

# DISCUSSION

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Striae distensae, also known as stretch marks, are a common skin problem. Striae distensae are dermal scars with epidermal atrophy. Histologic findings show thinner thickness and fewer collagen components in the upper dermis. The collagen bundles are thinned and lie parallel to the epidermis, and dermal elastin can be fragmented and markedly decreased. Striae distensae have no medical consequences, but they are frequently distressing to those affected. A variety of treatment modalities have been used for the treatment of striae distensae, but there is no simple and definitive treatment. Topical treatments such as tretinoin cream, combinations of tretinoin and glycolic acid or ascorbic acid and glycolic acid have some effect in the early stages. Recently, several light and laser modalities such as intense pulsed light, pulsed dye laser, copper bromide laser, fractional laser, radiofrequency device, and excimer laser have been demonstrated to achieve some effect in treating striae distensae. <sup>(83-87)</sup>

Needling therapy uses micro-needles that penetrate to a depth of 2.5 mm, and it causes virtually no bruising and minimal swelling. It produces hundreds of tiny dermal injuries that produce dermal collagen and elastin. A needle therapy system has been introduced to treat wrinkles and depressed scars. When a needle penetrates the skin, the injury causes localized damage and minor bleeding by rupturing fine blood vessels. A day after needling therapy, keratinocytes begin to proliferate and release growth factors to promote collagen deposition by the fibroblasts. Needling therapy modulates the expression of several genes in the skin (vascular endothelial growth factor, fibroblast growth factor, epidermal growth factor, collagen type I and III) that promote extracellular matrix remodeling. Needling therapy can be safely performed on all skin colors and types without the risk of dyspigmentation, which is the major safety feature distinguishing it from other invasive procedures used to treat wrinkles and depressed scars, such as laser resurfacing, deep chemical peels, and dermabrasion. <sup>(88-90)</sup>

The wound healing properties of Platelet-rich plasma (PRP) has also been applied in treating striae distensae. Platelet-rich plasma (PRP) represents a new bio technology that is part of the growing interest in tissue engineering and cellular therapy today. By definition, PRP is an autologous preparation of platelets in concentrated plasma. Although the optimal PRP platelet concentration is unclear, the current method by which PRP is prepared is reported to involve 300-700% enrichment, with high platelet concentrations. Owing to these high concentrations of growth factors, PRP has been used successfully in periodontal therapy, maxillofacial surgery, orthopedics, and sports medicine and recently, PRP has attracted attention in the field of dermatology. <sup>(91,92)</sup>

This is a study to compare between the effect of micro-needling alone and combined with PRP on striae distensae (alba and rubra) performed on twenty female patients. Patients' right sides were subjected to treatment with micro-needling alone, while their left sides were subjected to micro-needling with autologous platelet rich plasma preparations. Each patient was subjected to 4 treatment sessions, with 2 weeks in between.

The age of patients ranged from 15-30 years with a mean age of 23.6 years  $\pm$ 4.5, of Fitzpatrick skin types II, III, IV and V (three patients of type II, two patients of type III, eleven patients of type IV and 4 patients of type V).

The duration of striae varies in the present study : 4patients (20 %) have less than 1 year duration of the striae, 11 have duration 1-1.5 years (55%) and more than 1.5 years in 5 patients (25%) were included in this study

The clinical assessment was objectively based on clinical photography before and three months after the last treatment session by means of quartile grading system, patient satisfaction and stretch mark scores.

According to Quartile grading system; the degree of improvement is classified into mild (0-24%), moderate (25-49%), marked (50-74%) and excellent (75-100%). On the right side, 8 patients showed minimal improvement (40%), and the same number showed moderate improvement, while marked improvement appeared in 4 patients (20%). On the left side, minimal improvement appeared in 3 patients (15%), moderate in 7 ones (35%), and marked in 10 patients (50%). None of the patients included in the study showed excellent improvement.

Kui Young Park et al had conducted a pilot study, to assess the treatment of striae distensae using needling therapy, 16 patients completed the study and 87.5% of them were females of Fitz Patrick skin types III and IV, with a mean age of 31.7 years. Striae distribution was in abdomens, buttocks and thighs. Three months after the last treatment, marked to excellent improvement was noted in seven (43.8%) patients and minimal to moderate improvement in the remaining nine (56.2%). None of the patients reported a lack of change in or worsening of their striae distensae. The mean improvement score was 2.4.<sup>(93)</sup>

This was in agreement with the current study as there is no worsening of the striae in both studies, and about 40% to 50% showed marked improvement according to quartile grading system.

