

## **Striae cutis distansae and the possibilities of influencing them therapeutically**

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Striae cutis distansae, also referred to as atrophica lineares, atrophica striata, atrophoderma striatum, striae adolescentium, striae albae, striae atrophicae, striae lividae, vergetures lineaires, or pregnancy marks, etc. (3, 4, 5) were first described by Roeder in 1773 (6) as relatively frequent and not very unusual changes of the skin. At the beginning of the twentieth century they were usually described as mechanically caused subepidermoid clefts, a result of pressure and torn elastic fibres (5, 7, 8). Today, some modern dermatological publications no longer include striae as a separate nosological unit, but rather as a symptom accompanying some endocrine diseases, or as an adverse effect of corticoid therapy.

Striae undoubtedly represent a serious aesthetic and mental issue for the majority of the affected population. Although they do not bring about a serious functional limitation, in some professions (models, actresses) they limit work or social life. Due to the same reasons they are a handicap to top sportsmen (bodybuilders).

**Clinical pattern:** striae cutis distansae are characterised by atrophic linear skin lesions, in some cases bended or waved, varying in length from millimetres to for example 38 centimetres. Also their width may vary from 1 mm to extremely wide formations of more than 1-6 centimetres (9) – Picture 1. They are delineated with pink, bluish red, livid, later pearl blue colour, or appear colourless, as is the case in scars. Stretch marks are always soft. They are usually multiple, running along Langer's lines (3, 4, 8) in parallels (in some cases also running across them, when they affect knees, or the back). They appear symmetrically in areas with skin tension, on the hips, abdomen, buttocks, thighs, breasts, knees, and back (3, 4, 5, 6, 7, 9, 10, 11, 12, 13). A special rare form is represented by striae migrans (Shelley and Cohen, 1964) which grow in length, occurring in youth on the inner thighs. The same changes may be observed in this area following local therapy with corticoids (3, 4). Subjective symptoms are not reported; rarely some patients claim to have burning or prickling sensation at the initial stage of stretch mark formation. The clinical forms include also hypertrophic striae cutis distansae, which later change into the typical atrophic form (14), and the following rare manifestations: keloid configurations, spontaneous pigmentations, ulcerations, or spontaneous ruptures (9, 15, 16).

Occurrence in age groups: striae cutis distensae may develop in children (with genetic predispositions or in the course of therapy of serious health conditions), in both sexes they very often occur in puberty, and in pregnancy in women. Regardless of age or sex they accompany dramatic weight changes, also those caused by drugs, whereby a role is played by the physical activities in which individuals engage. The data on biotypes and races in connection with the formation of stretch marks suggest more frequent occurrence in Caucasians and Negroes (3). Striae are more common in women (3, 4, 11, 13, 17), with the exception of dorso-lumbar striae more common in teenage boys developing due to accelerated growth (18,19).

Aetiopathogenetic causes may be divided into the following main groups:

- Mechanic - distensions, traumas (some authors do not acknowledge mechanic factors as possible causes, only as an accompanying moment (10, 11)
- Biochemical (hormones, metabolic disorders, toxic substances)
- Genetic predispositions
- Pregnancy (often present in localities marked by specific dermatoses in pregnant women – toxemic rash, prurigo, urticarial vasculitis, etc.)

There is a special group of clinic correlations with serious health conditions (3, 4)

- Infections and consumptive diseases (such as TBC pulmonum, pneumonia, feverish conditions, Hodgkin's disease, nephritis, etc.)
- Metabolic and endocrine disorders (Cushing's syndrome, obesity, diabetes mellitus type I, etc.)
- Anetoderma
- Marfan syndrome, Buschke-Ollendorf syndrome, pseudoxanthoma elasticum, calcinosis cutis
- Dystrophic skin changes (senile elastosis, actinic elastosis)
- Localised skin tension (oedema, tumours)
- Other

Corticoid therapy of serious diseases (especially long-term) as well as the abuse of anabolic drugs have been known and observed as causative factors of striae for a very long time (3, 4, 9, 11, 12, 16, 20)

Histology: changes in elastic fibres, which become ropy, ruptures, fragmentation, and complete absence thereof. On the borders there are defects of elastic fibres present in clusters and deteriorated, homogenised collagen (3, 4, 11, 13). The first histological description in history was elaborated in 1889 by Troisier and Ménetier (21) and in 1894 by Unna (22). At

present we have a number of expert papers aimed at single structures: elastic and collagen fibres, fibroblasts, and adnexa of the skin.

