



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

GLIMPSES ON TWACHA SHAREERA

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ABSTRACT

In ayurveda skin is called *Twacha* which encloses the whole body. Study of *Twacha* is important, as it is seat for all *Twak Rogas*. Our *Twacha* integrates the whole body “Under one Roof”. *Twacha* senses pain, temperature and pressure. It is prone to injuries both externally and internally. Sushruta Samhita *Shareera Sthana*, Sushruta has mentioned five sensory organs i.e *Gyanendriyas*. *Sparshanendriya* is one of them whose *adhishtana* is *twacha*. This article emphasis on the etymology, synonyms, Utpatti, functions of *Twacha*, its correlation with skin, with reference to anatomical and physiological aspect, description of *Twacha* and its thickness is present in both sciences, so an attempt is made in this article to brief look on the *Twacha*.

Key words – *Twacha*, *gyanedriyas*, Skin.

Introduction

Ayurveda is science of life and its main aim is to maintain healthy living being, i.e prevention of disease and treatment of disease. As per Ayurvedic science, *shareera* is made up of *dosha*, *dhatu*, *upadhatu*, and *mala*. *Twacha* is measured as *upadhtu* of *mamsadhatu*. *Twacha* is one among the five *gyanendriyas*. It is base of *sparshanendriya*. Skin the largest organ of human body, holds significant prominence in maintaining normal human physiological condition *Twachapariksha* is also explained among eight tools of *Asthavidha pareeksha*.

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 weight 4.5 -5kg, about 7% of the 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 the sense pleasurable, painful and other stimuli in the external environment.

ETYMOLOGY OF TWACHA

The word *Twacha* is derived from “*Twack Samvarane Dhatu*” along with *Tap Pratyaya* which means covering the body.¹

Definition

The part of body which completely covers *Meda*, *Shonita* and other *dhatu*s and which spreads over are called *Twacha*.²

Synonyms of *Twacha*

Charma, Sparshana, Chavi, Chadani, Asrugdhara, Ajina, Kruti.

Formation of *Twak*:

Acharya Sushruta has described the process of formation of *Twak* in the developing foetus after *Shukra Shonita Samyoga Twacha* develops just like formation of a creamy layer in the upper most portion when milk is boiled.³ According to *Vagbhata*, the *Sapta Twacha* are produced during the *Paka* of *Rakta Dhatu* by its *Dhatvagni* in the foetus. After the *Paka*, Formation of *Twacha* occurs just like the deposition of cream over the surface of boiled milk.⁴ *Vagbhata* mentioned that the skin becomes fully developed during 6th month of intrauterine life. According to *Charaka*, *Twak* is derived from maternal source (*Matruja Bhava*) which is one of the six *Bhavas* essential in the development of foetus.⁵

Maharshi Kashyapa states *Sparshendriya* is derived from *Vayu*.⁶ *Twacha* is the *upadhatu* of *mamsa*.⁷

Layers of *Twacha*.

There are some differences of opinion between the ancient Acharyas regarding layers of skin.

Layers of the *Twacha* according to *Acharya Charaka*.

Charaka described six layers of Skin among which he has named only two layers and the remaining four layers were described in terms of the diseases.⁸

No	Layers	Name of the Layers
1	<i>Pratham</i>	<i>Udakadhara- Bahyatwak</i>
2	<i>Dviteeya</i>	<i>Asrigdhara</i>
3	<i>Triteeya</i>	<i>Sidhma, Kilasa Sambhavadhishтана.</i>
4	<i>Chaturta</i>	<i>Dadru, Kushta Sambhavadhishтана.</i>
5	<i>Panchami</i>	<i>Alaji, Vidradhi Sambhavadhishтана.</i>
6	<i>Shashti</i>	<i>Injury leads- Kampa & Tamodarshan.</i>

Layers of the Skin according to *Acharya Sushruta*

Whereas *Acharya Sushruta* Specifies the names of all the seven layer along with its thickness and the peculiarities of Disease of the concern layer as

