

Natural Herbs: An Approach to Cellulite Treatment

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Abstract: Cellulite is a skin condition that causes dimpled or orange peel appearance on the skin surface. It is also called as Gynoid Lipodystrophy. It mainly affects women. There are various proposed treatments for cellulite amongst which topical treatment are most commonly used today. These products become more effective with the addition of natural herbs. This review article presents the effectiveness of various herbs which help to reduce the formation of cellulite.

Index Terms – Cellulite, Gynoid Lipodystrophy, topical treatment, herbs for cellulite.

INTRODUCTION

Cellulite is a cosmetic, localized skin condition that causes a dimpled appearance on the surface of the skin. Cellulite is not a disease but rather a cosmetic skin condition that is very common, especially among women.¹ Cellulite is a multifactorial condition that is present in 80-90% of the post-pubertal women². Cellulite, also known as gynoid lipodystrophy and edematous fibrosclerotic panniculopathy, is an alteration in the surface contour of the skin in which areas of lumpy bumpiness seem to alternate with areas of skin dimpling. This uneven skin texture is most prevalent in the abdomen, hips, thighs and buttocks. It is estimated that 85% of post pubertal women have some degree of cellulite³.

Cellulite is caused by a build-up of fat underneath the skin⁴. The main cause of cellulite is to be found in the structure and condition of the connective tissue. In the female thigh, arched and almost perpendicular collagen fibre bundle run through the subcutis. These structures determine the skin texture at the interface between corium and subcutis⁵.

It is rarely seen in males and almost ubiquitous in post-pubertal females. It is seen more commonly in males with androgen-deficient states such as Klinefelter's syndrome, hypogonadism, post-castration states and in those patients receiving estrogen therapy for prostate cancer. The cellulite become more severe as the androgen deficiency worsens in these males⁶.



Fig. 1 – photographic representation of skin with cellulite and skin without cellulite⁷

CLASSIFICATION

A number of different classification systems have been used to categorise cellulite according to its clinical and histopathologic changes. The one described by Curri in 1991 grades the change on scale of 1-4³.

Grade 1	Patient asymptomatic; no clinical alterations; histopathologic alteration only.
Grade 2	Grade 1+ skin pallor; decreased elasticity after skin compression/muscular contraction.
Grade 3	Grade 2+ visible orange peel appearance at rest; decreases elasticity.
Grade 4	Grade 3+ more palpable visible and painful nodules; dimpled, wavy appearance of the skin surface at rest.

CLINICAL CHANGES⁸

Gynoid lipodystrophy (GLD) may also be classified by skin consistency: hard, flaccid, oedematous or mixed.

HARD

Hard GLD is observed in young women who perform regular physical activity. The appearance is compact and firm. On pinching, the peel orange aspect is evident. This pattern is frequently associated with stretch marks and it is the most common pattern found among teenagers.

FLACCID

Flaccid GLD is found in inactive women. It is associated with muscular hypotonia and flaccidity. It also occurs in women who have lost weight suddenly. Occasionally, the flaccid form of GLD, occurs if the hard form of GLD is not treated appropriately.

OEDEMATOUS

Oedematous GLD manifests as increased volume of the entire lower limbs and a positive Godet sign (depression of the tissue to fingertip palpation, which persist when the finger is removed). The skin is bright and thin. A sense of heaviness and sore legs are common complaints. It is the most severe and fortunately, the least frequent of the GLD patterns.

MIXED

Mixed GLD occurs most often. Here, more than one kind of GLD can be observed on different sites in the same patient.

CAUSES OF CELLULITE⁹

- Excessive intake of food products rich in fats, with high salt and preservative contents has been associated with the development of various metabolic disorders including cellulite.
- Lack of physical activity increases the severity of cellulite.
- Alcohol consumption stimulates lipogenesis and causes body dehydration, resulting in the excessive and improper storage of fat.
- Smoking result in greater amount of free radical in the body and the contraction of small blood vessels responsible for local microcirculatory impairment. Thus can contribute to the development of GLD.
- Female sex hormone plays a significant role in the development of lipodystrophy.

