

## A Review on Conceptual Study of *Twacha Sharir* (Skin)

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### ABSTRACT

Ayurveda, the “Science of Life”, is a real wealth of medical sciences. In Ayurvedic oldest text *Sushruta Samhita- Shareer sthana*, Acharya Sushruta has mentioned five sensory organs i.e. *Gyanendriyas*. *Sparshanendriya* is one of them whose *adhishthana* is *Twacha* (skin). As we know, skin is the largest sense organ of the body which sense touch, pain, pressure, temperature etc. It is also known as “The First Line of Defence”.

This article has been comprehended by the Etymology, synonyms, *Utpatti*, *Rachnatmaka* and *Kriyatmaka* aspect of *Twacha*, layers of *Twacha*, *Twacha* as *Rogmarga* according to Ayurvedic and Modern aspect. *Twacha* (Skin) is a topic of vast research as we know about the different and mysterious disorders that are arising in this era. So, *Twacha* will be useful in diagnostic, prognosis and therapeutic purpose of various disorders.

**Keywords:** *Sparshanendriya*, *Gyanendriyas*, *Adhishthana*, *Twacha Utpatti*, *Rachnatmaka*, *Kriyatmaka*, diagnostic, prognosis and therapeutic.

### INTRODUCTION

The skin, also known as the cutaneous membrane is the largest organ of the body, with a total area of about 20 square feet and weighs 4.5-5kg, about 7% of total body weight. Skin is known as “The First Line of Defence” as it protects us from microbes and other invading elements. It is a part of integumentary system that contributes to homeostasis by protecting the body and helping regulate body temperature. It also allows us to sense pleasurable, painful and other stimuli in the external environment. <sup>[1]</sup>

Acharya Charaka defines skin as the structure covering the whole body. <sup>[21]</sup> Acharya Sushruta has stated that the thickness of *twacha* is different in different sites of body as in *mamsalsthaana* and *lalaat* the *twacha pramaan* varies. <sup>[4]</sup> Modern science also stated the same concept that skin is thickest on palms and soles of feet while thinnest on eyelids and in post auricular region. <sup>[1]</sup> We know well

about the skin but the details of *Twacha* mentioned in various Ayurvedic Texts are yet to be explained. The knowledge of *Rachnatmaka* and *Kriyatmaka* aspect of *Twacha* is of great importance as *Twacha* is the seat for various *Rogas*.

### MATERIAL

#### Etymology (*Nirukti*) of *Twacha*:

In Ayurveda, skin is stated as *Twak* or *Twacha*. It is included under “*Panch Gyanendriya Adhishthana*.” It has a great capacity of expansion and stretching. *Twacha* is the *adhishthana* of “*Pranadi Panch Vayu*” where *Vayu* resides and bring out its functions. *Twacha* is specialized sense organ which acquires special sensory perception of pain, touch, pressure, heat and cold. <sup>[2a&b]</sup>

#### Synonyms for *Twacha*:

Skin is known by various names like *Derma*, *Dermis*, <sup>[1]</sup> *Twacha*, *Charma*, *Sparshan*, *Chavi*, *Chadani*, *Asrugdhara*, *Romabhumi*, *Ajin*, *Kruti* <sup>[3]</sup> and many more.

### **Twacha Utpatti:**

In Ayurvedic texts, it is stated that the development of *Twacha* (skin) occurs in *Tritiya masa* (third month) of intrauterine life. [22] Different *Acharyas* have different views regarding the development of *Twacha*.

- *Acharya Sushruta* described the development of *Twacha* in *Shareersthana* by taking the example of *Ksheer* and *Santanika*. *Twacha* develops like a layer of *Santanika*(cream) developed on *Ksheer*(Milk) after heating. The formation of *Twacha* results from heat generated in the process of union of *Shukra* and *Shonita* during the *Garbhanirmaana Kala*. [4]
- *Acharya Charaka* states that development of the *twacha* results from the *shukra shonita sanyoga* [5] and the formation of all *sapta dhatu*.
- *Acharya Vagbhata* states that the development of *Twacha* occurs due to *paka* of *Rakta dhatu* by *dhatvagni*. [6]

In Modern texts, it is stated that the development of skin starts at about fourth week after the fertilization. At the beginning of seventh week, the single layer known as the basal layer, divides and forms a superficial protected layer of flattened cells called periderm. By the fifth month, appearance of fatty layer called the vernix caseosa can be seen. By about eleventh week, epidermis and dermis are formed and hair follicles start to grow. The epidermis is derived from ectoderm while the dermis arises from mesoderm located deep to the surface ectoderm. [19]

### **Rachnatmaka aspect of Twacha:**

*Twacha* is the *adhishtana* of *Sparshanendriya* as it carries the sensation of touch because of *Vayu Mahabhuta*. It covers the external part of body including the sense organs. *Acharya Sushruta* mentioned the concept of *Twacha* in *Shareera Sthana* (*Sushruta-shareere-shreshtha*) as *Twacha* has seven layers:

