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# *Rachanatmak* and *Kriyatmak* Review of *Twacha* in Ayurveda with Reference to Skin

Nilkanth Upadhyaya,<sup>1</sup> Sarika Yadav,<sup>2</sup> Chhaju Ram Yadav<sup>3</sup>

- 1. PG Scholar, PG Dept. of Kriya Sharir, National Institute of Ayurveda, Deemed to be University, Jaipur, India
- 2. Assistant Professor, Dept. of Kriya Sharir, National Institute of Ayurveda, Deemed to be University, Jaipur, India
- 3. Associate Professor and Head of PG Dept. of Kriya Sharir, National Institute of Ayurveda, Deemed to be University, Jaipur, India

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#### Corresponding author-

Dr. Nilkanth Upadhyaya, PG Scholar, PG Dept of Kriya Sharir, National Institute of Ayurveda, Deemed to be University, Jaipur, India <u>Email- nupadhyaya19@gmail.com</u>

# **ABSTRACT:**

Ayurveda, the world's utmost ancient science of life, focuses on preventing disease along with treating it. In Ayurveda, Twacha is described as outermost covering and protective layer of the body. Acharya Charaka describes Twacha is the Mula of Mamsavaha Srotas and Upadhatu of Mamsa Dhatu. Twacha is the Adhishthana of Sparshanendriya. Ayurveda describes six or seven distinct layers of the skin, each with its own structure and function. The layers are designed in such a way that each one supports the layer above it. In Ayurvedic classics, various opinions regarding Twacha Uttapati, Twacha Stara and associated disorders are mentioned The seven layers of Twacha proclaimed by Sushruta, corresponds perfectly with the seven skin layers, accepted by western medicine also. Acharya Charaka describes six layers of Twacha and named first two layers while remaining four layers have been described in the term of disease in particular layer. Twak is a reflector of the total health and well-being of an individual. The incidence and impact of diseases of skin are increasing day by day. Disease conditions of Twak cause physical, mental, social and spiritual disharmonies in a person. Hence the necessity of detailed study and analysis of the concept of the Twacha, its Rachanatmak and Kriyatmak aspect is of utmost importance and immense necessary.

KEYWORDS: Sapta Twacha, Skin, Sharir Rachana, Kriya Sharir, Diseases

# INTRODUCTION

In Ayurvedic text, extensive description of *Twak* is available, mainly in the *Rachana Sharir* (Anatomy), *Kriya Sharir* (Physiology), *Vikritivingnana* (Pathology) and *Chikitsa Vingnana* (Clinical Medicine). Twak, the human skin is the outermost covering of the body and largest organ in both surface area and weight.<sup>[1]</sup> *Twacha* is derived from "*Twach Samvarane*" *Dhatu* meaning the covering of the

body. In different Ayurvedic texts, *Twak, Twacha* or *Charma* word is used for skin. Different Acharya have given different theory regarding *Twacha Uttapati, Twacha Stara and Twacha* related diseases. Skin is one of the five *Gyanindriya*, measured as *Upadhatu* of *Mamsa Dhatu*.<sup>[2]</sup> It is responsible for Sparsha Gyan(touch sensation). Skin is taken as First Line of Defense because skin provides a protective barrier against thermal, mechanical, physical



injury reduces harmful effects of UV radiation and acts as immune organ and helps in the production of vitamin D.<sup>[3]</sup> Skin is the nature's dressing over the body and primarily responsible for a person's external appearance. Healthy or diseased condition of skin has a significant impact on one's personality which is worth more in this era and especially in adolescent age. It is also most crucial site for expression and manifestation for most of the diseases. Presently, skin conditions contributed 1.79% to the global burden of diseases.<sup>[4]</sup> To know about abnormalities of skin, one must have to knowledge about normal structure and functions of skin in detail and this can be achieved by knowledge of Sharir Rachana, Kriya Sharir, Vikritivingnana (Pathology) and Chikitsavingnana (Clinical Medicine). Ashtavidha Pareeksha mentioned by Yogratnakar also included Twacha Pareeksha.<sup>[5]</sup>

# AIM AND OBJECTIVES

- 1) To study the Anatomical and Physiological concept of *Twak Sharir*.
- To study the different views of Twak Sharir with layers of skin as explained in different classical texts and modern literature.
- 3) To study the various *Twacha Roga* and its correlation with the various layers of *Twacha*.

