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## ANATOMICAL AND PHILOSOPHICAL DIMENSIONS OF TWACHA: AN INTEGRATIVE REVIEW OF ANCIENT AND MODERN VIEWS

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### ABSTRACT

Ayurveda, the ancient Indian system of medicine, presents a comprehensive understanding of human anatomy and physiology. Classical scholars such as Acharya Charaka and Acharya Sushruta have elaborately described Twacha, identifying it as the Adhishtana of Sparshanendriya (organ of touch) in Sushruta Samhita. Twacha is not merely an external covering but a vital structure associated with Dhatu nourishment, systemic balance, and overall health. Modern biomedical science similarly recognizes the skin as the largest organ of the integumentary system, responsible for sensory perception and functioning as the body's primary protective barrier. Although most skin disorders are not life-threatening, they significantly affect quality of life, emphasizing the need for detailed anatomical and functional knowledge. This review integrates Ayurvedic concepts—including Nirukti, Sharirachana, Sharirkriya, Vikriti, and unique notions such as Varna, Chhaya, Prabha, and Twaksara—with contemporary dermatological understanding. Such a comparative approach strengthens clinical insight into the structural and functional dimensions of Twacha in present-day practice.

### INTRODUCTION

The skin is the largest organ of the human body and a major component of the integumentary system, covering about 1.5–2 m<sup>2</sup> and constituting nearly 15% of total body weight in adults.<sup>5</sup> It functions as a protective barrier between the internal and external environments and plays

vital roles in thermoregulation, sensory perception, immune defense, metabolism, and fluid balance. In Ayurveda, the skin is termed *Twacha*, *Twak*, or *Charma* and is regarded as the *Adhishthana* of *Sparshanendriya* (organ of touch). Acharya Charaka describes six layers of *Twacha*, while Acharya Sushruta details seven layers with specific thickness and associated disorders.<sup>2</sup> Sushruta also notes regional variation in thickness, a concept aligned with modern anatomy, which recognizes thicker skin on the palms and soles and thinner skin on the eyelids.<sup>1</sup> Given the high prevalence of dermatological conditions, comprehensive knowledge of the skin's structure and function is essential for effective prevention and management.

### **Materials and Methods**

This review study was conducted through an extensive literary survey of classical Ayurvedic texts, including *Charaka Samhita*, *Sushruta Samhita*, and related commentaries.<sup>2</sup> Contemporary anatomical textbooks and authenticated academic sources were also consulted to obtain modern scientific perspectives on skin structure and development. Anatomical understanding of the skin was supported by observations from cadaveric dissection. Microscopic examination was considered for studying the histological layers of the skin. The thickness of the skin at different anatomical sites was assessed through observational methods and measured using instruments such as calipers and ultrasonography.<sup>5,8</sup>

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

The term *Twacha* originates from the root "*Twach-Samvarane*," meaning "that which covers." Classical texts use *Twak* and *Charma* synonymously to denote the body's outer protective layer.<sup>2</sup> *Twacha* safeguards the underlying *Dhatus*—*Rakta*, *Mamsa*, and *Meda*—thereby functioning as a vital biological barrier. In Ayurveda, *Twacha* is recognized as the *Adhithana* of *Sparshanendriya* (organ of touch) and is included among the *Panch Gyanendriyas*. It possesses the natural ability to expand and contract and serves as the functional domain of *Prana* and *Vyana Vayu*. As a specialized sensory structure, *Twacha* enables the perception of touch, pain, pressure, heat, and cold.<sup>1</sup>

### **Sharira Rachana of Twacha**

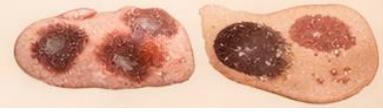
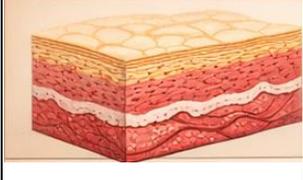
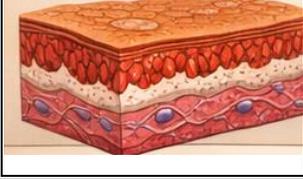
Acharya Charaka describes *Twacha* as an *Upadhatu* of *Mamsa Dhatu* and the seat of *Sparshanendriya*. As per *Panchamahabhuta Siddhanta*, all organs, including *Twacha*, are composed of five elemental principles. Therefore, both its structure and function are organized according to *Panchabhautika* composition.<sup>2</sup>

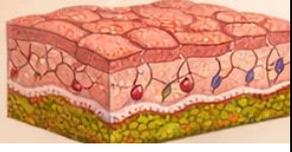
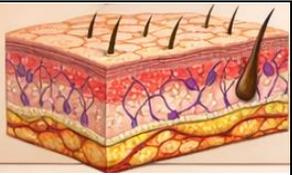
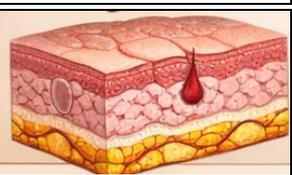
Twacha protects the body from mechanical, thermal, chemical, and environmental insults while simultaneously facilitating sensory perception.<sup>5</sup>

### Layers of Twacha According to Acharyas

Acharya	Number of Layers Described	Special Notes
Charaka	Six	Two layers specifically named; others explained through disease correlation
Sushruta	Seven	Named each layer, described thickness and associated diseases
Vagbhata	Seven	Similar classification to Sushruta
Sharangadhara	Seven	Followed seven-layer description
Gangadhara	—	Clarified differences between Charaka and Sushruta
Bhela	Six	Classification similar to Charaka