Sushruta and *Dalhana* mentioned that 5th layer is *Adishtana* for *Sarva Kushta*.⁹

SL.NO	Name of the layers	Thickness	Disease
1	<i>Avabhasini</i>	<i>1/18th of Vrihi</i>	<i>Sidma, Padmakantaka</i>
2	<i>Lohita</i>	<i>1/16th of Vrihi</i>	<i>Tilakalaka, Nyachha, Vyanga</i>
3	<i>Shvetha</i>	<i>1/12th of Vrihi</i>	<i>Charmadala, Ajaagalika, Mashaka</i>
4	<i>Tamra</i>	<i>1/8th of Vrihi</i>	<i>Kilasa and Kushta</i>
5	<i>Vedini</i>	<i>1/5th of Vrihi</i>	<i>Kushta and Visarpa</i>
6	<i>Rohini</i>	<i>1 Vrihi</i>	<i>Arbuda, Galaganda, Apachi, Shleepada</i>
7	<i>Mamsadhara</i>	<i>2 Vrihi</i>	<i>Bhagandara, Vidradi, Arsha.</i>

According to *Vagbhata* & *Sharangadhara* has described there are seven layers of skin like that of *Sushruta*. He advocates the origin of all types of *Kushta* in 4th layer of *twacha*. (*tamra*). *Sharangadhar* advocates is in 5th layer except the seventh layer the name it as *sthula* and is the place of *Vidrathi Vyadhi*.¹⁰

According to *Sharangdhara* has also mentioned seven layers of skin along with the probable onset of diseases. The names of first six layers are same as *Sushruta* the location of all types of *Kushta* in 5th layer of *Twacha* (*Vedini*).¹¹

According to *Kashyap* & *Bhela* mentioned 6 layers of *Twacha*.

Panchabhautiktva of Skin.¹²

Acharya Charaka described *Panchabhautiktva* of *Twacha* as follows.

Prathvi- Twacha is *Parthiva Avayava*.

Jala- Mruduta and *Snigdhatta* of *Twacha* are due to *Jala Mahabhuta*.

Teja- Abha and *varna* of skin is due to *Teja mahabhuta*.

Vayu- Twacha is *sparshanendriya Adisthana* which *Vatadhisthana*.

Akasha- Svedavahi srotasa is indicative of *Akashamahabhuta*.

It is the *indriya* which have predominance of all the *Panchamahabhutas* as like *Netra* explained by *Charakaacharya* based on *Gunas* present in *Twacha*

Functional aspect of Twack.

Relation of *Twacha* and *Dosha*.

Acharya Vagbhata has explained that *Sparshana Indriya* as one of the *Adhisthana* of *Vayu*.

Acharya Vagbhata says that *Bhrajaka Pitta* is in *Twacha*.¹³

The word *Bhrajana* is *Prakashana* or *Deepana* i.e imparting lustre to skin. It does *Pachana* of *Abhyana*, *Parisheka* and *Lepa*. Because of *Kapha*, *Sneha* and *Sthirata* are present in skin.

Relation of Twacha and Dhatu.

In the context of *Twak sara Purusha Lakshana*, its said that as *Rasa Sara* 1st layer of *Twacha* that is *Udakadhara* also contains *Rasa*, so it is considered that there is relation between *Twacha* and *Rasa*.¹⁴ While mentioning the function of *Rakta*, *Varna Prasadana* and *Mamsa Pushti* have been mentioned. In *Raktha Vruddi*, *Twacha* will be *Rakta Varna*. *Twak* is the *Upadhatu* of *Mamsa*.

Relation of Twacha and Mala

Sweda is the *Mala* of *Meda* which excreted by *Twacha*. Function of *Sweda* is *Twak Saukumaryata*. And *Kleda Vidhruti*. *Acharya Vagbhata* explained during *sweda kshaya*, there will be *Sphutana* of *Twacha*. *Twakgata Sneha* is the *mala* of *majja Dhatu* according to *Acharya Sharangadhara Twak Sneha* and *Yauvanapidaka* is the *Mala* of *Shukra Dhatu*.