# MATERIAL AND METHODS

This study is carried out mainly by literature research. Literature was review from different *Ayurvedic* classics -*Charaka Samhita, Sushruta Samhita, Ashtang Hridayam, Sharagndhar* etc., Modern Anatomy text books, Journals and different published research article, and then the critical analysis was done and has been presented in systematic way.

# **CONCEPTUAL REVIEW:**

# RACHANATMAK (ANATOMICAL) REVIEW OF TWACHA

In the fetal life, seven layers of skin are formed and deposited on rapidly growing embryo in the same manner as layer of cream are formed on the boiling milk.<sup>[6]</sup> Different *Acharya* have given different opinions regarding the number of layers of skin.

# Uttapati/Formation of Twak

In *Ayurvedic* texts, it is stated that the development of *Twak* (skin) occurs in *Tritiya Masa* (third month) of intrauterine life. *Twak* is the *Upadhatu* of *Mamsa Dhatu*.<sup>[7]</sup> After union

of *Shukra* and *Shonita*, fertilization occurs and *Garbha* is formed. *Acharya Sushruta* described the origin of *Twacha* in the developing fetus like in a similar fashion as a layer of cream develops over the boiled milk; the seven layer of *Twacha* is develop after the fertilization of *Shukra* and *Shonita*<sup>[8]</sup> *Acharya Charaka*, opines that the six layers of the *Twak* are formed from the *Mamsa Dhatu* results from the *Shukra Shonita Samyoga*<sup>[9]</sup> and it is nourished by *Matruja Bhava*.<sup>[10]</sup> *Vagbhata* states that the *Twak* is formed from the *Rakta* after the *Paka* of *Rakta Dhatu* by its *Dhatwagni* then it gets dried up to form the skin.<sup>[11]</sup>

Modern View<sup>[12][13]</sup>: Skin is derived from three components i.e. surface ectoderm, underlying mesoderm and neural crest cells. Epidermis, derived from the surface ectoderm and dermis is the deeper layer arises from mesoderm called mesenchyme. During second month, epidermis is presented two layers, a superficial layer called periderm/epitrichium and deeper layer cells called basal/germinative layer. During third to fifth month, due to the proliferation of basal layer, the epidermis becomes typical stratified squamous epithelium consisting of five layers of strata- stratum germinativum, stratum spinosum, stratum granulosum, stratum lucidum and stratum corneum. After fifth month, the periderm disappears and the stratum corneum is formed. Proliferation of stratum germinativum extends into the developing dermis as epidermal ridges. They appear by 11th week and become permanent by 18th week and at birth, all the layers of adult epidermis are present.

The melanoblasts/dendritic cells of the epidermis are derived from neural crest and invade the epidermis during 3<sup>rd</sup> month. Melanoblasts cells synthesis melanin pigments. Cells of Merkel and Langerhans cells appear in the epidermis between 8 weeks and 12 weeks of intrauterine life.

**Dermis:** - Dermis is formed by condensation and differentiation of mesenchyme underlying the surface ectoderm. By 11<sup>th</sup> week mesenchyme cells begin to produce collagen and elastic fibers. During 3<sup>rd</sup> and 4<sup>th</sup> month, the epidermal ridges form and projects into the dermis. The portion of dermis intervening between these projections forms the dermal papillae. Further dermis differentiates into two layers- a superficial papillary layer and a deep reticular layer. Sensory nerve ending, tactile receptors and vascular elements develop in the ridges.

**Synonyms of Twak**: Twacha, Asrukdhara, Chamdhi, Dehacharma, Chali, Shariravaranam, Sparshan.

*Twacha Uttpati* Kaal: During intrauterine life, *Twak* are formed from *Mamsa Dhatu* as same as that of *Mamsa Dhatu* formation. *Sushruta* opine that *Twak* is formed on 10th day of intrauterine life<sup>[14]</sup> whereas *Charaka* says on 3<sup>rd</sup> day. *Vagbhata* opine that in the sixth month of intrauterine life, the *Snayu, Sira, Roma, Bala Varna, Nakha* and *Twacha* development occurs.<sup>[15]</sup> As per modern science all layers of skin is formed in fourth month of intrauterine of life.

