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Acne Scar Management by Fractional CO_2 Laser

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Abstract: Background: Acne scars are one of the most common problems following acne vulgaris. Despite the extensive list of available treatment modalities, their effectiveness depends upon the nature of the scar. Ablative lasers had been used to treat acne scars; one of them is the fractional CO2 laser. The aim of this study is to evaluate the outcome of fractional CO2 laser in the treatment of acne scars. Methods: Since January 2010 to June 2013, using 10600 nm fractional CO2 laser beams, the acne scar of 400 patients, 188 males and 212 females, mean age of 34 years, have been treated and classified according to severity into four grades following Goodman and Baron classification. Each patient underwent 3-5 sessions once monthly. The mean laser exposure time was 15 minutes, mean operative time was 1-1.5 hours, no hospital stay and the treatment coarse lasted 3-5 months. Patients were followed up for about one year to evaluate the success of the procedure. Results: Investigators and patients graded the improvement on a scale (0=no improvement to grade1 0-25%, grade 2, 25-50% ,grade 3 50-75%,grade 4 more than 75%. Both investigators and patients gave mean improvement scores in the range of 50% to 75% for scar depth, scar margins beveling, better color match, texture, skin tightness and overall improvement of the patients well looking. The degree of improvement increased with each treatment session and continued to increase between the 1-month and 3-month after the last treatment. Conclusion Fraction ablative resurfacing seems to hit a sweet spot between the minimal benefits of traditional nonablative laser treatment and the considerable downtime and complications of ablative resurfacing.

Introduction

Patients with scars usually seek treatment for their removal but are mostly concerned about the prolonged recovery, short-lived results, and/or ineffectiveness of available therapies (Wichai Hongcharu, et.al,.2000). Many adults occasionally develop mild, isolated acne lesions. Noninflammatory and mild inflammatory acne usually heals without scars. Moderate to severe inflammatory acne heals but often leaves scarring. Scarring is not only physical; acne may be a huge emotional stressor for adolescents who may withdraw, using the acne as an excuse to avoid difficult personal adjustments.

Acne vulgaris is a skin disease affecting more than 80% of young people. Propionibacterium acnes and sebum secretion play major roles in the pathogenesis of acne (Balaji Adityan, et.al,. 2009). It has a complex etiology, involving abnormal keratinisation, hormonal function, bacterial growth, and immune hypersensitivity (Guy F Webster 2002). It is a disease of the pilosebaceous units, clinically characterized by seborrhea, comedones, papules, pustules, nodules and, in some cases, scarring (Balaji Adityan, et.al,. 2009).

There are numerous forms of acne scarring and it is important to be aware of these patients as patients who are developing scarring merit the early treatment (Alison M. Layton 2001).

Topical and systemic antibiotics are mainstays for treatment of acne, but the success rate varies in part due to the gradual resistance to antibiotics. Sun exposure has a well-known beneficial effect on acne, which is not the case for ultraviolet exposure (Wichai Hongcharu, et.al,.2000).

Conventional carbon dioxide (CO_2) and erbium: yttrium-aluminum-garnet (Er:YAG) lasers were considered as the gold standard for skin laser resurfacing. Despite superior clinical outcomes, this particular modality has been associated with lengthy recovery time and high risk of side effects and complications, particularly in patients with darker skin types (Young Ji Hwang, et.al,. 2013).

The newly developed ablative fractional photothermolysis laser (FL) was designed to minimize these shortcomings of ablative laser while maintaining its clinical efficacy (Chapas AM, et al.2008). Ablative FL results in a microscopic pattern with spatial separation of normal tissues by thermally-affected epidermal and dermal columns. Immunohistochemical studies have revealed that during this peculiar process of wound healing, the induction of epidermal heat-shock protein and collagen remodeling occurs, lasting up to 3 months post-ablative FL treatment in vivo (Hantash BM, et al. 2007).

Various adverse effects, however, such as herpes simplex virus (HSV) outbreak, bacterial infection, acneiform eruption, erosion, and postinflammatory hyperpigmentation (PIH) are being reported after ablative FL treatment (Alexiades-Armenakas et.al,. 2008).

The aim of the study is to evaluate the outcome of fractional CO_2 laser in the treatment of acne scars.

