**Striae Distensae**

**Background:** Striae distensae, a common skin dermatosis, do not cause any significant medical problem; however, striae can be of significant distress to those affected. They represent linear dermal scars accompanied by epidermal atrophy.

**Pathophysiology:** Striae distensae affect skin that is subjected to continuous and progressive stretching; increased stress is placed on the connective tissue due to increased size of the various parts of the body. It occurs on the abdomen and the breasts of pregnant women, on the shoulders of body builders, in adolescents undergoing their growth spurt, and in individuals who are overweight.

Skin distension apparently leads to excessive mast cell degranulation with subsequent damage of collagen and elastin. Prolonged use of oral or topical corticosteroids or Cushing syndrome (increased adrenal cortical activity) leads to the development of striae. Genetic factors could certainly play a role, although this is not fully understood.

**Frequency:**

- **In the US:** Approximately 90% of pregnant women, 70% of adolescent females, and 40% of adolescent males (many of whom participate in sports) have stretch marks.

- **Internationally:** International figures may reasonably mirror the numbers in the United States.

**Mortality/Morbidity:** Striae distensae are usually a cosmetic problem; however, if extensive, they may tear and ulcerate when an accident or excessive stretching occurs.

**Race:** Stretch marks affect all races.

**Sex:** Striae affect women more commonly than men.

**Age:** Stretch marks affect adolescents, pregnant women, and patients with excessive adrenal cortical activity.

**Physical:** Early striae present as flattened, thinned skin with a pink hue that may occasionally be pruritic (itchy). Gradually, they enlarge in length and width and become reddish purple in appearance (striae rubra). The surface of striae may be finely wrinkled. Mature striae are white, depressed, irregularly shaped bands, with their long axis parallel to the lines of skin tension. They are generally several centimeters long and 1-10 mm wide. Gradually, some striae may fade and become inconspicuous. The natural evolution of stretch marks is similar to that of scar formation or a healing wound.
In pregnancy, striae usually affect the abdomen and the breasts.

The most common sites for striae on adolescents are the outer aspects of the thighs and the lumbosacral region in boys and the thighs, the buttocks, and the breasts in girls. Considerable variation occurs, and other sites, including the outer aspects of the upper arms, are occasionally affected.

Striae induced by prolonged systemic steroid use are usually larger and wider than other phenotypes of striae, and they involve widespread areas, occasionally including the face.

Striae secondary to topical steroid use are usually related to enhanced potency of the steroids when using occlusive plastic wraps. They usually affect the flexures and may become less visible if the offending treatment is withheld early enough.

**Causes:**

The factors that lead to the development of striae are poorly understood. No general consensus exists as to what causes striae. One suggestion is that they develop as a result of stress rupture of the connective tissue framework. It has also been suggested that they develop more easily in skin that has a high proportion of rigid cross-linked collagen, as occurs in early adult life. This is evident in striae due to pregnancy, lactation, weight lifting, and other stressful activities. Increased adrenal cortical activity has been implicated in the formation of striae, as in the case of Cushing syndrome. Additionally, the cellular and extracellular matrix alterations that mediate the clinical phenotype of stretch marks remain poorly understood.

**Other Problems to be Considered:**

Although the diagnosis of striae is usually straightforward, the rare possibility of Cushing syndrome must be entertained. In the latter, striae are characterized by their inordinate breadth, depth, and intense color.

In linear focal elastosis (elastotic striae), asymptomatic, yellow linear bands arrange themselves horizontally over the lower back. These lesions may resemble striae distensae, but they are palpable rather than depressed and yellow rather than purplish or white.

**Histologic Findings:** In the early stages, inflammatory changes may predominate; edema is present in the dermis along with perivascular lymphocyte cuffing.

In the later stages, the epidermis becomes thin and flattened with loss of the rete ridges. The dermis has thin, densely packed collagen bundles arranged in a parallel array horizontal to the epidermis at the level of the papillary dermis. Elastic stains show breakage and retraction of the elastic fibers in the reticular
dermis. The broken elastic fibers curl at the sides of the striae to form a distinctive pattern.

