

A Comparative Study of Twacha Shareer with Skin (Integument)

Gyanendra Kumar Gupta^{1,*}, Gagan Devi²

Department of Kriya Sharir, SKS Ayurvedic Medical College, Mathura, Uttar Pradesh, India
Department of Rachna Sharir, SKS Ayurvedic Medical College, Mathura, Uttar Pradesh, India

Abstract

Ayurveda is science of life and its main aim is to maintain healthy status of healthy living being, i.e., prevention of disease and treatment of disease. As per Ayurvedic science, sharir is made up of dosha, dhatu, updhātu and mala. Twacha is considered as updhātu of mamsa dhatu. Twacha is one among the five gyanendriyas having its perception as mentioned with their respective diseases.

In Ayurvedic classics, various opinion regarding twacha uttapati, twacha stara and associated disorders are mentioned. This article lays emphasis on the known and the lesser known functions of twacha, its correlation with skin with special reference to anatomical and physiological aspect. This article describes twacha in all respects of kriyasharir (i.e., as an indriya and its role in sensation of touch, its doshic composition and its function) and Rachna sharir (i.e. structure, origin, types etc). Since description of twacha and its thickness is present in both the sciences, so an attempt is made in this article to correlate and compare twacha with skin (integument).

Keywords: Ayurveda, Dosha, Dhatu, Updhātu, Mala

***Author for Correspondence** E-mail: gyanender.gupta@gmail.com

INTRODUCTION

Ayurveda, which is the most ancient documented science of life, insists upon the prevention of the disease rather than adopting the curative measures [1]. To fulfill these purposes, Ayurveda has mentioned various fundamental principles in reference of Sharir Rachna, Sharir kriya, Chikitsa etc. Sharir is made up of doshas, dhatus, updhāt and malas [2].

Twacha is considered as updhātu of mamsa dhatu [3]. Twacha is one among the five gyanendriyas [4]. It is a seat of sparshanendriya.

Twacha has various views and counter views regarding twacha uttapati, twacha stara and associated skin disorders.

Skin, the largest organ of human body [5], holds significant importance in maintaining normal human physiological condition. Twacha pareeksha is also explained among eight tool of Ashtavidha pareeksha [6].

If the description of twacha in Ayurvedic texts and the description of skin in modern texts is seen, then we will come to know that most of the part matches with each other. The number, types, thickness and even the disease occur in each layer is same.

AIMS & OBJECTIVES

- To study the concept of Sharir Rachana and Sharir kriya of twacha.
- To compile different opinions of twacha together as explained in different classical texts.
- To study the skin described in modern science.
- To study the concept of twacha in detail and to compare and evaluate data available on skin.

MATERIALS AND METHODS

Since the present study is a literary research, different opinions are available in classical literature on twacha is compiled here. This was followed by collection of data regarding skin. Then after, comparative points were analysed and interpreted.

Literary Review

Acharya Charak has described skin as a structure covering the entire body. Acharya Sushruta described that after fertilization of sperm and ovum (i.e., foetus), development take place and consequently seven layers of twak come into existence like those of cream in milk [7]. Vagbhata described twacha formed due to the paka of rakta dhatu by its dhatvagni in the foetus. After paka, it dries up to form twacha, just like the deposition of cream over the surface of boiled milk [8].

In different texts of Ayurveda, there is little bit controversy regarding number of layers of twacha. The variation is as follows (Table 1):

1. Charak Samhita—6
2. Sushrutasamhita—7
3. Ashtanghridaya—7
4. Ashtangsangrah—6
5. Sharangdharsamhita—7
6. Bhavaprakash—7
7. Kashyapsamhita—6
8. Modern Science—7

In the body, seven layers of skin are produced during the cooking (metabolic heat activity) of blood just as the layer of scum, during the cooking of milk.

Out of seven layers of skin, the first layer is known as avabhasini, which illuminates all sorts of complexion and also brightens five type of shade. It measures eighteenth part of a barley grain and is seat of sidhma and padmakantaka.