#### Layer of Twak

Acharya *Charaka* has mentioned six layers of *Twacha*. He named only first two layers while rest four layers have been described in the term of disease in particular layer.<sup>[16]</sup> (Table 1)

*Acharya Vagbhata* describes the layer of skin same as *Acharya Sushruta* except the sixth layer. He named this layer as *Pranadhara*.<sup>[18]</sup> *Sharangdhara* has also named the layers of skin according to *Acharya Sushruta*, except seventh layer. He named this layer as '*Sthoola*' the site of *Vidradhi*. *Acharya Bhel* agree with *Acharya Charaka* about the layers of skin<sup>[19]</sup>.

#### KRIYA SHARIR (Physiological Aspect) OF TWAK:

*Dosha, Dhatu* and *Mala* are the basic structural and functional unit of the body and here we will have to assess the effects of *Dosha, Dhatu* and *Mala* on *Sharir*.

#### Twacha and Vata Dosha

*Twacha* is one of the sites of *Vata Dosha*. Twacha occurs as a *Sparshanendriya* and *Sparsa*(touch) sense is as a *Twagindraya Grahya Vishaya* which is performed by *Vata Dosha*<sup>[20]</sup> *Vata Dosha Vrddhi* results in *Karshanyam*(hyperpigmentation) of *Twacha*.

#### Twacha and Pitta Dosha

*Acharya Sushruta* was the first *Acharya* to describe *Bharjaka Pitta* and *Bharjaka Agni. Bhrajaka Pitta* helps in production of heat in the body, all types of complexions of *Twacha* and 5 types of *Chaya*<sup>[21]</sup>. Different skin application like Paste, Ointments etc. are digested and absorbed through skin due to *Bhrajaka Pitta*. Also, *Pitta Dosha* is responsible for *Prakrita* and *Vaikrita Varna* of *Twacha* in its normal & abnormal state.<sup>[22]</sup>

#### Twacha and Kapha Dosha

Kapha keeps adequate moisture in the Twacha by its

*Snigdhata, Shlakshanata, Mruduta, Sheetata, Prasannata* attributes. *Kapha* is one of the most responsible factor for *Ropan* Karma of *Twacha*.

#### Twacha and Dhatu

*Rasa Dhatu* is present in our body in the form of Fluids. *Rasa* keeps skin fresh. The first layer of skin is *Udakadhara* which maintains the water content of the skin.<sup>[23]</sup> *Rakta Dhatu* helps in *Varna Prasadana*.<sup>[24]</sup> Vitiation of *Rakta Dhatu* leads to different skin diseases like *Sidhma*, *Kustha*, *Tilkaalaka* etc. *Twacha* is the *Mulasthana* of *Mamsavaha Strotas* and *Upadhatu* of *Mamsadhatu*. *Mamsa Dhatu* helps in *Lepana* of *Sharir*.<sup>[25][26]</sup> *Shukra Dhatu* in the body is reflected by the *Lusture* of the *Twacha*. *Acharya Charaka* considered *Twaksaarpurusha* instead of *Rasasaarpurush* in *Ashtasaarpurusha*.

#### Twacha and Mala

*Sweda* is *Mala* of *Meda Dhatu* which is excreted by *Twacha*. *Sweda* maintains the *Lusture* and humidity of skin.<sup>[27]</sup> *Mala is* also responsibe for *Snigdhta* of *Twacha* and maintenance of *Roma* and *Kupa*.<sup>[28]</sup>

#### Twacha and Indriya

According to the *Panchapanchaka*, *Twak* is the seat of *Sparshanendriya* (Tactile Sensory Organ) and *Sparshaja Buddhi* is located in *Brahma Hradaya* (Brain).<sup>[29]</sup> *Twacha* carries the sensation of touch because of *Vayu Mahabhuta*.

