

## Non Ablative Fractional Photothermolysis for Atrophic Acne Scars

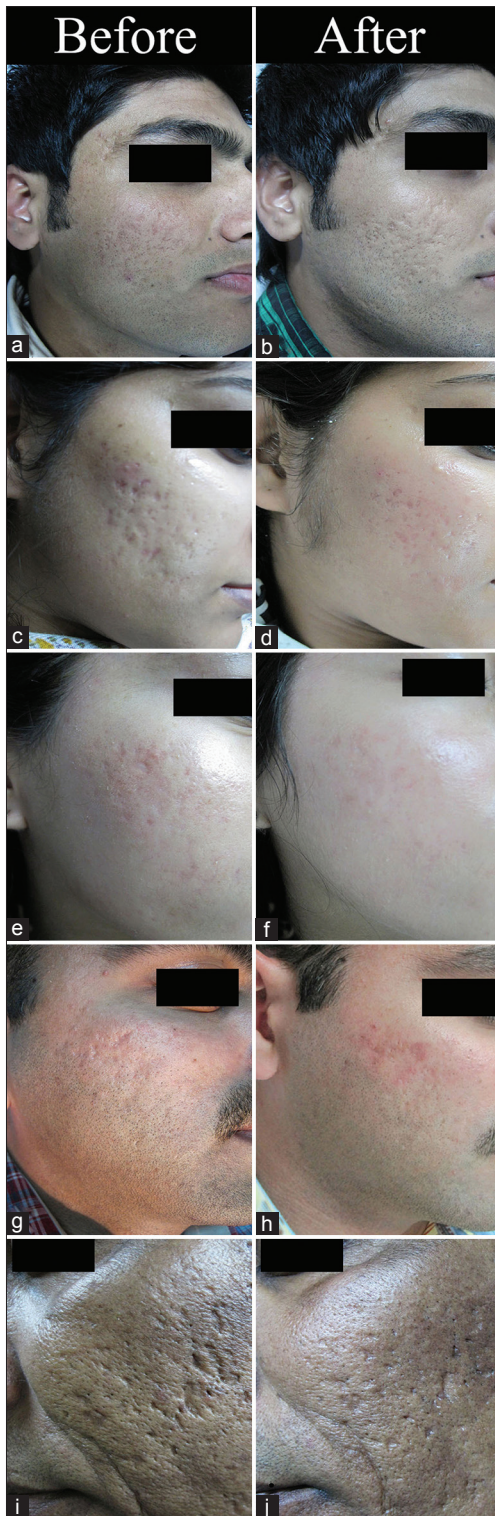
Sir,

Acne scars remain a challenge for clinicians and patients alike. The dermal pathology associated with atrophic acne scars; makes it essential for the clinician to choose a modality that can effectively reach the appropriate depth of both superficial and deep scars.<sup>[1]</sup> Various methods such as chemical peeling, dermabrasion, dermal fillers and surgical correction of the scars have been tried in the past; however, adverse effects such as incomplete improvement of the scars, worsening of scars, and pigmentary changes have limited their use.<sup>[2]</sup> The 1540 nm, non ablative, erbium:glass (Er:Glass) laser is a mid-infrared laser said to be useful in the treatment of atrophic acne scars.<sup>[3-9]</sup> The Er:Glass has the ability to reach a depth exceeding 1000  $\mu\text{m}$  at high pulse energies.<sup>[10]</sup> In a recent analysis carried out by Sardana *et al.* they revealed that even though the mean depth of penetration achieved by the Er: Glass (679  $\mu\text{m}$ ), was less than that of the commonly used fractional ablative lasers (Er:YAG and CO<sub>2</sub>), on facial skin, the difference in the histological depth of the three above mentioned fractional lasers (Er:Glass, Er:YAG and CO<sub>2</sub>) would probably be similar for superficial atrophic acne scars.<sup>[1]</sup> Furthermore, the 1540 nm wavelength is primarily absorbed by water but also targets the sebaceous glands and surrounding dermal matrix and minimal absorption by melanin makes the laser essentially safe for the treatment of dark skinned individuals.<sup>[11]</sup> We report the usage of the Lux 1540 Fraser@ (Palomar Medical Technologies, Burlington, Mass); a 1540-nm, non ablative, fractional device in 25 patients with atrophic acne scars.