The second layer is known as lohita, which measures sixteenth part of a barley grain and is the seat of tilakalaka, nyaccha and vyanga.

The third layer is known as shweta, measuring one twelfth of a barley grain and is the seat of charmadala, ajagalli and masaka.

The fourth layer is tamra, measuring one eighth of a barley grain and is the seat of various types of vitiligo and leprosy.

Fifth layer is vedini, measuring one fifth of a barley grain and is the seat of leprosy and erysipelas.

The sixth layer is rohini, measuring one barley grain and seat of cyst, scrofula, tumor, elephantiasis and goiter.

The seventh layer is mamsadhara, measuring two barley grains and seat of fistula in ano, abscess and piles [14].

There are six layers of skin in the body, outermost layer of skin is known as udakadhara. The second one is that which holds up blood. The third one is the seat of the origin of sidhma and kilasa. The fourth one is the seat of the origin of ringworm and leprosy.

The fifth one is the seat of the origin of alaji and vidradhi. The sixth layer is that which, if cut, causes loss of consciousness and is the seat of the origin of boils being manifested as blackish red and deep rooted on joints and are hardly curable [15].

Table 1: Names of Twacha in Different Texts.

S. No.	Charak Samhita [9]	Sushruta Samhita [10]	Ashtang Sangrah [11]	Sharangdhar [12]	Bhavaprakash [13]
1	Udakdhara	Avabhasini	Udakdhara	Avabhasini	Avabhasini
2	Asrukdhara	Lohita	Asrukdhara	Lohita	Lohita
3	Tirtiya	Shweta	Sidhma, Kilas	Shweta	Shweta
4	Chaturthi	Tamra	Sarv, Kushth Sambhavadhishthan	Tamra	Tamra
5	Panchami	Vedini	Alaji, Vidradhi Sambhavashishthan	Vedini	Vedini
6	Sashti	Rohini	Pranadhara	Rohini	Rohini
7	----	Mansdhara	-----	Sthoola	Sthoola

In brief description, twacha can be summarised as:

Bheda Name	Susruta	Disease	Charaka Name	Disease
Avabhasini	1/18 th of Barley grain	Siddhna padam Katak	Udakdhara	-----
Lohita	1/16 th of Barley gain	Tilkala, Nyacha vyanga	Asrugdhara	-----
Shweta	1/12 th of Barley gain	Charmadal, Ajgalli Masaka	Tirtiya	Siddhma Kilasa
Tamra	1/8 th of Barley gain	Kustha, kustha	Chaturthi	Dadru Kustha
Vedini	1/5 th of Barley gain	Kustha, visarpa	Panchami	Alaji vidardhi
Rohini	1 of Barley gain	Granthi, Apachi, Arbuda Sleepada, galganda	Shasti	Tama Pravishati
Mamsadhara	2 nd of Barley gain	Arsha, Bhagandar Vidradhi	-----	Arunstika

In Susruta Samhita we find reference of thickness of skin that is already explained. The total depth of all the seven layer of skin is equal to breadth of the middle of thumb, which measures six barley grains less one twentieth part. Other than this, we did not find any reference.

According to modern science, skin is the largest organ of the body.

Seat of panchendriya (Chakshuendriya, srotendriya ghanendriya, rasanendriya and sparshendriya) are eye, ear, nose, tongue and skin, respectively.

The pitta situated in skin is known as Bhrajak, which absorbs drugs applied externally in forms of massage bath, dipping, paste etc, and also illumines various shade of complexion [16].

Mamsa vaha srotus have their root in snayu and twacha [17].

Skin covers the entire body with six parts. Tactile perception is perceived by sparshendriya which is situated in the skin.

According to Ayurveda, function of twacha can be summarised as:

1. Seat of sparshendriya.
2. One among root of mamsavaha srotus.
3. Covers the entire body with six parts.
4. Seat of bhrajak pitta.

5. Illuminate various shade of complexion [18].

Twacha is pancha bhoutika with predominance of vayu mahabhuta.

Panchapanchaka

Indriya: Sparshendriya.

Druvya: Vayu.

Adhistana: Twacha.