PATHOPHYSIOLOGICAL STEPS OF CELLULITE DEVELOPMENT¹⁰

Cellulite development is a process which is form by the deposition of fat in an uneven manner and involves following steps:

- Alteration of metabolic reaction in interstitial matrix.
- Damage to collagen fibre.
- An accumulation of free water.
- A reduction in the number of prteoglycons and of HA concentration.
- Alteration in connective structures and the collagen system.
- Development of lipodema and lipolymphodema.
- Disorders in the lipogenesis- lipolysis system.
- And alteration in venous lymphatic microcirculation.

PROPOSED TREATMENT FOR CELLULITE¹¹

Improving diet and exercise is an excellent way to start improving cellulite appearance. There are various treatment for reduction of cellulite. It include-

- ❖ Liposuction
- ❖ Subcision
- ❖ Injectables
- ❖ Endermologie
- ❖ Massage
- ❖ Thermotherapy
- ❖ Topical ointments
- ❖ Iontophoresis
- ❖ Lasers
- ❖ Shock wave therapy

TOPICAL TREATMENT

Cellulite is a complex condition and as a result combination of different ingredients to influence the different aspects of the pathophysiology of the condition is needed. Cellulite is a condition that develops over years and takes several months before any effect to show after treatment¹². Among the potential treatment for improving the appearance of cellulite, topical products are today most commonly used, since they represent easy and non-invasive technique¹³.

TOPICAL THERAPIES FOR CELLULITE, BASED ON MECHANISM OF ACTION¹⁴

Table 1 –mechanism of cellulite formation and agents that help to reduce cellulite.

MECHANISM OF ACTION	AGENTS
Increase the microcirculation flow	Ginkgo biloba Centellaasiatica Ruscus aculeatus

	Papaya (<i>Carica papaya</i>) Pineapple (<i>Ananas sativus</i>) Red grapes (<i>Vitis vinifera</i>) <i>Cynara scolymus</i> <i>Melilotus officinalis</i>
Reduce lipogenesis and promote lipolysis	Methylxanthines :- caffeine, aminophylline
Restore the normal structure of dermis and subcutaneous tissue	Retinol (Vitamin A)
Prevent free-radical formation or scavenge free-radicals.	Alpha-tocopherol (Vitamin E) Ascorbic acid (Vitamin C) <i>Ginkgo biloba</i> Red grapes

Cosmeceuticals represent a new category of products that are intended for the enhancement for both the health and beauty of the skin. These products are found in many forms including vitamins, peptides, growth factor and botanic extract¹².

These are few herbs which help to reduce the formation of cellulite.

1. GINKGO BILOBA

Ginkgo biloba is a member of the *Ginkgoaceae* family. It is being used worldwide as an herbal medicine for various circulatory disorders¹⁵. It is cultivated mostly, in Japan and China. The seeds of the tree contain kernel. The dry kernels contain sucrose, starch, protein, fat, pentosans, fibre and ash. The fruit pulp contains volatile oil and number of fatty acids¹⁶.

Ginkgo biloba has flavonoids, which act as antioxidant and anti-inflammatory agents. The leaf extract contains substances such as flavonoids, biflavones and terpenes. These substances reduce blood viscosity, inhibit the platelet-activating factor, increase red blood cell deformability, diminish vascular permeability and improve vascular wall tone, leading to an improvement in microcirculation and shown to decrease cAMP Phosphodiesterase. In topical formulations, the glycolic extract is used in a concentration of 5-10% and the dried extract in 0.2-2%¹².

2. CENTELLA ASIATICA

Centella asiatica (Linn.) urban belonging to the family *Umbeliferae* popularly known as 'Mandookaparni'¹⁰. A prostrate, faintly aromatic, stoloniferous perennial herb found throughout India. The leaves are used as a vegetable in Kerala. Leaves contain protein, carbohydrate, crude fibre, calcium. The leaves are rich in vitamin B, C and carotenoids¹⁷. *Centella asiatica* accumulates large quantities of pentacyclic triterpenoid saponin. The plant also contains about 0.1% essential oil and other volatile constituents, flavonoids, terpenes, saponin containing triterpene acids and their sugar esters¹⁸.