Materials and methods:

Four hundred patients have been enrolled in this study having acne scars ,seeking treatment for them ,188 males and 212 females (142 patients were light, 198 were white, 53 dark Asian and 7 were dark black), with a mean age of 34 years, in the period between January 2010 to June 2013. Collection of data has been done in (Al Bazzaz beauty clinic.)

Full dermatological history has been taken and every patient underwent full dermatological evaluation:, the patient expectation were studied also. The severity was classified according to Goodman and Baron into 4 grades (grade 1: macular or mildly atrophic; grade 2: moderately atrophic; grade 3:punched out or linear-troughed severe scars; grade 4 hyperplastic papular scars) (Goodman GJ, Baron JA., 2007). Special attention was paid to the shape, depth, edge, color, surface area, and density of the scars ,these points were regarded as a measuring parameters to evaluate the outcome of our procedure.

Seventy five of the patients were grade 1, 103 were grade 2, 133 patients were grade 3 and 89 were grade 4.

The exclusion criteria:

Absolute contraindications

-Active bacterial, viral, or fungal infections
-Unrealistic expectations
-Uncooperative patient

Relative contraindications

-Poor general health
-Oral isotretinoin (Accutane) use within previous 6 months
-Fitzpatrick skin phototypes 5-6
-Reticular dermis-level resurfacing procedure within preceding 2-3 months
-Unwillingness to accept the possibility of postoperative erythema or hypopigmentation
-Excessively thick or thin skin
-Collagen vascular disease
-Human immunodeficiency virus (HIV) or hepatitis C infections
-Tendency for keloid or hypertrophic scar.

Preoperative Details

We have selected suitable patients for carbon dioxide laser resurfacing to achieve the desired results, and attention was paid to the skin type and degree of photo damage.

All patients had a mean of three sessions of fractional CO_2 laser therapy on monthly manner.

Intraoperative Details

Laser safety: as far as carbon dioxide laser can cause fire all flammable objects been removed from the field of surgery, eye protection for patient, physician, and assistants were worn ,by using proper evacuation of the vaporized tissue plume to reduced the chance of airborne transmitted diseases.

For skin preparation: patient's face has been cleaned with antibacterial soap either by using alcohol or providence iodine, then we cover periphery of face with wet cloths.

Anesthesia choices

Topical anesthetics (e.g., eutectic mixture of lidocaine/prilocaine [EMLA]) applied for one hour before the laser session in a closed application (a sheet of teflon was put on the face to ensure complete absorption of the anesthetic drug).

The pain has been decreased to a tolerable degree, although some patients continued to feel severe pain.

Fractional Carbon dioxide laser resurfacing technique:

Treatment parameters are set according to carbon dioxide laser device and are individualized for each patient according to:

1. the condition treated,
2. skin type, and
3. the goal to be achieved.

We used MOR-XEL CO_2 laser device in stamp mode Spot size 70 micrometers

Each one square centimeter contains 49 PIXILS, also we used copro2 CO_2 laser device with scanner mode (the shape of the scanner pattern was optional, sometimes we need square or rectangular or even circular).

Using Morexil device our parameters were:

-The fluence were 33-74 mj/cm2

-Pulse duration 500-700 microseconds

-Exposure time was 150-250 ms.

For copro2 device the fluence was between 8-15 mj/dot (each dot = 200 micrometer in diameter).

The density of the pixels adjusted according to the individual variations of the severity of the scars.

Generally, we used MOR-XEL CO_2 in the mild and moderate severity patients as far as the dot size is small that will give quick down time and minimal side effects, therefore they are best for students and working patients that can do their sessions in the weekend.

Also, we used morexil for dark skinned patients. For severe cases we used copro scanner type as far as it gives high energy and large spot size that is to say the necrosis zone will be larger than that of Morexil.

Using two different modalities of the same laser type enabled us to manage all types of acne scars also all skin types including dark black patients. By achieving tissue vaporization in a single laser pass, Pulse stacking leads to cumulative thermal injury to the skin.

Generally, the first laser pass results in red erythematous area with minute whitish spots and also we notice a vapor coming out indicating ablation process. After the first pass, rehydrate skin with moist saline-soaked gauze, remove debris using gentle rubbing, and then wipe treated area using dry gauze.