### Probable Correlation with Modern Skin Layers

Ayurvedic Layer	Probable Modern Correlation	Pictures	Associated Disorders (as per Sushruta)	Pictures
Avabhasini	Stratum corneum		Sidhma, Padmakantaka	
Lohita	Stratum lucidum		Tilakalaka, Vyanga	
Shweta	Stratum granulosum		Charmadala, Ajagallika	
Tamra	Malpighian layer		Kilasa, Kushtha	

Ayurvedic Layer	Probable Modern Correlation	Pictures	Associated Disorders (as per Sushruta)	Pictures
Vedini	Papillary dermis		Visarpa	
Rohini	Reticular dermis		Granthi, Arbuda, Galaganda	
Mamsadhar a	Subcutaneous tissue		Bhagandara, Vidradhi, Arsha	

### Synonyms of Twacha

Twacha is described by various terms in classical literature, including Charma, Sparshan, Chavi, Chadani, Asrugdhara, Romabhumi, Ajin, and Kruti. In modern terminology, it corresponds to the dermis or skin.

### Development of Twacha (Twacha Utpatti)

#### I. Ayurvedic Perspective

##### 1. Acharya Sushruta

Shukra + Shonita Union (Garbhanirmana)

↓

Metabolic transformation during embryogenesis

↓

*Ksheer-Santanika Nyaya* (cream forming over milk analogy)

↓

Formation of Twacha layers

##### 2. Acharya Charaka

Shukra-Shonita Sanyoga

↓

Sequential development of Sapta Dhatu

↓

Origin of six layers of Twacha from Mamsa Dhatu

### 3. Acharya Vagbhata

Rakta Dhatu

↓

Paka (metabolic transformation) by Dhatvagni

↓

Formation of Twacha

## II. Modern Embryological Perspective

Fertilization

↓

Gastrulation ( $\approx$  4th week)

↓

Formation of Germ Layers

- **Ectoderm** → Epidermis (also forms nervous system)
- **Mesoderm** → Dermis

↓

Stages of Epidermal Development:

- Specification
- Stratification
- Differentiation
- Appendage formation

## Clinical Considerations

In Ayurvedic literature, skin disorders are categorized under Kustha Roga, broadly divided into Maha Kustha and Kshudra Kustha. Modern dermatology describes a wide spectrum of dermatological conditions including inflammatory disorders, infections, autoimmune conditions, and neoplasms.

## Physiological Concept of Twacha

Ayurveda defines Sharira as that which constantly undergoes wear and renewal. Twacha protects underlying Rakta and Mamsa Dhatu and serves as a physical barrier against microbial invasion and environmental stressors.

Being an Upadhatu of Mamsa, its primary function includes Dharana (support and containment). Bhrajaka Pitta, located in Twacha, governs complexion and metabolic activity of externally applied substances such as oils and medicated pastes. Vitiating of Bhrajaka Pitta results in altered Chhaya and Prabha.

The Avabhasini layer is particularly responsible for Varna (complexion) and Chhaya (shade). Udakadhara maintains hydration, while Romakoopa facilitates sweat evaporation, thus contributing to thermoregulation and electrolyte balance.

### **Concept of Varna, Chhaya, and Prabha**

Acharya Charaka describes four primary physiological complexions (Prakrit Varna):

1. Krishna
2. Shyama
3. Shyama-Avadata
4. Avadata (Gaura)

Varna remains relatively constant, whereas Chhaya and Prabha may vary according to health status. Chhaya influences the tone of complexion and is observed at close range, while Prabha denotes radiance visible from a distance. Prabha is classified into seven types: Rakta, Peeta, Sita, Shyava, Harita, Pandu, and Asita.<sup>2</sup>

These descriptions indicate a sophisticated observational understanding of dermatological variations and systemic correlations.

### **RESULTS**

Comparative evaluation through literary review and anatomical observation suggests substantial conceptual similarity between classical Ayurvedic descriptions and modern anatomical understanding of skin layers. The seven-layered description by Acharya Sushruta closely aligns with modern histological stratification.<sup>4</sup>

The outermost Avabhasini corresponds to the stratum corneum, followed by Lohita, Shveta, Tamra, Vedini, Rohini, and Mamsadhara, which correlate respectively with progressively deeper anatomical layers.

Both systems recognize the skin as the primary protective barrier and the principal organ for sensory perception. Twacha is also responsible for Varna (complexion), Chhaya, and Prabha.

## DISCUSSION

Ayurveda presents a holistic and layered understanding of Twacha, attributing both structural and functional significance to each layer. Classical texts emphasize that the integrity of each layer contributes to overall physiological balance.<sup>2</sup>

Twacha is described as the seat of Sparshanendriya and is considered an Upadhatu of Mamsa Dhatu. The role of Bhrajaka Pitta in maintaining complexion and metabolic activity of the skin is also emphasized.

The Ayurvedic classification of pigmentation (Varna) and Prabha demonstrates an advanced observational understanding of dermatological variations. Many pathological conditions are described according to the involvement of specific layers, reflecting a layered pathophysiological concept.

Modern dermatology similarly acknowledges the layered structure of skin and its immunological, sensory, and protective roles. The integrative interpretation enhances conceptual clarity and broadens diagnostic perspective.

## CONCLUSION

The integrative study of Twacha Sharir from both Ayurvedic and modern viewpoints establishes a comprehensive conceptual understanding of the skin. The classical descriptions of Twacha layers demonstrate remarkable anatomical insight that correlates significantly with contemporary histological findings.

Clinical examination of the skin remains fundamental in diagnosis, as many systemic and localized disorders manifest through observable changes in color, texture, and sensation. Understanding the normal physiology (Prakriti) of Twacha is essential to recognize pathological deviations (Vikriti).

Therefore, an in-depth study of Twacha in its Rachanatmaka and Kriyatmaka aspects, integrated with modern anatomical knowledge, is indispensable for accurate diagnosis and holistic clinical practice.

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