Artha: Sparsha.

Budhi: Sparsha budhi [19].

SKIN/INTEGUMENT

Skin can be defined as anatomically and physiologically specialised boundary lamina which is essential for life. Skin is the largest organ of the body. It forms 8% of the total mass of the body.

Structure

Structurally it is very complex and highly vascularised tissue. Skin is made up of two layers (Figure 1):

- a) Epidermis;
- b) Dermis.

Epidermis

The epidermis is the outer layer of skin. It is formed by stratified epithelium, which consists of five layers (Table 2):

1. Stratum corneum;
2. Stratum lucidum;
3. Stratum granulosum;
4. Stratum spinosum;
5. Stratum germinativum [20].

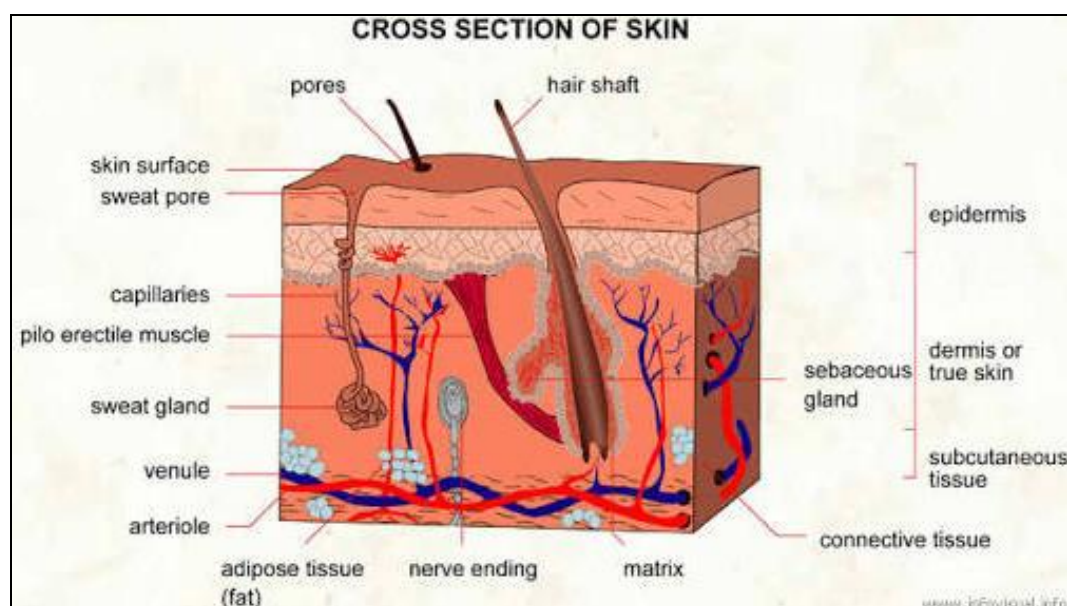


Fig. 1: Cross-Section of Skin.

Table 2: Special Features of the Different Layers of Epidermis.

S. No.	Epidermis	Cells	Special feature
1.	Stratum corneum (Horny layer)	Corneocytes Stratified epithelial cells	Fibrous protein keratin is present
2.	Stratum lucidum	Flattened epithelial cells	Eleidin (Precursor of keratin) is present.
3.	Stratum granulosum	Flattened rhomboid cells Three cells layered	Keratothyalin is present in shape of granules.
4.	Stratum spinosum (Prickle cell layer)	Several (3–5) cells thick. Cell possess spine-like projection	Some melanocyte.
5.	Stratum germinativum	Polygonal cells—Superficially. Columnar or cuboidal Epithelial cells—deep.	Keratinocytes. Melanocytes.

The important feature of epidermis is that, it does not have blood vessels. The nutrition is provided to epidermis by the capillaries of dermis.

Dermis

Dermis is the inner layer of the skin. It is a connective tissue made up of dense and stout collagen fibers, fibroblasts and histiocytes. Dermis is made up of two layers:

1. Superficial papillary layer.
2. Deeper reticular layer [21].

Functions

The primary function of skin is the protection of organs. However, it has many other important functions also.