Perform second pass in the same manner as the first pass; however, pulses may be oriented at 90° to the direction used for the first pass.

In general, a third pass or subsequent passes can be applied more selectively to areas of advanced photo damage or scarring (shoulder of acne scars), the relationship between number of laser passes and tissue ablation/thermal damage is not linear. The first laser pass significantly ablates more tissue than the second or subsequent passes; an ablation plateau is reached in 3-4 passes, However, thermal damage is cumulative with each additional laser pass, resulting in a wider zone of necrosis.

Laser resurfacing is performed in a systematic fashion, beginning on the forehead and proceeding down the remainder of the face. Eyelid resurfacing often is performed last because eyelids are treated at lower pulse settings and densities and require additional care to avoid burning the eyelashes. Resurfacing of a single area alone generally is not advised to avoid sharp demarcations. One alternative is to perform carbon dioxide laser resurfacing on the desired area, then treat surrounding areas with a less aggressive parameters of the same CO_2 laser but with one or two passes only.

Feathering of margin is done between resurfaced and nonresurfaced skin edges to prevent demarcation lines. Treating the band of skin between the resurfaced and nonresurfaced skin at lower fluences accomplishes the desired blending.

Laser resurfacing endpoints are as follows:

1. When the treated area becomes whitish to light gray in color.
2. When the densities of the pixels are enough to cover the bottoms' of the scars

As with any resurfacing modality, depth control is essential in carbon dioxide laser skin resurfacing to avoid potential complications and obtain best results.

Improvement of acne scars with minimal downtime and without serious complications. We used higher energies for deeper scars and lower energies in areas without scars and on thin skin.

The mean laser exposure time was 15 min., mean operative time 1-1.5 hours, no hospital stay and the treatment coarse last 3-5 months. Patients were followed up for about one year to evaluate the success of the procedure.

Post-operative managements

Patients were advised not to be exposed to any sort of UV radiation to prevent hyperpigmentation for 5-7 days.

Not to wash their faces for 24h to prevent water from in contact with the wounds of the laser. Local antibiotic ointment mixed with betamethason ointment and bepanthene applied to the treated area three times daily. Washing by tape water and non irritant soap started from the 2nd day postoperatively. Sun protection applied after shedding of all scales, and whenever the patient start his outdoor activities.

Results:

Investigators and patients graded improvement on a scale (0=no improvement; 4=75% improvement). Both investigators and patients gave mean improvement scores in the 50% to 75% for scar depth, scar margins beveling, better color match, texture, skin tightness and overall improvement of the patients well looking. The degree of improvement increased with each treatment and continued to increase between the 1-month and 3-month follow-up visits after the last treatment.

1- Scar depth:

After following up the patients for one year, the depth of the scar has been improved in 55 patients by 30-40%, in 96 patients by 40-50%, in 190 patients by 50-60%, in 35 patients by 60-70% and in only 24 patients by 70-80 %.

So Objective photographic assessment demonstrated a mean reduction in scar depth of 60%. The most severe acne scars that were treated with the highest energies achieved the best improvement (60%–75% at 3 months after last treatment (Table 1).

Table (1): The percentage of improvement in the scar depth.

Number of patients	% of improvement of scar depth
55	30-40
96	40-50
190	50-60
35	60-70
24	70-80

2.Scar shape:

All patients had better scar shape that changed from un even to more homogenous even shape

3.Scar edge:

Deep scars with sharp edges respond less to laser therapy ,shallow scars with sloped edges respond better and the edges flatten more

4. Scar color:

Dark scars become lighter ,hypopigmented scars didn't improve ,but hyper pigmented scars faded gradually after each session, the lighter the skin ,the better the scar color match.

5.The surface area :

The surface area involved in scars decreased as the shallow, fine scars disappears and the wide ,deeper scars becomes less apparent so the appearance of the skin to the looking person seems less affected. .

6. The scars density:

The density became less mostly by the disappearance of about 50% of the scars at the end of three months after the last session.

Discussion

The depth probably is the most important aspect that predicts the improvement in acne scars but the studies on histology have little uniformity in terms of tissue used, processing and stains used. The variability of the laser setting (dose, pulses and density) makes comparison of the studies difficult. It is easier to compare the end results, histological depth and clinical results (Kabir Sardana, et.al,. 2012).