1. *Avabhasini* – The first layer of *Twacha* which provides color to the skin. When

the sunlight falls on this layer, five types of colors and shadows gets reflected i.e. *prabha*. This layer measures about 1/18<sup>th</sup> part of *vrihi* (rice grain). It is *twakroga adhishtana* of *Sidhma*(small ulcers) and *Padmakantaka* (*Pemphigus mollaceus*)

2. *Lohita*– The second layer of *Twacha* which measures about 1/16<sup>th</sup> part of *vrihi*. It is *twakroga adhishtana* of *tila kaalaka*(moles),*nyachchha*(pimples) and *vyanga*(acne vulgaris).
3. *Shveta*– The third layer of *Twacha* which measures about 1/12<sup>th</sup> part of *vrihi*. It is *twakroga adhishtana* of *Charamdala*, *Ajagalli* and *Mashaka*(taenia infection of skin and candidiasis).
4. *Tamra* – The fourth layer of *Twacha* which measures about 1/8<sup>th</sup> part of *vrihi*. It is *twakroga adhishtana* of *Vividha Kilasa* (lepromatous)and *Kustha*(tuberculoid leprosy).
5. *Vedini* – The fifth layer of *Twacha* which measures about 1/5<sup>th</sup> part of *vrihi*. It is *twakroga adhishtana* of *Kushtha* (leprosy) and *Visarpa* (erysipelas).
6. *Rohini* – The sixth layer of *Twacha* which measures about a *vrihi*. It is *twakroga adhishtana* of *Granthi* (varicose veins), *Apachi* (benign tumors), *Arbuda* (tumors), *Shlipada* (filariasis), *Galaganda* (goiter).
7. *Mamsadhara* – The seventh layer of *Twacha* which measures about two *vrihi*. It is *twakroga adhishtana* of *Bhagandara* (fistula-in-ano), *Vidradhi* (abscess), *Arshas* (piles). [4]

*Acharya Charaka* mentioned six layers of *Twacha*:

1. *Udakadhara* – The outermost layer of *twacha* which is exposed to sunlight.
2. *Asrikdhara* – This is the second layer of skin which carries *rakta*.
3. *Tritiya twacha* – The third layer of *twacha* called *Tritiya* is *rogaadhishtana* of *Sidhmakilasa*.
4. *Chaturthi twacha* – The fourth layer of *twacha* called *Chaturthi* is *rogaadhishtana* of *Dadrakushtha*

means light elevation in the skin (macular rash).

5. *Panchami twacha* – The fifth layer of *twacha* called *Panchami* is *rogaadhishtana* of *Alajivradhi*.
6. *Shashthi twacha* – When there is any injury to the sixth layer of *twacha*, then the clinical feature is *Tamahpravisyati*. It is also *rogaadhishtana* of *Arushika*.<sup>[5b]</sup>

### **Kriyatamaka aspect of Twacha:**

In *Kriyatamaka* aspect, to examine the role of skin, we will have to assess the effects of *dosha*, *dhatu* and *malas*.

*Bhrajaka pitta* present in *twacha* is responsible for lusture of the *twacha*.<sup>[8]</sup> The *pittadosha vrddhi* in the body results in yellowish discoloration of the *twacha*<sup>[9]</sup> whereas its *kshaya* results in the loss of lusture of the *twacha*. *Vatadosha vrddhi* in the body results in *karshanyam* (hyperpigmentation) of *twacha* and *kapha vriddhi* causes *shaukalyam*(whitish discoloration) and *shaityam*(coldness of *twacha*).<sup>[15]</sup> *Kapha kshaya* results in *rukshata*(dryness).<sup>[16]</sup>

According to *Acharya Charaka*, *twacha* is the *mula* of *mamsavahasrotas*<sup>[10a]</sup> and *updhatu* of *Mamsadhatu*.<sup>[10b]</sup> *Rasa*<sup>[11]</sup> and *Rakta*<sup>[12]</sup> *dhatu* are indirectly related to *twacha*. While describing the *Ashtasaarpurush*, *Acharya Charak* considered *Twaksaarpurush* instead of *Rasasaarpurush*.<sup>[17]</sup> *Vitiation* of *Rakta Dhatu* leads to skin diseases like *Visapra*, *Kustha*, *Vyanga* etc. while in *kshaya* of *Rakta dhatu* in the body results in *twakaparushyam* (rough skin).<sup>[18]</sup> The presence of *shudh Shukra*<sup>[13]</sup> in the body is also reflected by the lusture of the *twacha*.