Scanning electron microscopy shows extensive tangles of fine, curled elastic fibers with a random arrangement. This arrangement is in contrast to normal skin, which has thick, elastic fibers with a regular distribution. When viewed by transmission electron microscopy, the ultrastructure of elastic and collagen fibers in striae is similar to that of healthy skin.

**Medical Care:** Adolescents with striae can expect some improvement in their striae with time.

**Surgical Care:** The authors have had good success using low concentrations (15-20%) of trichloroacetic acid (TCA) and performing repetitive papillary dermis-level chemexfoliation. The peels can be repeated at monthly intervals. Significant improvement in regard to skin texture, firmness, and color can be achieved. *(I do not think this the best, needling is much better in concept and in practice- EE)*

Treatment with the 585-nm flashlamp pulsed dye laser at low energy densities was shown to improve the appearance of striae. Multiple treatments at 4- to 6-week intervals are usually required.

Certainly, both modalities (pulsed dye laser and TCA peels) can be sequentially performed for optimal results.

Drugs of choice should have the ability to improve the skin texture and color, to remodel the collagen in the dermis, and to promote elastin synthesis.

**Drug Category:** *Retinoids* -- Topical retinoids have been shown to be beneficial in remodeling hypertrophic scars and in improving the clinical appearance, including improvement of the surface texture, fine and coarse wrinkling, skin color, and laxity, of photoaged skin after 3-6 months of therapy.

*(Naturally I would recommend the balance formulation of Environ in stead of the treatments below- EE)*

| Drug Name       | Tretinoin (Avita, Retin-A) -- *Trans*-retinoic acid is a derivative of vitamin A (retinol), effectively used to treat acne vulgaris and other disorders of keratinization for the past 3 decades. Exhibits a certain degree of vitamin A growth-promoting activity; however, it is not stored in the body as retinol and its esters. Rather, it is metabolized rapidly and mostly excreted in bile. When administered topically, a minute amount passes through dermis but has not been detected systemically. In epithelial cells, affects differentiation, |
neoplastic transformation, tumor promotion, collagen synthesis, wound healing, stimulation and modulation of immune response, inflammation, cell membranes, and many other processes. 0.05% strength has been shown to improve hypertrophic scars. Postulated that this is due to effect on fibroblasts (ie, decreased fibroblast proliferation and decreased fibroblast collagen synthesis). Effect on fibroblasts is mediated through specific binding receptor proteins. Topical application significantly improves clinical appearance of early, active stretch marks. Processes responsible for clinical improvement remain unknown.

Patients are instructed to gradually increase amount of tretinoin until mild erythema and exfoliation develops; may also apply a bland emollient if excessive irritation develops.

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<thead>
<tr>
<th>Adult Dose</th>
<th>Apply 0.05% or 0.1% cream on affected areas qd/bid</th>
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<tbody>
<tr>
<td>Pediatric Dose</td>
<td>Apply as in adults</td>
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<tr>
<td>Contraindications</td>
<td>Documented hypersensitivity</td>
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<tr>
<td>Interactions</td>
<td>Concomitant topical medication, medicated or abrasive soaps, and cleansers, soaps, and cosmetics have strong drying effects; caution with products high in alcohol, astringents, spices or lime, and preparations containing sulfur, resorcinol, or salicylic acid because tretinoin toxicity may increase</td>
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<tr>
<td>Pregnancy</td>
<td>C - Safety for use during pregnancy has not been established.</td>
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<td>Precautions</td>
<td>Discontinue if reaction suggesting sensitivity or chemical irritation occurs; minimize exposure to sunlight, including sunlamps, during use, and advise patients with sunburn not to use product until fully recovered because of heightened susceptibility to sunlight; wearing protective clothing and applying sunscreen products over treated areas is recommended; weather extremes (eg, wind, cold) may irritate patients; degree of local irritation</td>
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warrants either less frequent applications or treatment to be discontinued (temporarily or altogether)

Complications:

- Striae are usually of a cosmetic concern; however, if extensive, they may rupture in an accident.

Prognosis:

- Adolescents with striae can expect their striae to be less visible with time.

References

- Treatment with tretinoin, flashlamp pulsed dye laser, and chemical peels significantly improves the clinical appearance of early, active stretch marks.