Following up the patients after treatment showed improvement in the depth of the scar in large number of patients by 60%,which was also been found in other studies. Chapas and his teamwork found that the improvement ranged between 43% to 79.9% with a mean level of improvement of 66.8% (Anne M. Chapas , et.al,. 2008).Other researchers found that the clinical improvement may reach 90% (Tina S. Alster , et.al,. 2007).

As has been found by this study the maximum improvement appeared in 24 patients (70-80%), while 190 showed 50-60% improvement. Other research reported that their patients' self-assessed degrees of improvement were as follows: excellent improvement in eight patients (30%), significant improvement in 16 patients (59%), and moderate improvement in three patients (11%) (Hyoun Seung Lee, et.al,. 2008).

Regarding the scar color, this study found that the hypo-pigmentation did not improve, a result which is different from that achieved by Glaich and his team whose laser treatment revealed

improvements of 51% to 75% in hypopigmentation in six of seven patients included in their study (Adrienne S. Glaich, et.al,. 2007), and this may be due to the difference in the wavelength or type of laser used .Other study also reported , good improvement in fine lines, mottled hyperpigmentation, sallow complexion, tactile roughness, and global score (Kee Lee Tan , et.al,. 2008).

Nearly hundred percent of the patients shows decrease in the volume, surface area and improvement in the shape of the scar .Other study which was done by Manuskiatti and his team showed that 62% of patients rated the improvement of their scars by at least 25% to 50% after 6 months of treatment and this percent had been increased after 6 months follow up (Woraphong Manuskiatti, et.al,. 2010). The rapid improvement was shown after 3 months of treatment only as reported in a study which was done by Walgrave and her coworkers as twenty-three out of 25 subjects sustained clinical improvement in the appearance of acne scarring at the 3-month follow-up visits according to study investigator quartile improvement scoring. Subjects also had improvement in their overall appearance, including pigmentation and rhytides (Susan E. Walgrave, 2009).

Actually using the fractional CO_2 laser, atrophic scars generally improve by 50–80%. It vaporizes both the epidermis and papillary dermis to 20–60 μm in depth. The visible light lasers, mainly the 532-nm (green) and 585-nm (yellow) lights, are strongly absorbed by oxyhemoglobin and melanin in the blood vessels of the superficial dermis. It has been theorized that the heating effects in these skin layers triggers production of certain growth factors and inflammatory mediators into the interstitium, followed by stimulated fibroblastic activity. The effective tissue repair mechanisms initiated by these fibroblasts lead to skin remodeling and tightening (Tahir Jamil Ahmad, et al., 2012). So Fractional deep dermal ablation improves moderate to severe acne scarring. The added benefit is a considerable reduction both in downtime and risk of complications when compared to traditional CO_2 ablative resurfacing techniques (Susan E. Walgrave, 2009).

Although many studies give proof for the efficacy and safety of fractional photothermolysis, there is considerable debate about the long-term efficacy of these lasers. in this study the overall improvement was 50-57%. Oritz et al. assessed the long-term outcomes in ten subjects previously treated with fractional CO_2 resurfacing for treatment of acne scarring and photodamage who returned for long-term follow-up visits at 1 and 2 years, respectively (Ortiz AE, et.al,. 2010). The subjects maintained 74% of their overall improvement at their long-term visits compared with 3-month follow-up visits.. It was speculated that results seen at 3 months could be enhanced by persistent inflammatory changes, as evidenced by heat shock protein 47 activity, and ongoing collagen remodeling, as demonstrated by certain histologic studies (Hantash BM, Bedi VP, Kapadia B et al. 2007).

Conclusion

Fractionated ablative resurfacing seems to hit sweet spot between the minimal benefits of traditional nonablative laser treatment and the considerable downtime and complications of ablative resurfacing. The ablative fractional CO_2 laser is now replacing other modalities of acne scar management and dominating them. We used to treat acne scars by surgical deep dermabrasion when the patient must take long recovery time and high complication rates including scarring and hypo or hyperpigmentations. Patients now have a choice, with similar results, when treating acne scars: more treatment sessions, less downtime, and less anesthesia with ablative fractional lasers but with minimal complications**.** This study reveals improvement in the scar shape and edge and decrease in its size .The surface area and density decreased at the end of last session of treatment.