1. Protective Function

Skin forms the covering of all the organs of the body and protects these organs from following factors:

- Bacteria and toxic substances.

- Mechanical blow.
- Ultraviolet rays.

2. Sensory Function

Skin is considered as the largest sense organ in the body. It has many nerve endings, which form the specialized cutaneous receptors. These receptors are stimulated by the sensation of touch, pain, pressure or temperature and convey these sensation to brain via afferent nerves.

3. Storage Function

Skin stores fat, water, chloride and sugar.

4. Synthetic Function

Vitamin D₃ is synthesized in the skin by the action of ultraviolet rays from sunlight on cholesterol.

5. Regulation of Body Temperature

Skin plays an important role in the regulation of body temperature. Excess heat is lost from the body through skin by radiation, conduction, convection and evaporation.

Sweat glands of the skin play an active part in heat loss by secreting sweat. The lipid content of sebum prevent loss of heat from the body in cold environment.

6. Regulation of Water and Electrolyte Balance

Skin regulates water balance and electrolyte balance by excreting water and salts through sweat.

7. Excretory Function

Skin can excrete small quantities of waste material such as urea, salts and fatty substances.

8. Absorptive Function

Skin can absorb the fat soluble substances and some ointments.

9. Secretory Function

Skin secretes sweat through sweat glands and sebum through sebaceous glands [22].

Comparison of Skin Layers

The numbers of skin layers mentioned in Sushruta Samhita and modern science are same.

1. Avabhasini can be compared with stratum corneum, as avabhasini is a reflector layer which illuminates all shades of skin and stratum corneum is the outermost layer of the skin.
2. Shweta can be compared with stratum lucidum as Shweta is a transparent white or clear layer and stratum lucidum is also transparent or clear layer.
3. Lohita can be compared with stratum granulosum as lohita is a layer having reddish coloured cells in it and stratum granulosum is a layer having granular copper coloured cells.
4. Tamra can be compared with stratum granulosum as tamra is a layer having granular copper cells in it and stratum granulosum is a layer having granular copper coloured cells.
5. Vedini can be compared with papillary layer as vedini is a layer having touch sensitive cells in it and papillary is a layer having touch sensitive dermal papillae.
6. Rohini can be compared with reticular as rohini is a layer having cells helpful for wound healing and reticular is a layer having dense irregular connective tissue and blood vessels arranged by thick collagen fibers in a net-like manner.

7. Mansdhara can be compared with hypodermis as mansdhara is a layer which gives support to underlying structures i.e., deep fascia and muscles and hypodermis is a layer below the dermis just above the muscles.

DISCUSSION

Twacha is also explained under eight tool of Ashta vidha rogi pareeksha, thus by examining the twacha we can have a fair idea of the disease. Rasavaha srotas mainly vitiated because of abnormal functioning of mana and mana has direct effect on twacha. This makes mana a leading cause of twacha vikara.

Descriptions of twacha in classical texts and modern texts have tremendous similarity between these two regarding numbers, layers, thickness etc. There is much more wide area still to be covered.

CONCLUSION

According to Acharya Sushruta, there are seven layers of twacha and in modern science also their number is same.

The layers of twacha described by Acharya Sushruta and their names match with the layers of skin anatomically and physiologically.

Acharya Sushruta even described thickness of each layer of twacha, which is not explained in modern science till today.

Indriya pancha panchak and factors causing pratyakasha gyan can be used as a tool to understand the physiology of Gyangrahanprakriya of any sense organ.

It exhibits the image of the physiological and pathological imbalances of the body's internal environment.