#### Twacha and Udaka

Substances of the body can be measured by volume taking *Anjali* as a unit. The water situated in the skin is 10 *Anjali*. By this water, *Dhatu*, Blood etc. are nourished.

#### Twacha and Varna

*Tejas* element is the causative factor of complexion of skin and it is predominately associated with *Aap* element. *Gaur* complexion of fetus is appeared due to *Aap* elements and predominance in *Pruthvi* element causes *Krushna* Varna. Some say that diet of whatever color is used by the pregnant women, the progeny becomes of the similar complexion.

#### Chaya and Prabha

*Chaya* and *Prabha* are concepts of Ayurveda. *Chaya* can be seen from close distance but *Prabha* can be seen from a long distance. Different *Panchamahabhuta, Dhatu, Dosha* etc. helps in maintenance of *Chaya* and *Prabha* of skin.

# SKIN ACCORDING TO MODERN:<sup>[30]</sup>

The skin, also known as the cutaneous membrane covers the external surface of the body and is the largest organ of the body in both surface area and weight. Thickness of the skin is different according to maturation, aging and regional specialization. Over most of the body, it is 1-2 mm thick. Skin is a fascinating organ as it forms a self-renewing and self-repairing interface between the body and its environment. Within in limit, it forms an effective barrier against microbial invasion; protect against mechanical, chemical, cosmetics as well as thermal changes. Structurally, skin consists of two main parts:

**Epidermis-** Superficial, thinner portion, composed of epithelial tissue

Dermis- Deeper and thicker portion, composed of connective tissue part

Epidermis: Top layer of the skin, acts as the protective covering of the body. Cell renewal process takes place in epidermis. Different cells like Keratinocytes(for protection), Melanocytes(for melanin synthesis), cells(for immune responses), Markel Langerhans cells(mechano receptors) etc. are found in epidermis. This epidermis is further grouped into five layers.

- 1. **Stratum corneum-** Horney layer, mostly contain keratin, help to protect deeper layer from injury and microbial invasion.
- 2. **Stratum lucidum-** present only in the thick skin of the fingertips, palms and soles. Contains large amounts of keratin and thickened plasma membrane.
- 3. **Stratum granulosum-** contain keratohyalin protein, marks the transition between deeper, metabolically active strata and the dead cells of the more superficial strata.
- 4. **Stratum spinosum-** consists 5 to 12 layers of polyhedral keratinocytes connected to each other by intercellular bridges.
- 5. **Stratum basale(germinativum)-** having important role in forming new cells. Melanocytes, Langerhans cells and Merkel cells with their associated tactile discs are scattered on the keratinocytes of basal layer.

**Dermis:** It is the connective tissue layer binds to the epidermis, contains tough connective tissue, hair follicles, and sweat glands. The dermis is further divided into two regions

**1. Papillary region-** This layer filled with loose irregular connective tissue and connective tissue fibers, capillaries,

blood vessels, fibroblast, macrophage etc.

**2. Reticular layer-** Thicker and contains dense irregular connective tissue.

The deeper subcutaneous tissue (hypodermis) is made of fat and connective tissue that houses larger blood vessels and nerves. It helps in the regulation of temperature of the skin itself and the body.<sup>[31]</sup>

# **DISCUSSION:**

In Ayurveda, Twacha is described with a holistic approach and all aspects relevant to Twacha are elaborated magnificently. Both classical texts and modern texts have different opinion about skin and both describe the thickness, pigments and layers of skin. Moreover classical text describes the diseases which occurred in particular layers of skin. Seven layers of Twacha namely; Avabhasini, Lohita, Sweta, Tamra, Vedina, Rohini, & Mamsadhara respectively can be correlated with the Cornium, Stratum Lucidum, Stratum Stratum Granulosum, Stratum Spinosum and Stratum Basale, Papillary layer of dermis and Reticular layer of Dermis on the basis of similarity of their structural, functional and applied aspect and it can be shown on Table number 3 also. So after detailed study of concept of Twacha, we can state that Twacha is well established tool in clinical examination, diagnostic and prognostic aspect in medical science.