Realtion of Twacha and Indriya

Acharya Charaka explained that *Twacha* is the *Adhisthana* for *Sparshnendriya*, *Indriya Dravya* is *vayu* and *Sparsha* is *Indriya Buddhi*.

Srotomula

Twacha is the moola of *Mamsavaha Srotas* and *Loma* is the *Moola* of *Swedavaha Srotas*. *Twacha* is place where the medas will get or present along with the Lomakupas so it may be considered one of the component of *Swedavaha Srotas*.

Correlation of Layer of *Twacha*¹⁵

The correlation of *Ayurvedokta Twacha* with modern sciences as per mentioned by Ghanekar. The commentator of *Sushruta Samhita Shareera stana* 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.

SKIN

Skin is the largest organ which compromises 16% of the body weight, surface area 1.8m². It is important to understand the structure of skin to understand the pathology.

Development of Skin

All components of skin is evident by 12 weeks early development.¹⁶ Foetus skin development occurs in 3 stages Specification, Morphogenesis, and differentiation. Its Specification occurs from 0-60 days, Morphogenesis from 2-5 months and differentiation from 5 to 9 months.¹⁷

Embryology of Skin:¹⁸

Skin has structures derived from different sources:

1. Epidermis, Hair follicles, sweat glands, Sebaceous Glands are derived from Ectoderm.
2. Dermis, Arrectores, Vessels, Nerves, are derived from mesoderm.
3. Subcutaneous fat, Langerhans cells are derived from Mesenchyme.
4. Melanocytes are derived from Neural crest.

Chronology of Development of Skin.

Epidermis develops from 4-7 weeks.

Nail develops from 10 weeks.

Dermis develops from 11 weeks Sweat glands develops from 12 weeks.

Primitive hair structures develop from 12 weeks.

Melanocytes develops from 12 weeks.

Dermo epidermal junction develops from 12 weeks.

Fingerprints develops from 17 weeks.

Structure of skin:¹⁹

Skin has 3 layers:

1. Epidermis
2. Dermis
3. Subcutaneous Fat (Hypodermis)

1.Epidermis: The Epidermis is approximately 0.4 mm to 1.6 mm thick. The cells most present in the epidermis are keratinocytes. Cells are organized into 5 layers. stratum corneum, stratum lucidum, stratum granulosum, stratum spinosum, stratum basale or stratum germinate. The stratum corneum is the outermost layer containing flattened nucleated cells without cellular organelles. Th thick epidermis of the palms and soles has an extra layer under the stratum corneum that is electron- permeable and called the stratum lucidum. The stratum granulosum is so named due to the presence of intracellular basophilic keratinocytes granules and consist of 2-5 cells layers. The stratum spinosum contains 8-10 layers of polyhedral cells with round nuclei. The Basal stratum consists of a single layers of cuboid cylindrical cells. Other member cells found in the epidermis are melanocytes, Langerhans cells and Merkel cells.

2.Dermis: The dermis is composed of connective tissue that contains collagen fibers, elastic fibers, and a matrix of proteoglycans and glycosaminoglycans. Their thickness varies from about 1mm to 4mm on the back and thighs. Collagen fibers are the main components of the dermis.

The dermis is structurally divided into two regions

The surface area adjacent to the epidermis is called the papillary zone.

A deeper thicker area known as the reticular area.

Papillary Region: The papillary region consists of loose areolar connective tissue it is named for its finger-like projection called papillae. Which extend up to the epidermis. Area reticularis. The area reticularis is located deep within the papillary area and is usually much thicker. It is made up of dense, irregular connective tissue.

3.Hypodermis: It is not part of the skin and is found under the dermis. Its purpose is to attach the skin to the underlying bones and muscle and supply them with blood vessels and nerves. It is composed of loose connective tissue, adipose tissue, elastin, blood vessels, lymphatic nerve fibers.

Appendages of skin.

Sweat Glands: Humans have several millions sweat glands spread all over the surface of the body. Each sweat gland consists of a secretory spiral deep in the subcutaneous tissue and a duct that carries secreted sweat to the surface. The sweat produced by the coils is transported through the ducts. There are 2 types of sweat glands, namely eccrine sweat glands and apocrine glands.

