

Clinical observation of superpulsed carbon dioxide dot matrix laser in the treatment of superficial acne scars

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ABSTRACT. *Objective: To analyze the clinical effect of super-pulsed carbon dioxide dot matrix laser in the treatment of superficial acne scars. Methods: the study of the main object choice between January 2018 and December 2019 treated in our hospital during the period of 228 patients with acne superficial scar, all patients were treated for a super lattice co2 laser pulse and effectiveness in the treatment of patients with analysis after treatment, the treatment of patients with safety and psychological state, analysis the application value of the treatment. Results: The results showed that in terms of skin recovery, the skin recovery at 3 months after the operation was significantly better than that at 1 month after the operation, indicating that the super-pulsed CARBON dioxide dot matrix laser treatment could effectively ensure the treatment effectiveness and enable the patients to recover a better skin state stably. In terms of complications, the complication rate of the patients at 3 months after the operation was significantly lower than that at 1 month after the operation, which confirmed that the hyperpulsed CARBON dioxide dot matrix laser treatment regimen was safe and gradually became stable with the advance of the recovery time of the patients. In terms of the treatment satisfaction, the overall satisfaction of the patients reached 95.2%, indicating that the vast majority of patients have a relatively high recognition of the treatment method of SUPER-pulsed CARBON dioxide dot matrix laser, and the appearance improvement of the patients is generally good. Conclusion: The hyperpulsed carbon dioxide dot matrix laser has a significant effect on the treatment of superficial acne scars, and has a good safety performance, which enables the patients to maintain a stable psychological state and face the prognosis and recovery stage correctly. So this regimen can also be useful for severe scarring or acne scars with pits.*

KEYWORDS: *Superpulsed CARBON dioxide dot matrix laser; Superficial scars of acne; The curative effect*

1. Introduction

With Acne scars on the face are very common and can have a significant impact on the patient's state of life and psychology. After the formation of acne, some

patients will use their hands to squeeze or take some incorrect coping measures, resulting in local skin damage, and the collagen of the dermis is also adversely affected. Therefore, for superficial acne scars, active treatment can help patients reduce skin damage on the one hand, on the other hand, it can also help patients maintain a good psychological state. The core of superpulsed CARBON dioxide dot matrix laser therapy is to control the width and depth of the micro-thermal damage area of the skin, and to ensure the high strength effect on the local skin by using the parallel repair function of the skin around the dot matrix micropores. Therefore, this study will also focus on the corresponding treatment methods for exploration and analysis. The results are reported as follows.

2. Materials and Methods

2.1 The general information

The main subjects of this study were 228 patients with superficial acne scars who were treated in our hospital from January 2018 to December 2019. All patients received hyperpulsed CARBON dioxide dot matrix laser treatment. Among the patients, 105 were males and 123 were females, aged 19-38 years, with an average age of (25.9 ± 0.6) years.

Inclusion criteria: The site and severity of bilateral lesions in all patients were basically consistent, and all patients and their families were aware of the main content of this study and signed the informed consent.

Exclusion criteria: patients who had received facial laser or other surgical treatment in the past 6 months; Patients with active skin diseases; Patients with diseases of the blood system or other medical diseases; Pregnant women.

2.2 Methods

All patients were treated with 10600nm ultra-pulse CARBON dioxide dot matrix laser. Surface anesthesia was performed with compound lidocaine 1h before surgery and the facial burning sensation that might occur during the treatment was reduced. After 1h, patients were asked to use facial cleanser to clean and disinfect all the treatment areas. The dot matrix coverage method was determined according to the size and specific state of the treated skin lesions, and the facial scar area was scanned uniformly. Immediately after the operation, ice cubes were used for ice compress for more than 30 minutes, in order to reduce the degree of postoperative thermal damage. For external medication, mebo meBO was applied twice a day for 10 days. Patients should avoid excessive sun exposure for six months after treatment and consider using moisturizers or sunscreen for protection and prevention.

2.3 Observed index

In postoperative 1 month and 3 months after treatment for patients with skin conditions to determine, is divided into *, valid and invalid, let patients under the condition of the same photographic retained, comparing the related photos by two dermatologists that does not participate in the treatment in accordance with the ECCA evaluation method for the treatment of patients with follow-up results were analyzed, and the four points and select rating scale. Significant effect: 3-4 points, that is, the patient's skin has been significantly improved, the degree of scar improvement is more than 50%; Effective: 2 points, good skin improvement, scar improvement index below 50%, more than 25%; Invalid: 1 and 0 points, no significant improvement in skin, scar improvement less than 25%.

In terms of the safety of treatment, complications and adverse reactions occurred in patients were used as the criteria, including severe pain, bleeding and postoperative erythema. At the same time, the edema and pigmentation time of the patients were counted during the whole treatment period, so as to understand the possible adverse reactions of the patients and make corresponding records.