The aim of the study was to evaluate the efficacy and safety of the 1540 nm Er: Glass laser in the treatment of facial atrophic acne scars. 15 women, 10 men, ages 24-52 years, mean age 30.08 years, skin phototypes III-V with atrophic acne scars (rolling, boxcar and ice pick scars) were identified and determined eligible for the study. The 10 mm tip (100 microbeams/cm<sup>2</sup>) which helps in deep coagulation was used for the deliverance of light beams, and treatment sessions were carried out every four weeks. The fluence varied from 40-55 mj/mb, depending on the size, shape, depth of the scar and skin thickness. The initial fluence was 40 mj/mb in all cases, and a minimum of 2 passes were given at pulse duration of 15 ms. The passes were delivered with 25-30% overlap. Therapeutic outcomes of the treated areas were conducted by physicians evaluation of comparative photographs using a five point scale,

wherein, 0-no change; 1-slight improvement (0-25%); 2-moderate improvement (26-50%); 3-significant improvement (51-75%); and 4-excellent improvement (>75%). A patient's self-assessment of treatment outcome was also evaluated using the same scale as mentioned above. There was substantial improvement in the appearance of box car and rolling scars, where a decrease in the severity of the scars was noted as a reduction in the depth of the scars, softening of scar contours and a better skin texture [Figures 1a-j]. At 2 months [Figure 2] the physician's evaluation revealed slight improvement (up to 25%) in 10 patients and moderate improvement (26-50%) in 15 patients. The patient self assessment at 2 months showed slight improvement in 14 patients, moderate improvement in 10 patients and significant improvement in one patient. Physician assessment at 4 months [Figure 3] showed a slight improvement in 4 cases, moderate improvement in 14 cases and a significant improvement was noted in 7 cases, whereas the patient assessment revealed a significant improvement in 5 cases.

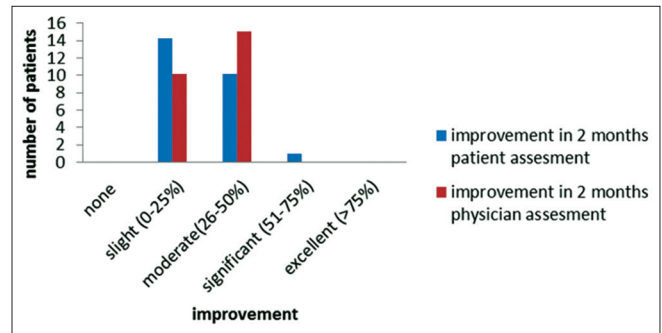
Five of our patients received additional treatments, wherein three of them underwent subcision for selected scars which were non responsiveness to the laser treatment at 2 months, 1 patient underwent chemical peeling (salicylic and mandelic acid formulation) in view of her post inflammatory pigmentation and mild acne associated with the scars and 1 patient underwent TCA cross technique for his ice pick scars, which were non responsive to the laser treatment. The treatment was well tolerated and virtually pain free with only 3 patients complaining of mild pain. This may be due to the contact cooling associated with the Lux 1540 system. Erythema was experienced by 24 patients whereas all cases experienced edema after the treatment sessions. The duration of the erythema ranged from 1-4 days, whereas the edema lasted less than 24 hours in most patients. 2 cases experienced the edema for 2 days. Post inflammatory pigmentation or outbreak of herpes simplex was not seen in any patient. 3 patients in the study group developed post treatment acne, which may be due to disruption of follicular units during treatment and re-epithelialisation as mentioned by Graber *et al.*<sup>[12]</sup> The patients who underwent additional treatments (subcision, TCA cross technique and chemical peels) had a visibly better treatment outcome. We also noticed an improved skin texture and minimal skin



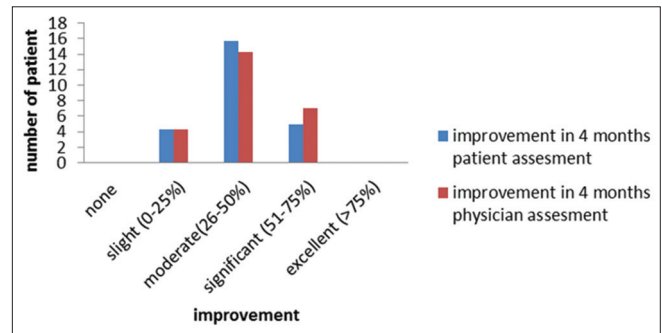
**Figure 1:** (a, c, e, g and i) baseline photographs prior to treatment; (b,d,f, h and i) after 4 treatment sessions; (g, h, i and j) single session of subcision was combined with the treatment; (i) and (j) - note the absence of improvement in the ice pick scars

tightening effect associated with the FP treatment, which has previously been described in the literature.<sup>[13]</sup>

Our study employed a patient and physician dependent



**Figure 2:** Improvement at 2 months follow up



**Figure 3:** Improvement at 4 months follow up

scoring system, which may not be an accurate indicator of treatment outcomes. There is an urgent need for more objective methods of analysis of acne scars and treatment outcomes in studies of this kind. Another lacuna of our study was the lack of histological assessment of the scars, which would have provided us with a more precise measurement of the improvement of the scars. Even though optimal treatment parameters are yet to be determined, the fractional Er:Glass due to its clinical efficacy and low complication profile, appears to a promising treatment modality for atrophic acne scars in individuals of darker skin types (Fitzpatrick skin types III-VI).

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