# CONCLUSION

Twacha is one of the important presentable parts of the body and has a definite role in one's personality. Skin is regarded as the mirror of an individual's which reflects our emotions and aspect of normal physiology. Skin is the real wealth of the being. It also acts as a medium for the absorption of various medicines in the form of Abhyanga, Parisheka etc. Any disorders of Skin(Twacha) affects on somatic level as well as on psychological level so to get a proper idea of disorders of skin, one must know the normal echo-texture of Twacha and it can be achieved only by detailed study of Twacha as per Ayurveda in Rachnatmaka and Kriyatmaka aspect as well as Modern aspect. The entire article concludes that skin not only protects the internal structure of the body, but its complex structure and function creates a unique environment which protects the inner functioning of the body and is interact equilibrium with external environment also.

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Layer	Name	Twakroga Adhishtana/ Karma
1 <sup>st</sup>	Udakadhara	Exposed to sunlight, Holds the Udakdhatu (regulation of water balance)
2 <sup>nd</sup>	Asrugdhara	Rich source of blood supply and carries Rakta
3 <sup>rd</sup>	Tritiya Twacha	Siddhma and Kilasa
4 <sup>th</sup>	Chaturthi Twacha	Kushtha and Dadru(Tinea corporis/ Ringworm)
5 <sup>th</sup>	Panchami Twacha	Alaji and Vidradhi
6 <sup>th</sup>	Shashthi Twacha	Arushika (Tinia capitis/ Seborrheic dermatitis) and Tamahpravisyati (feeling of
		darkness in front of eye due to sudden loss of consciousness)

 Table 1: Layers of skin according to Charaka

# Table 2: Layers of skin according to Sushruta

Layer	Name	Parmaan(Thickness)	Function and Diseases	
	_	Ancient(in Vrihi)		
1 st	Avabhasini	1/18 <sup>th</sup> part	<ul> <li>-Responsible for exhibition of Gaura, Shyamadi</li> <li>Varna (complexion), Five types of Prabha(glory)</li> <li>and Chaya(shades)of the body.</li> <li>- Adhisthian for Sidhma(Flat nevi) and</li> <li>Padmakantaka.</li> </ul>	
2 <sup>nd</sup>	Lohita	1/16 <sup>th</sup> part	<ul> <li>Reddish in colour, holds the blood and prevents outflow of <i>Rakta Dhatu</i> from the body.</li> <li><i>Adhisthan</i> for <i>Tilakalaka</i>(non elevated mole), <i>Nyachya</i>(~congenital hyper-pigmentation on face) and <i>Vyangya</i>(melasma).</li> </ul>	
3 <sup>rd</sup>	Shweta	1/12 <sup>th</sup> part	- <i>Adhisthan</i> for <i>Charmadala</i> , <i>Mashaka</i> (Elevated mole) and <i>Ajagallika</i> (plague).	
4 <sup>th</sup>	Tamra	1/8 <sup>th</sup> part	- Adhisthan for Kilasa(Vitiligo) and Kushtha.	
5 <sup>th</sup>	Vedini	1/5 <sup>th</sup> part	<ul> <li>Concerned with the perception of touch, pain, heat, and cold.</li> <li><i>Adhisthan</i> for <i>Kushtha</i> and <i>Visarpa</i>.</li> </ul>	
6 <sup>th</sup>	Rohini	1 part	<ul> <li>Responsible for wound healing process(Vrana Ropana karma)</li> <li>Adhisthan for Granthi(cyst), Arbuda(tumors), Apachi(~scrofula), Shleepada(elephantiasis) and Galaganda(goiture).</li> </ul>	
7 <sup>th</sup>	Mamsadhara	2 part	<ul> <li>Thickest layer among all</li> <li>Adhisthan for Bhangandara(fistula in-ano),</li> <li>Vidradhi(abscess) and Arsha(piles).</li> </ul>	

Twacha Sthara	Sub division of Skin Layer	Layer of Skin
Avabhasini	Stratum Corneum	
Lohita	Stratum Lucidum	
Shweta	Shweta Stratum Granulosum	
Tamra	Malpighian Layer	-
Vedini	Papillary Layer	
Rohini	Reticular Layer	Dermis
Mamsadhara	Subcutaneous tissue and Muscular Layer	_