Another study had been performed in Korea by Dong-Hye Suh et al for the treatment of striae distensae using combined enhanced penetration platelet-rich plasma and ultrasound after plasma fractional radiofrequency. The study was conducted on 18 female patients with a mean age of 34.11 years and Fitz Patrick skin types III, IV and V. Again, striae distribution was in abdomens, buttocks and legs. At two months after the last treatment, the average width of the widest striae decreased from 0.75 to 0.27 mm. In the objective assessment, two blinded reviewers rated 'excellent' results in six of 18 (33.0%) participants, 'very good' in seven (38.9%), 'good' in four (22.4%), and 'mild' in one (5.6%).<sup>(94)</sup>

A third Korean pilot study evaluating the efficacy of intradermal radiofrequency combined with autologous platelet-rich plasma in striae distensae treatment. The study was performed on 19 patients; all of them were females with Fitz Patrick skin type IV, and a mean age of 29.9 years, with striae distribution on abdomens, thighs and axillae. Evaluation of clinical results at four weeks after treatment showed that only one (5.3%) of the 19 patients achieved excellent improvement, whereas seven (36.8%) demonstrated marked improvement, six (31.6%) showed moderate improvement, and five (26.3%) showed mild improvement. None of the patients showed worsening of striae distensae .<sup>(95)</sup>

The last two listed studies showed that there is an obvious role of PRP in striae distensea treatment which was brilliantly obvious in the present study.

Concerning stretch marks clinical scoring, score 0: no stretch marks, score 1: presence of stretch marks of slight importance; with few stretch marks and / or thin ( $\leq 1$  mm), very pale pink. Score 2: presence of stretch marks of moderate importance; numerous stretch marks and / or moderate wideness ( $>1$  mm and  $\leq 2$  mm), frank pink. Score 3: presence of stretch marks of severe importance; very numerous stretch marks and / or important wideness ( $>2$  mm), red / purple / lilac in color.<sup>(80)</sup>

After 3 months of follow up of treatment with micro-needling alone on the right side and PRP on the left side, score 1 was achieved by 8 patients for the right side (40%), and 14 patients for the left side (70%), score 2 was gained by 8 patients for the right side (40%), and 5 for the left one (25%), and finally score 3 by 4 patients for the right side (20%), and a single one for the left side (5%).

Dong-Hye Suh et al found that at two months after the last treatment, the average width of the widest striae decreased from 0.75 to 0.27 mm.<sup>(94)</sup>

This was in agreement with the current study as there was a decrease in striae width after using PRP more than the decrease achieved with rolling alone.

Regarding patient satisfaction score; where patients will be classified according to the degree of satisfaction into 3 grades; (A) = unsatisfied, (B) = somewhat satisfied and (C) = highly satisfied. On the right side, 4 patients were unsatisfied (20%), 6 patients were somewhat satisfied (30%), while 10 patients were highly satisfied (50%). On the left side, 2 patients were unsatisfied (10%), 4 patients were somewhat satisfied (20%), and 14 patients were highly satisfied (70%).

Needling therapy, which was conducted by Kui Young Park; lead to variation in patient satisfaction degrees; as 12.5% of patients were unsatisfied, 50% were somewhat satisfied and 37.5% of them were highly satisfied. While, combined enhanced penetration PRP with ultrasound after plasma fractional radiofrequency conducted by Dong-Hye Suh et al, lead to a more patient satisfaction; where 72.2% of patients were highly satisfied.<sup>(94)</sup> Moreover, a nearly similar result was found with treatment of striae distensae with autologous PRP and intradermal radiofrequency, conducted by Kim IS et al; as 63.2% of patients were satisfied or very satisfied, although both researchers used different combined treatment with needling therapy, which differs from the current study.<sup>(95)</sup>

Regarding the complications, in this study, Pain occurred in all patients with different degrees, despite the use of local anesthetic cream under occlusion; 9 patients (45%) complained of mild pain, 10 patients (50%) of moderate degree and the remaining one patient (5%) suffered from severe pain. All patients suffered from bleeding during the session and erythema 1-2 days after. 11 patients (55%) showed a single day erythema, and 9 patients (45%) continued for 2 days. 30 % noticed post rolling crusting.