References

Adrienne S. Glaich, Zakia Rahman, Leonard H. Goldberg ,and Paul M. Friedman (2007): Fractional Resurfacing for the Treatment of Hypopigmented Scars: A Pilot Study. Dermatologic Surgery. ***33***, Issue 3, pp. 289-294.

Alexiades-Armenakas MR, Dover JS, Arndt KA.(2008): The spectrum of laser skin resurfacing: nonablative, fractional, and ablative laser resurfacing. J Am Acad Dermatol.;***58***:719–737.

Alison M. Layton (2001): Optimal Management of Acne to Prevent Scarring and

Psychological Sequelae, ***2***, Issue 3, pp 135-141.

Anne M. Chapas , Lori Brightman ,Sean Sukal, Elizabeth Hale, David Daniel, Leonard J. Bernstein ,and Roy G. Geronemus.(2008): Successful treatment of acneiform scarring with CO_2 ablative fractional resurfacing Lasers in Surgery and Medicine , ***40***, Issue 6, pp. 381-386.

Balaji Adityan, Rashmi Kumari, Devinder Mohan Thappa alaji Adityan, Rashmi Kumari, Devinder Mohan Thappa (2009): Scoring systems in acne vulgaris . Indian J Dermatol Venereol Leprol. ***75*** . Issue 3. pp : 323-326.

Chapas AM, Brightman L, Sukal S, Hale E, Daniel D, Bernstein LJ, et al.(2008): Successful treatment of acneiform scarring with CO2 ablative fractional resurfacing. Lasers Surg Med.;***40***:381–386.

Goodman GJ, Baron JA(2007).:The management of postacne scarring. Dermatol. Surg. ***33***, 1175–1188.

Guy F Webster (2002): Acne vulgaris.BMJ. Aug 31; ***325***(7362): 475–479.

Hantash BM, Bedi VP, Kapadia B et al. (2007): In vivo histological evaluation of a novel ablative fractional resurfacing device. Lasers Surg. Med. ***39***(2), 96–107.

Hantash BM, Bedi VP, Kapadia B, Rahman Z, Jiang K, Tanner H, et al.(2007): In vivo histological evaluation of a novel ablative fractional resurfacing device. Lasers Surg Med.;***39***:96–107.

Hyoun Seung Lee, Jong Hee Lee, Gun Young Ahn, Dong Hun Lee, Jung Won Shin, Dong Hyun Kim, and Jin Ho Chung (2008):Fractional photothermolysis for the treatment of acne scars: A report of 27 Korean patients. Journal of Dermatological Treatment. ***19***, No. 1 , pp. 45-49.

Kabir Sardana, Vijay K Garg, Pooja Arora, and Nita Khurana (2012): Histological Validity and Clinical Evidence for Use of Fractional Lasers for Acne Scars. J Cutan Aesthet Surg.; ***5***(2): 75–90.

Kee Lee Tan ,Caroline Kurniawati RN, Michael H.(2008): Gold (Low Risk of Postinflammatory Hyperpigmentation in Skin Types 4 and 5 After Treatment With Fractional CO_2 Laser Device. Journal of Drugs in Dermatology August, ***7*** . Issue 8 .

Ortiz AE, Tremaine AM, Zachary CB. (2010): Long-term efficacy of a fractional resurfacing device Lasers Surg. Med. ***42***(2), 168–170.

Susan E. Walgrave, Arisa E. Ortiz, Heather T. MacFalls , Laila Elkeeb, Anne K. Truitt , Joshua A. Tournas , Brian D. Zelickson and Christopher B. Zachary (2009) : Evaluation of a novel fractional resurfacing device for treatment of acne scarring. Lasers in Surgery and Medicine. ***41***, Issue 2, pp. 122–127.

Tahir Jamil Ahmad, Farhana Muzaffar , Haroon Nabi , Sarmad Malik, Ayesha Noreen , Rabiya Hayat (2012): Efficacy and safety of ablative fractional carbon dioxide laser for acne scars. Journal of Pakistan Association of Dermatologists; ***22***:41-44. 41.

Tina S. Alster ,Elizabeth L. Tanzi ,and Melissa lazarus (2007): The Use of Fractional Laser Photothermolysis for the Treatment of Atrophic Scars. Dermatologic Surgery. ***33***, Issue 3, pp. 295–299.

