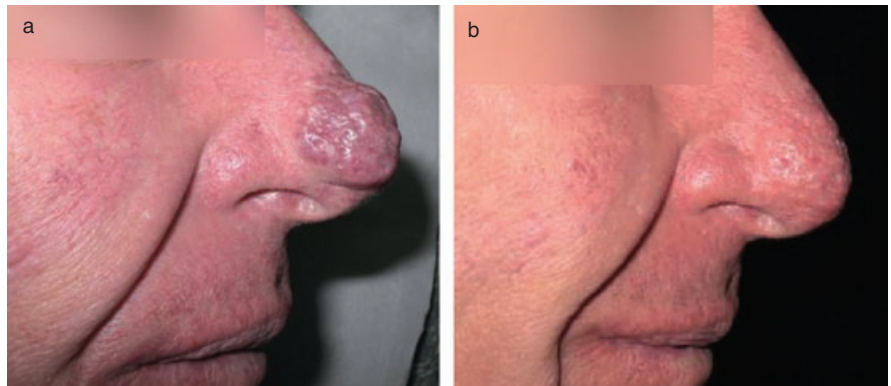


Figure 4 Patient F.

an area of skin with the aid of the computerized scanner.¹² The Sharplan carbon dioxide laser focuses to a 0.1-mm point in cutting mode, but the use of the scanner allows the 'cutting point' to widen to up to 3 mm in diameter, acting like a broad-based drill bit. The technique is best described as circular painting, which sculpts the nose to the desired contour. This technique is fast because it does not need multiple passes or wiping as the tissue appears to vaporize completely with treatment. Without the use of the carbon dioxide laser in continuous scanned mode, treatment is much slower and requires ongoing wiping of white powdered surface debris. Likewise, the use of carbon dioxide laser in continuous wave mode without a scanner also requires wiping between passes and is probably associated with a wider zone of thermal damage.

Power settings of the scanned carbon dioxide laser vary somewhat depending on how quickly the operator works. Slower hand movement necessitate lower wattage, whereas quicker hand movement allows use of higher wattage. We found our settings (Table 1) to be optimal with the laser we used. The endpoint was a honeycomb appearance with reasonable shape and expressible sebum. Expressible sebum is useful for ensuring that the ablation is not carried out too deeply.⁴

Classification of the severity of rhinophyma has been varied,^{9,13,14} and has been based on the extent of the disease, descriptive analysis or how extensive the disease is across the regions of the nose. These have not been useful for effective comparison of pre- and post-treatment photos. We used our chosen classification⁹ mainly as an indication of

the degree of rhinophyma we selected for treatment with our carbon dioxide laser.

Reported side-effects of carbon dioxide laser include erythema, hypopigmentation, hyperpigmentation, haemorrhage, fistula formation and notching.¹⁵ One of our patients experienced a small nasal tip depression that was treated with blending of the edges to an acceptable contour. Another patient had treatment of nose erythema using vascular laser with good effect 6 months later. Our patients demonstrated re-epithelization over 2 weeks, consistent with the current literature.¹⁶ Erythema, which has been reported to persist for up to several months, was not a concern for most of our patients given the remarkable improvement they had gained, and our patients were very pleased with their improvement.⁹ None of our seven patients experienced a recurrence of rhinophyma in the 1-year follow up, consistent with other studies of up to 10 years follow up.^{9,15}

Older techniques that are still used include decortication, which involves subtotal excision, leaving the base of sebaceous follicles to aid in re-epithelization. Decortication can be performed by scalpel, dermatome, dermabrasion, Weck blade or electrocautery.^{17,18} The main problem with some of these sculpturing techniques is that bleeding leads to poor visualisation, making tissue removal much less precise.¹⁸ Deep dermabrasion can result in significant scarring¹⁹ and there may also be a sharp demarcation surrounding the edges of the treatment site and adjacent normal tissue, leaving a poor cosmetic result.^{17,20} Electrocautery can solve the bleeding problem and has been reported to produce similar results to carbon dioxide laser treatment.²¹ However, electrocautery leaves a wide zone of thermal-induced tissue destruction, which can result in poor texture or hypertrophic scarring.^{21,22} Carbon dioxide laser has the advantage of limited thermal effect, reducing the risk of scarring. There is also less postoperative pain, probably due to the ability of the carbon dioxide laser to seal nerve endings.²²

In recent years, Er : YAG lasers have been increasingly reported in the literature, along with new dual-mode Er : YAG lasers.^{3,4,23} Er : YAG lasers have been reported to have the advantage of more precise ablation with minimal residual thermal damage and less severe and shorter duration of side-effects (e.g. erythema). However, Er : YAG lasers have less spectacular results and poor coagulative effect. Er : YAG lasers tend to cause heavier bleeding with decreased visibility.²⁴ In comparison, the carbon dioxide laser has been found to provide excellent haemostasis during resection, maximising visualisation with minimal complications,¹⁵ similar to our experience. We do note however, that lasers are more capital intensive and result in higher fees compared with other physical techniques, but believe that the ease of use, accuracy and precision the lasers offer justify the increased cost.

Our patients demonstrate excellent results with scanned carbon dioxide laser treatment. Scanned carbon dioxide laser may now be considered an older technology, but, in our opinion, it is well-established, reliable, fast, and remains an outstanding treatment.

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