In terms of patient satisfaction, it is divided into very satisfied, satisfied and dissatisfied, and mainly based on the psychological state and appearance evaluation results of the patients.

2.4 Statistical treatment

SPSS18.0 statistical software was selected to analyze the data of this study

3. Results

3.1 Skin recovery

The results showed that in terms of skin recovery, the patients' skin recovery at 3 months after the operation was significantly better than that at 1 month after the operation, indicating that the super-pulsed CARBON dioxide dot matrix laser treatment could effectively ensure the treatment effectiveness and enable the patients to recover a better skin state stably. See table 1 below for details.

Table 1 Skin conditions of patients 1 month and 3 months after surgery (N, %)

Period of time	Numbers	Very effective	Effective	Invalid	Total effective rate
1 month after surgery	228	107	82	39	189(82.9)
3 month after surgery	228	135	84	9	219(96.1)

3.2 Complications and adverse reactions

In terms of complications, the complication rate of the patients at 3 months after the operation was significantly lower than that at 1 month after the operation, which confirmed that the hyperpulsed CARBON dioxide dot matrix laser treatment regimen was safe and gradually became stable with the advance of the recovery time of the patients. The specific data are shown in Table 2 below.

Table 2 Complications and adverse reactions (N, %)

Period of time	Numbers	Severe pain	Bleeding	Postoperative erythema	Complication rate
1 month after surgery	228	6	8	2	16(7.0)
3 month after surgery	228	0	2	3	5(2.2)

3.3 Satisfaction

In terms of the treatment satisfaction, the overall satisfaction of the patients reached 95.2%, indicating that the vast majority of patients have a relatively high recognition of the treatment method of SUPER-pulsed CARBON dioxide dot matrix laser, and the appearance improvement of the patients is generally good. The specific data are shown in Table 3 below.

Table 3 Data of patients' treatment satisfaction (N, %)

Period of time	Numbers	Very satisfied	Satisfied	Not satisfied	Satisfaction
After surgery	228	128	89	11	217(95.2)

4. Discuss

Modern people have higher requirements for beauty. Superficial scar after acne is a stable and mature scar, and usually the appearance of the patient's face will be affected by the change of pigment or uneven surface [1]. From the perspective of treatment options, the main advantages of ultrapulsed CARBON dioxide dot matrix laser therapy are that it can reduce the injury to patients, with less eschar, and patients are less likely to have postoperative complications. The effect of superficial scars on patients includes not only the physical beauty, but also the psychological state of patients. For example, many patients will have bad emotions due to appearance, which will affect their social behaviors or even career choices [2]. According to the data results of this study, the patients showed a good level in terms

of postoperative treatment effectiveness and skin recovery, as well as satisfaction and complications, indicating that this surgical treatment regimen can pay attention to the remodeling and reconstruction of dermal collagen in the repair of acne scars. When the array of tiny beams of light ACTS on the skin area of the patient, a number of microthermal damage areas represented by columnar structures can be formed, and around each microthermal damage area, awakened thermal solidification zones and thermal damage zones can also be formed. Normal peripheral tissue that is not damaged ensures that the patient's skin can be repaired quickly after treatment. After moisture absorption of laser energy itself can produce different levels of heat damage and the patients with radiation skin can generate only a very slight skin necrosis change, heat energy density in the corresponding laser can penetrate the skin form under the aperture, start the body is not yet very procedural recovery process, let patients with scar, effectively restore trauma cases. Therefore, under the promotion and action of this treatment mode, laser beams arranged in a lattice allow skin to be reconstructed, and the normal skin between laser beams can also enable rapid healing of microscopic wounds and ensure the safety of treatment, which is also an effective embodiment of the principle of focal photothermal action [3].

At present, with the development of technology, the common laser treatments include stripping lattice laser and non-stripping lattice laser. Exfoliative dot matrix laser therapy requires multiple treatments to achieve relatively satisfactory results, although postoperative adverse reactions are generally mild. In contrast, exfoliated lattice laser is dominated by super-pulsed carbon dioxide laser, which is the treatment scheme adopted in this study [4]. In many studies, it has also been confirmed that there is a close relationship between preoperative and postoperative efficacy evaluation results and treatment plan, which can reasonably control the thermal coagulation effect and stripping effect, which can not only effectively reduce the treatment frequency of patients, but also maximize the therapeutic effect and become an effective means of acne scars. Except treatment, of course, for the patient care protection measures and the side effects is very important to control work, part of drug control and skin cooling method is still the main scheme is to reduce the complications, such as to reduce the degree of postoperative pain in patients with heat and reduce unnecessary damage, will choose ice compress clean washing a face, or other methods to speed up the repair of skin restore skin continuity [5].

To sum up, the use of super-pulsed carbon dioxide dot matrix laser in the treatment of superficial acne scars has a significant effect and a good safety performance, which enables patients to maintain a stable psychological state and face the prognosis and recovery stage correctly. So this regimen can also be useful for severe scarring or acne scars with pits.

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