Differential diagnostics of striae cause causes no problems, but in 1989 Burket et al (23) described a new clinical unit called linear focal elastosis or elastosis striae and this diagnosis must be distinguished from striae atrophicae. This issue was again discussed in the work of White from 1992 (24). When localised on the lower lip, the condition must be distinguished from the microform cleft lip (25).

Most authors are sceptical as regards the therapy of striae (4, 6, 7, 9, 10, 11, 15, 26). In history we find the opinion of a Czech professor Šamberger from 1925 (7): „Striae – there is no cure for them. We can only prevent them from developing by adopting a healthy lifestyle, appropriate muscle activity at work, sport and during pregnancy. Remember: The main cause of striae is idleness!!!“.

Also today the possibilities of influencing striae therapeutically are insignificant and produce minimum effects. What seems quite elegant and promising is the TRILIX method developed by Italian experts, and there are some attempts to employ laser therapy (fraction CO<sub>2</sub>), surgical remodelling, combined methods, various types of peels combined with occlusion, carboxytherapy, dermarollers, microdermabrasion, conservative therapy (1, 2, 3, 27, 28, 29, 30, 31, 32, 33, 34) . The said therapeutic approaches rarely bring satisfying aesthetic effects, moreover, they are not always applicable and their effects in general are disputable. Affected patients end up using camouflage techniques.

In our clinic, we have been using conservative methods to treat hypertrophic scars and keloids (27, 28, 29, 30, 31, 34) as well as atrophic scars and striae for many years. In connection with this condition we started working with various topically applied agents containing cepae extract, heparin and allantoin a gel vehicle in 1996. The indication range of the used topical preparations is very broad, including hypertrophic, keloid, movement limiting and cosmetically disturbing scars after operations, amputations, burns and injuries. The agents are successful in treatment of Duputryens contractures, traumatic contractures of the tendons, deforming scars, atrophic scars as well as striae. The first aesthetically promising results of striae therapy were presented in 1999 and 2000 (29, 30). Since 2004 we have been treating striae with TCA peel and occlusion with clinically and aesthetically satisfying results. In 2006 and 2008 we were influencing striae therapeutically, using a product containing *Centella asiatica* and *Pinus sylvestris* (31, 34).

In 2005 – 2009 we compared the therapeutic effects of carboxytherapy, TCA peel and occlusion, and conservative therapy with topical products containing cepae extract, heparin

and allantoin a gel vehicle or products with *Centella asiatica* and *Pinus sylvestris* on *striaeae cutis distensae*. The groups of 140 in total patients were comparable (in every group there were 35 patients of comparable sex, age, causative factors, locality and duration of striae).

Carboxytherapy was applied 10 times, once a week, TCA peel and occlusion were applied 3 to 5 times at a 10 to 14 day interval, topical preparations were applied 2 times a day using specialised massage movements for at least 3 months. Our staff instructed all patients in the massage technique. Massage moves were performed using two fingers. 10 massage moves are performed and repeated 10 times each, 2 times a day.

## Results

The tolerability of all said methods (carboxytherapy, TCA peel with occlusion) as well as conservative therapy with topical preparations containing cepae extract, heparin and allantoin a gel vehicle or products containing *Centella asiatica* and *Pinus sylvestris* was excellent in all observed patients, none of the patients discontinued therapy or developed undesired effects.

Both the patients and the therapists assessed the therapy with all mentioned methods and techniques in the same way – they all achieved only **partial** cosmetic and aesthetic effect. In most patients there was reduction in the appearance of striae by approximately one third, and an evident improvement of their colour and the quality of the surrounding skin. In patients who started to treat their stretch marks immediately after noticing first symptoms it was possible to stop further progression, and in three cases with mild striae it was possible to achieve complete clearance of skin changes (using peels) – Picture 2, 3.