The pilot study that performed by Kui Young Park et al, and included needling as a treatment modality; treatment was well tolerated, with only minor side effects during and after the treatments, including pain, erythema, spotty bleeding, and pruritus. These resolved within several days without any treatment (93). While the only reported side effect by Dong-Hye Suh et al was post inflammatory hyperpigmentation, which improved in four weeks, in two individuals (11.1%).<sup>(94)</sup>

In both studies; the current and the Kui Young Park et al's ones: pain, erythema and spotty bleeding were common side effects. Although there were 2 patients showed post inflammatory hyperpigmentation in Kui Young Park et al's study.

In a study conducted in the University of Banha, to compare the effects of dermaroller 2mm alone and dermroller combined with chemical peeling by TCA 15-30% in the management of abdominal striae distensae, in 30 female patients with different degrees (alba and rubra). All patients received dermaroller 2mm treatment on both sides of the abdomen, 4-6 sessions with 3 weeks interval. Chemical peeling was done immediately after dermaroller on the right side only of the abdomen. Although all patients of the both groups received topical anesthesia in the form of ultracain cream under occlusion for 30-45 minutes before the session, all patients (100%) complained of variable degrees of pain during the use of dermaroller that was generally tolerable and resolved by the end of the session. Transient erythema and edema occurred immediately during the procedure and lasts for one day for the first group who had undergone micro-needling alone, and for 3 days for the other one who had undergone chemical peeling after micro-needling. All patients of the chemical peeling associated group complained of additional side effects in the form of burning sensation, cosmetic discomfort which was noticed in all patients due to the presence of brownish crusts within 2 days that lasted for 7-10 days. Post crust erythema and transient post inflammatory hyperpigmentation occurred especially after application of higher concentration of TCA (30%) and faded within 2-4 months according to degree of severity.<sup>(96)</sup>

By checking the study conducted in the University of Banha; pain, erythema and spotty bleeding were proved to be the commonest side effects of micro-needling and that hyperpigmentation is an accidental Side effect as it happened in two patients in the Kui Young Park et al's study and happened after chemical peeling in the study conducted in the University of Banha.

Better skin texture, tightness, and color were noticed in results of micro-needling in all studies that have used micro-needling technique on striae distensea.

# SUMMARY

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Stretch marks (also known as striae distensae) are a common skin condition that appear initially as red (stria rubra), and later on as white (stria alba) lines on the skin. These lines represent scars of the dermis, they are linear atrophic depressions of the skin that form in areas of dermal damage produced by stretching of the skin, and are characterized by linear bundles of collagen lying parallel to the surface of the skin, as well as eventual loss of collagen and elastin accompanied by epidermal atrophy. Though, striae do not cause any significant medical problem, they can be of significant disfigurement to those affected.

They are associated with various physiologic states, including puberty, pregnancy, growth spurts, rapid weight gain or loss, obesity, and states that induce high steroid hormone levels.

Various treatments are available for the purpose of improving the appearance of existing stretch marks, including topical preparations such as tretinoin, glycolic acid and trichloroacetic acid peels, laser treatments, microdermabrasion, radiofrequency devices and micro-needling therapy alone or combined with platelet rich plasma.

This comparative study was performed on twenty female patients; with striae distensae (alba and rubra). The patients were exposed to 4 sessions of micro-needling alone on the right side and micro-needling with platelet rich plasma on the left side.

Assessment was objectively based on clinical photography before and three months after laser treatment by means of Quartile grading system, patient satisfaction score and stretch mark scoring system.

According to Quartile grading system; on the right side, 8 patients showed minimal improvement (40%), and the same number showed moderate improvement, while marked improvement appeared in 4 patients (20%). On the left side, minimal improvement appeared in 3 patients (15%), moderate in 7 ones (35%), and marked in 10 patients (50%). None of the patients included in the study showed worsening of their striae.

Concerning stretch marks clinical scoring, score 1 was achieved by 8 patients for the right side (40%), and 14 patients for the left side (70%). According to patient satisfaction score; on the right side, 4 patients were unsatisfied (20%), 6 patients were somewhat satisfied (30%), while 10 patients were highly satisfied (50%). On the left side, 2 patients were unsatisfied (10%), 4 patients were somewhat satisfied (20%), and 14 patients were highly satisfied (70%).

Regarding the complications; pain, spotty bleeding and erythema considered a normal un avoidable complications of micro-needling.

Finally, micro-needling with PRP could be considered as a promising option in the treatment of striae distensae with reduced risk.