Centella asiatica extract has been used for cellulite treatment as it purportedly enhances microcirculation and acts as anti-inflammatory agents. It causes decrease in interadipocyte fibrosis¹². In addition to antioxidants such as quercetin, these extracts will contain ursolic acid lactone, ursolic acid, pomolic acid, corosolic acid and marinic acid¹⁹. The ursane and oleanane type triterpene oligoglycosides such as *Centella* saponins B, C and D are also present which decrease subcutaneous

fat thickness, which was related to reduced size of adipocytes²⁰. *Centella asiatica* may be used in a concentration of 2% - 5%¹².

3. RUSCUS ACULEATUS

Ruscus aculeatus also known as butcher's broom belongs to the family "Asparagaceae". The plant is native in the Mediterranean and north Africa up to Asia. Butcher's broom rhizome contains steroid saponin, the aglycone named ruscogenins. It also contain phytosterols and triterpenes²¹. *Ruscus aculeatus* is a potent venous vasoconstrictor. It has flavonoids, that enhances capillary resistance and decrease vascular permeability and edema, which leads to an improvement in lymphatic drainage. The recommended concentration is from 1% to 3%¹².

4. VITIS VINIFERA

Vitis vinifera L. Commonly known as Grape or Wine grape belongs to the family Vitaceae, cultivated mostly in central and southern Europe, northern Africa and western Asia²².

It has analgesic, anti-inflammatory and astringent properties. The sap of young branches is diuretic. It is used as a remedy for skin diseases. Red grapes are very rich in tannins, which increases the permeability of lymphatic and microarterial vessels. The oil obtained from the seed can be used in concentration from 2% to 7%¹².

5. CYNARA SCOLYMUS

Chophytol or Artichoke belonging to the family Asteraceae is an herbaceous perennial crop²³. It is a rich source of bioactive phenolic compound. It is also a rich source of dietary anti-oxidants. It is a good source of protein and also has anti-microbial property²⁴. Artichoke has numerous enzymes, cynarine, ascorbic acid, caffroylquinie acid derivative and flavonoid. It has an antiedema and diuretic effect as well as stimulating effect on the circulation¹².

6. CAFFEINE

Caffeine is obtained from coffee beans. It reduces fat and improves the skin texture. It also protects skin from damage caused by radiation, especially wrinkle formation²⁵. Caffeine is extracted from the coffee beans of coffee Arabica (L) plant. Caffeine acts directly on the adipose cells, promoting lipolysis, inhibiting phosphodiesterase. It activates the triglycerides lipase enzyme and breaks down triglycerides into free acids and glycerol. Caffeine also has a stimulating effect on the cutaneous microcirculation¹². Caffeine, otherwise known as the theine, is a pure alkaloid. The compound is completely absorbed from the gastrointestinal tract and then distributed to the various tissue, depending on their hydration. The caffeine does not accumulate in the human body as it undergoes rapid transformation. Normally used in the concentration of 1%-2%²⁶.

7. HEDERA HELYX

Hedera helix commonly known as IVY belongs to the family Araliaceae. It is a evergreen woody perennial plant. The plant contained unsaturated sterols, tannins, phenolic compounds, terpenoids, glycosides, alkaloids, flavonoids, carbohydrates, reducing sugar and saponins²⁷. Ivy extract are major constituents in slimming products, especially those which combat cellulitis. It has

vasoconstrictor and antiexudative properties and reduces capillary permeability. Ivy extract also activates blood circulation²⁸.

8. ASECULUS HIPPOCASTANUM

Aescin is the major active principle from Aesculus hippocastanum, the horse chestnut tree, a plant widely distributed all over the world because of its excellent resistance to environmental conditions. The seeds of A. Hippocastanum contain saponin mixture from which two crystalline products can be separated 'aescin' and 'prosapogenin'. A number of other products have been isolated from the chestnut seed i.e. bioflavonoid such as quercetin, antioxidants and coumarins²⁷. The parts of the horse chestnut used are the fresh seeds, freed from the seed coat, more rarely the bark from the branches or the fruit walls²⁶.

The action is to strengthen the blood vessels, to prevent thrombosis and to strengthen the veins. The special characteristics of aescin are its effect on capillary permeability. The extract from the seed of the horse chestnut act on the connective tissue barrier between blood vessels and tissue, where nutrients and gases diffuses, inhibiting exudation and the development of oedema and reducing vascular fragility²⁹.

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