The results of topical therapy influencing *striae cutis distensae* by various therapeutic modalities were assessed as follows:

- Best effects were observed with TCA peel with occlusion (this technique requires erudition and experience on the side of the therapist)
- Quite good effects were obtained with carboxytherapy, and some patients require to be treated with this method.
- Topical preparation containing *Centella asiatica* and *Pinus sylvestris* produced a change in skin parameters (positive change in colour and improved quality of the skin), but we observed no significant effect on striae – pictures 4 and 5.

- Least positive effects were observed after the application of a product containing cepae extract, heparin and allantoin in a gel vehicle.

We should mention that some patients continued applying topical preparations also after the trial and after 6 months, and they reported subjectively satisfying results (especially the products with *Centella asiatica* and *Pinus sylvestris*). Compared to other known and used methods the application of external preparations is painless, simple, and affordable for the patient.

Eighty patients have been followed for two years now after therapy termination and on the originally treated localities the final effects remained unchanged. In case new manifestations occur, the patients spontaneously start to treat those by applying topical preparations containing *Centella asiatica* and *Pinus sylvestris*. Most effective results were obtained in a 23-year old female with extensive if not generalised striae manifestations (affecting arms, abdomen, hips, thighs, and buttocks) which developed two weeks post partum and progressed significantly in the following two months. The striae were up to 1 cm wide, deep violet, and the patient reported burning sensation. When she stopped breastfeeding, she underwent unsuccessful laser therapy. She was quite sceptical when we started with the application of TCA peel with occlusion. The final effect was observed the third treatment session, later she required to be treated with a conservative method due to lack of time, and started applying a cream containing *Centella asiatica* and *Pinus sylvestris*. Six months later she was treated with combined techniques (TCA peel with occlusion, massage with a cream containing *Centella asiatica* and *Pinus sylvestris*) with positive aesthetic results. The patient continues applying the cream using the recommended massage moves.

### **Discussion**

We assume that the elaborated massage system and the application of creams containing active agents are very useful. Fine targeted massage of the locality improves blood circulation and fosters the repair and new formation of elastic fibres and deterioration of homogenised collagen. Histological examination of the repaired skin was not possible, since our patients refused samples be taken.

The stated treatment techniques including carboxytherapy, peels, and the application of creams by massage have no contraindications (except for persons allergic to product

ingredients or parabens ) and maybe used in any age group. The application technique is very simple.

It is very important to inform patients that during therapy it is inevitable to avoid irritations and protect the treated localities from extreme cold and UV rays. Massages must be soft, without unnecessary pressure applied to avoid micro-traumas.

### **Conclusion**

It is not possible to therapeutically influence and completely repair fully developed striae. The presented therapeutic approaches only obtain partial results, which are, however, aesthetically satisfying for the patients and have great impact on their mental comfort. In the end, however, many patients decide to use camouflage techniques.

### Summary

#### **Striae cutis distansae and the possibilities of influencing them therapeutically**

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Striae cutis distansae are an important aesthetic as well as psychological problem for a large part of population. Although they do not cause significant functional impairment, in certain patients (models, actors) however they limit their professional and social realization. Therapeutic options have been relatively uncertain, seldom esthetical satisfying, not always applicable and the effect was disputable (TRILIX, laser therapy, surgical remodelling, combined methods, peelings, carboxytherapy, dermarollers, and conservative therapy). The work compares four therapeutic approaches – TCA peel with occlusion, carboxytherapy, the application of creams containing cepae extract, heparin and allantoin and the application of creams containing Centella asiatica and Pinus sylvestris applied using an elaborate system of massage movements. Best effects were observed in the application of TCA peel with occlusion. When the localities are treated using the massage moves applying a cream containing Centella asiatica and Pinus sylvestris, the aesthetic effect is potentiated.

**Key words:** striae cutis distensae, therapy

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Picture description:

Picture 1 – Striae in a 17-year old female

Picture 2 – Striae glutealis before the application of TCA peel with occlusion

Picture 3 – Striae gluetalis in the same female patient after TCA peel with occlusion (3 sessions)

Picture 4 – Striae in a 21 year old male

Picture 5 – Striae in the same male patient after two months of therapy with a product containing Centella asiatica and Pinus sylvestris applied by special massage

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