Wichai Hongcharu, Charles R Taylor, Yuchiao Chang, David Aghassi, Kittisak Suthamjariya and R Rox Anderson (2000) . Topical ALA-Photodynamic Therapy for the Treatment of Acne Vulgaris. Journal of Investigative. Dermatology ***115***, 183–192.

Woraphong Manuskiatti, Daranporn Triwongwaranat, Supenya Varothai, Sasima Eimpunth , Rungsima Wanitphakdeedecha (2010): Efficacy and safety of a carbon-dioxide ablative fractional resurfacing device for treatment of atrophic acne scars in Asians. Dermatol Res Pract . ***63***, Issue 2, pp. 274–283.

www.merckmanuals.com/professional/dermatologic-disorders/acne-and related-disorders/acne-vulgaris.

Young Ji Hwang, Yu Na Lee, Yang Won Lee, Yong Beom Choe, and Kyu Joong Ahn. Ann Dermatol (2013):Treatment of Acne Scars and Wrinkles in Asian Patients Using Carbon-Dioxide Fractional Laser Resurfacing: Its Effects on Skin Biophysical Profiles ; ***25***(4): 445–453.

استخدام ليزر ثاني اوكسيد الكاربون لعلاج تندبات حب الشباب

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الخلاصة: تعتبر التندبات الناتجة عن الاصابة بحب الشباب واحدة من اكثر المشاكل التي يعاني منها المصابين بحب الشباب وعلى الرغم من توفر عدد كبير من العلاجات الدوائية والجراحية والليزرية لهذه المشكلة تبقى طبيعة التندب هي التي تحدد النتائج النهائية. يعتبر العلاج بالليزر واحد من اهم الطرق لعلاج هذه المشكلة ومن افضل انواعه الفراكشنال ثاني اوكسيد الكاربون ليزر. الهدف من اجراء هذا البحث هو لتقييم فاعلية الفراكشنال ثاني اوكسيد الكاربون ليزر في علاج تندبات حب الشباب. **طريقة البحث** اجري من كانون الثاني سنة ٢٠١٠ ولغاية تموز ٢٠١٤ باستخدام ليزر الفراكشنال ثاني اوكسيد الكاربون يطول موجي ١٠٦٠٠نانو ميتر تم فحص ومعالجة اربعمائة مريض كلهم يعانون من تندبات حب الشباب ،منهم ١٨٨ رجال و٢١٢ نساء بمعدل اعمار ٣٤ سنة . تم تصنيف المرضى حسب شدة التندبات الى اربعة مجاميع حسب تصنيف كولدمان و براون . تم اجراء ٣-٥ جلسات لكل مريض ،واحدة شهريا،معدل فترة التعرض لليزر كان ١٥ دقيقة،مدة اجراء الجلسة من ساعة الى ساعة ونصف بدون رقود في المستشفى. تم متابعة المرضى لمدة سنة لتقييم نتائج العلاج. **النتائج** تم تقييم النتائج منقبل الطبيب والمريض واعطي التحسن اربعة مستويات وكالتالي: المستوى الاول : بدون تحسن المستوى الثاني التحسن بنسبة ٢٥% المستوى الثالث التحسن بنسبة ٢٥-٥٠% المستوى الرابع التحسن ٧٥% فما فوق اعطى كل من الباحث والمريض نسبة تحسن بحدود ٥٠-٧٥% لكل من عمق التندبات،انسيابية حافات الندب،تقارب الوان الندب مع لون الوجه،شد جلد الوجه والتحسن العام لشكل الوجه. نسب التحسن تتزايد مع زيادة عدد الجلسات وتستمر بالزيادة بمرور شهر الى ثلاثة اشهر بعد انتهاء الجلسات. **الاستنتاجات:** استخدام الفراكشنال ثاني اوكسيد الكاربون ليزر يغطي مساحة عمل تقع فعاليتها في منطقة تتوسط بين الليزر الذي يزيل طبقة كاملة من الوجه وبين الفعالية المحدودة لليزر الواطئ القدرة الذي يحفز نمو الخلايا فقط مع قلة في المضاعفات ومدة الاستطابة.