REFERENCES

1. Shastri RD, Upadhyaya Y, Pandey G, *et al.* (Eds.). *Charak Samhita, Part 1, Sutrasthana, Chapter 30, Verse 24.* Varanasi: Chaukhambha Bharti Academy; 2003.
2. Sharma AR (Ed.). *Susruta Sushrutsamhita, Part 1, Sutra Sthana,*

- Chapter 15. Varanasi: Chaukhambha Surbharti Prakashan; 2017.
3. Gupta GK (Ed.). *Ayurvediya Kriya Sharir Vigyan*. Meerut: Utkarsha Prakashan; 2016. 110p.
 4. Shastri RD, Upadhyaya YN, Pandey GS, (Eds.). *Charak Samhita, Part 1, Sutrasthana, Chapter 8, Verse 08*. Varanasi: Chaukhambha Bharti Academy; 2003.
 5. Gupta GK (Ed.). *Aadhunika Kriya Sharir Vigyan*. Meerut: Utkarsha Prakashan; 2018. 80p.
 6. Shastri VSLP. *Ayurvedacharya, Yogaratnakar elaborated Vidyotini, Hindi commentary*. Varanasi: Chaukhambha Bharati Academy; 2015. 5p.
 7. Sharma AR (Ed.). *Susruta Sushrutsamhita, Part 1, Sharir Sthana, Chapter 4, Verse 4*. Varanasi: Chaukhambha Surbharti Prakashan; 2017.
 8. Gupta GK (Ed.). *Ayurvediya Kriya Sharir Vigyan*. Meerut: Utkarsha Prakashan; 2016. 132p.
 9. Shastri RD, Upadhyaya Y, Pandey GS, (Eds.). *Charak Samhita, Part 1, Sharira sthana, Chapter 07, Verse 04*. Varanasi: Chaukhambha Bharti Academy; 2003.
 10. Gupta GK (Ed.). *Ayurvediya Kriya Sharir Vigyan*. Meerut: Utkarsha Prakashan; 2016. 132p.
 11. Sharma SP (Ed.). *Astang Sangrah with Indu commentary Shashilekha, Chapter 5, Reprinted edition*. Varanasi: Chowkhambha Sanskrit Series; 2006. 24–9p.
 12. Tripathi BN (Ed.). *Sharangdhar, Samhita Dipika reprinted edition Sharangadhar purvakhand ch 5*. Varanasi: Choukhamha Surbharti Prakashan; 2010. 37–59p.
 13. Mishra BS (Ed. hindi commentary). *Bhavprakash purvakhand vidyotini, Eleventh Edition, Garbha Prakaran Ch. 3*. Varanasi: Sanskrit Bhavan; 2010. 279–384p.
 14. Gupta GK (Ed.). *Ayurvediya Kriya Sharir Vigyan*. Meerut: Utkarsha Prakashan; 2016. 133p.
 15. Gupta GK (Ed.). *Ayurvediya Kriya Sharir Vigyan*. Meerut: Utkarsha Prakashan; 2016. 134p.
 16. Sharma AR (Ed.). *Susruta Sushrutsamhita, Part 1, Sutra Sthana, Chapter 21, Verse 20*. Varanasi: Chaukhambha Surbharti Prakashan; 2017.
 17. Shastri RD, Upadhyaya Y, Pandey G, (Eds.). *Charak Samhita, Part 1, Vimana sthana, Chapter 5, Verse 08*. Varanasi: Chaukhambha Bharti Academy; 2003.
 18. Gupta GK (Ed.). *Ayurvediya Kriya Sharir Vigyan*. Meerut: Utkarsha Prakashan; 2016. 135p.
 19. Gupta GK (Ed.). *Ayurvediya Kriya Sharir Vigyan*. Meerut: Utkarsha Prakashan; 2016. 136p.
 20. Chaudhuri SK (Ed.). *Medical Physiology*. Kolkata: Central Book Agency Ltd.; 2011. 475p.
 21. Waugh A, Grant A (Eds.). *Anatomy and Physiology in health and illness*. UK: Churchill Livingstone Elsevier; 2011. 354p.
 22. Gupta GK (Ed.). *Aadhunika Kriya Sharir Vigyan*. Meerut: Utkarsha Prakashan; 2018. 80–81p.

Cite this Article

Gupta GK, Devi G. A Comparative Study of Twacha Shareer with Skin (Integument). *Research and Reviews: A Journal of Ayurvedic Science, Yoga and Naturopathy*. 2018; 5(3): 7–12p.