The skin retains water and keeps itself moist. Thus presence of *sweda* indicates that it is *mala* of *twacha* which is essential for maintaining the moisture content, tonicity and elasticity of the skin.<sup>[14a]</sup> *Sweda kshaya* results in dryness and cracks in the skin whereas *Sweda vrddhi* results in pruritus.<sup>[12,14a,b]</sup>

### **Twacha as Rogmarga:**

*Acharya Charaka* describes *Bahya*, *Madhyamand* *Abhyantara* as three *Rogmargas*. *Twacha* is included in *Bahya Rogmarga* as it is outermost layer and first line of defence and every element in external environment will come in contact with *twacha* first.

### **Modern aspect of Skin:**

Of all the body's organs, none is more easily inspected or more exposed to infection, disease and injury than the skin. Because of its visibility, skin reflects our emotions and some aspects of normal physiology. Changes in skin color may also indicate homeostatic imbalances in the body.<sup>[1]</sup>

### **Layers of skin:**

Modern texts have classified the skin into two main parts:

1. The superficial, thinner portion, which is composed of epithelial tissue, is the Epidermis.
2. The deeper, thicker *connective tissue* portion is the Dermis.

The Epidermis is avascular and the Dermis is vascular, that's why, by cutting the layer of epidermis there is no bleeding, but if we cut the dermis there is bleeding.

Deep to dermis, but not part of skin, is the subcutaneous layer, known as the Hypodermis. This layer consists of areolar and adipose tissues.<sup>[1]</sup>

The Epidermis is further grouped into five layers:<sup>[20a]</sup>

1. Stratum Corneum or Horny Layer
2. Stratum Lucidum
3. Stratum Granulosum
4. Stratum Spinosum or Malpighian Layer
5. Stratum Basale or Germinative Layer

The Dermis is further divided into two regions:<sup>[20b]</sup>

- I. Papillary region
- II. Reticular region

### **Functions of skin:**

1. Thermoregulation: The skin contributes to regulation in two ways: by liberating sweat at its surface and by adjusting the flow of blood in the dermis. In response to high temperature, sweat production

from eccrine sweat glands increases; the evaporation of sweat from the surface of skin helps to lower the body temperature.

2. **Blood Reservoir:** The dermis houses an extensive network of blood vessels that carry 8-10% of the total blood flow in a resting adult. For this reason, the skin acts as a **blood reservoir**.
3. **Protection:** The skin protects the body in various ways. Keratin protects underlying tissues from microbes, abrasion, heat and chemicals. Lipids released from the lamellar granules inhibit evaporation of water from skin surface. The oily sebum from the sebaceous glands keeps hair and skin from drying out and contains bactericidal chemicals
4. **Cutaneous sensations:** These sensations arise in the skin such as touch, pain, pressure, vibration, tickling and thermal sensations like warmth and coolness.
5. **Excretion and absorption:** Despite the waterproof nature stratum corneum, about 400mL of water evaporates through skin daily. Fat soluble vitamins (A,D,E,K), certain drugs and few gases do enter and exit the skin.
6. **Synthesis of Vitamin D:** Synthesis of vitamin D requires activation of precursor molecules in the skin by U.V rays in sunlight. Enzymes in the liver and kidney modify the activated molecule, producing *calcitriol*, the most active form of Vitamin D. <sup>[20c]</sup>

#### **Clinical conditions:**

- In Ayurvedic Literature, skin diseases are described under “*KusthaRoga*”. These are of two types-
  - a) *Maha Kustha*
  - b) *Chhudra Kustha*
- In Modern Literature, variety of skin disorders have been discussed. Some are:
  - **Skin lesions and eruptions:** Several skin lesions are observed in various dermatological disorders such as:

Vesicles, plaques, scales, nodules, papules and patches.

- **Color and pigmentation:** Following changes in the skin color indicates few systematic conditions:
1. Pallor: Anemia, Hemorrhage and shock.
  2. Pale: Hypopituitarism, Hypogonadism.
  3. Albinism: Congenital absence of haemosiderin pigment.
  4. Cyanosis: Lack of oxygen supply to blood vessels.

#### **Correlation of Layers of Twacha:**

The details regarding the layers of skin according to Ayurveda and Modern science is still confusing. But the correlation of *Ayurvedokta Twacha Stara* with modern sciences as per mentioned by *Ghanekar*, <sup>[7]</sup> the commentator of *Sushruta Samhita Shareersthana*, which is as follows:

*Avabhasini*- Stratum corneum

*Lohita*- Stratum Lucidum

*Shveta*- Stratum Granulosum

*Tamra*- Malpighian Layer

*Vedini*- Papillary Layer

*Rohini*- Reticular Layer

*Mamsadhara*- Subcutaneous tissue

#### **CONCLUSION**

This detailed study of *Twacha Shareer* in both Ayurvedic and Modern sciences provided well established concept of *Twacha* (skin) in medical science. To know about the *Vikriti* of *Twacha*, it is necessary to know the normal physiology i.e. *Prakriti* of the *Twacha*. Thus, in medical science, for better diagnosis, detailed study of *Twacha* as per Ayurveda in *Rachnatmaka* and *Kriyatmaka* aspect as well as Modern concepts are necessary.

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