Eccrine sweat glands:

They are tubular structures that open directly on the skin and consist of 3 segments. The secretion coil, straight intradermal part, Coiled or spiral intradermal part.

Apocrine sweat glands: They are specialized sweat glands distributed along the mammary line. These tubular glands consist of 2 main parts the tortuous secretory gland and the straight excretory duct.

Pilosebaceous unit: The hair and the sebaceous gland form pilosebaceous unit. Therefore, both structures are often involved in many skin diseases such as acne vulgaris.

Hair: Hair is structurally made up of cuticle, cortex and medulla. Hair grows at a rate of 0.3 mm per day and goes through a growth cycle. These recurring cycles consist of anagen, catagen, Telogen phases.

Sebaceous glands: The sebaceous glands are lipid -secreting holocrine glands found on all areas of the skin except the palms, soles and back of the feet. The maximum density is in the scalp, face, upper chest, etc. They are activated under the influence of androgen hormone. The sebaceous glands secrete a greasy secretion rich in fatty substances.

Nails: Its yet another epidermal appendage. The main part of this appendages is hard nail plate the arises from the nail matrix.

Functions of skin: Protective functions, Thermoregulation, sensation, storage and synthesis, Excretion, Percutaneous absorption, Immunological components of skin, Melanocyte.

MATERIALS AND METHODS

Necessary information regarding *Twacha* and integumentary system is collected by *Samhitas*, compiled textbooks, modern literature different articles etc.

DISCUSSION

Twacha is also explained under *Asthavidha Rogi Pariksha*, thus by examining the *Twacha* we can have a fair idea of the disease.

The outermost layer *Avabhasini* is responsible for colour and 5 types of shadows i.e Prabha and it is seat of psoriasis, pimples, acne, and correlates with Horne layer of epidermis.

Lohita is second layer it outermost layer and it is moles, dark circles, black pigmentations and correlates with stratum Lucidum layer of epidermis.

The Third layer *Shweta* provides balance to skin colour and seat of atopic dermatitis, eruption or blisters, moles and correlates with stratum granulosum layer of epidermis.

The Fourth layer *Tamra* supports the immune system and seat of leprosy and correlates with Malphagian layer of dermis.

The Fifth layer *Vedini* is centre for transformation of sensation and seat of leprosy and herpes and correlates with papillary layer of dermis.

The Sixth layer *Rohini* supports healing and regeneration and seat of cysts, scrofula or lymphadenopathy, cancer, tumours, elephantiasis, goitre and correlates with Reticular layer of dermis.

The Seventh innermost layer *Mamsadhara* is the platform for the skin's stability and firmness and seat of fistulas, abscess, haemorrhoids and correlates with subcutaneous tissue and muscles. Sense of touch carried out through skin by Vata dosha. *Bhrajaka* pitta gives colour to the skin.

According *Acharya Sushruta* there are seven layers of skin, namely as *Avabhasini*, *Lohita*, *Shweta*, *Tamra*, *Rohini*, *Mamsadhara* whereas *Acharya Charaka* mentioned them as *Udakadhara*, *Asrukdhara*, *Trutiya*, *Chatuta*, *Panchami* and *shasti*. Sushruta mentioned the measurement of seven *Twacha* layer from 1/18 to 2 vrihi.

Classical texts and modern texts have different opinion about skin. But they both describe the layers, pigments and thickness of skin. More over classical text describes the diseases which occurred in particular layer of skin.

CONCLUSION

The skin called *Twak* which encloses the whole body.

The layer wise distribution of *twak* described in ayurvedic science seems to have close resemblance with skin layers described by the modern science. Layer wise diseases of skin stands to be more perfect for diagnosis of skin diseases described in the ayurvedic science many years before as compared to modern sciences.

Understanding the skin diseases with this type of detailed study about *twak shareera* in (anatomy and physiology) of skin from both ayurvedic and modern science is significantly resourceful.

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