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Conceptual Study of Twacha Sharir and Its Correlation with Modern Skin Histology Gelda N.¹, Patil C.²

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ABSTRACT:

Twacha (skin) is one of the most significant organs described in Ayurvedic classics, functioning as a protective covering and playing a vital role in sensation, thermoregulation, and maintenance of homeostasis. According to Acharya Sushruta, Twacha is derived from Mamsa Dhatu and is composed of seven distinct layers, each possessing specific thickness, functions, and pathological relevance. Modern anatomy describes the skin as comprising three principal layers—epidermis, dermis, and hypodermis. Although the numerical classification differs, both systems demonstrate close similarity in structural and functional attributes. The present conceptual literary study aims to analyze Twacha Sharir as described in Ayurveda and to correlate it with modern skin histology. Such correlation aids in better understanding of dermatological disorders and supports the scientific validity of Ayurvedic anatomical concepts.

KEYWORDS:

Twacha Sharir, Skin Histology, Ayurveda Anatomy, Correlation Study, Sushruta Samhita

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INTRODUCTION:

Twacha, commonly known as the skin, serves as the outermost protective covering of the human body and is recognized as one of its largest and most vital organs. It plays multifaceted roles in safeguarding the internal structures through protection against physical trauma, facilitating sensory perception via specialized receptors, and maintaining homeostasis by regulating body temperature through mechanisms such as sweating and vasoconstriction. Furthermore, Twacha functions as an impermeable barrier that defends against mechanical injuries, pathogenic microbial invasions, harmful ultraviolet radiation, and various environmental stressors like pollutants and allergens, thereby ensuring the body's overall integrity and resilience. In the ancient Indian system of medicine, Ayurveda, Twacha is conceptualized not merely as a superficial layer but as an Upadhatu (secondary tissue) derived from Mamsa Dhatu (muscle tissue), emphasizing its interconnectedness with the body's deeper physiological processes. It is often regarded as a reflective mirror of internal health, where imbalances in Doshas (Vata, Pitta, and Kapha), Dhatus (tissues), or Malas (waste products) manifest externally through changes in skin texture, color, or conditions. Classical Ayurvedic texts, particularly those by Acharya Sushruta—the revered "father of surgery"—offer an intricate and comprehensive description of Twacha's embryological formation during fetal development, its multi-layered anatomical structure (typically delineated into seven layers known as Twak Sapta Dala), variations in thickness across different body regions, and the spectrum of disease manifestations ranging from minor irritations to severe dermatological disorders. These descriptions highlight Twacha's dynamic role in sensory functions, immunity, and even psychological well-being, aligning with holistic Ayurvedic

principles that view the body as an integrated whole. In contrast, modern biomedical science elucidates the structure and function of the skin through detailed histological analysis, dividing it primarily into three main layers: the epidermis (outermost stratified squamous epithelium), the dermis (connective tissue layer providing strength and elasticity), and the hypodermis (subcutaneous fat layer for insulation and cushioning). This perspective is grounded in microscopic studies, revealing cellular components such as keratinocytes, melanocytes, fibroblasts, and immune cells, along with appendages like hair follicles, sweat glands, and sebaceous glands that contribute to its protective and regulatory functions. While Ayurvedic texts enumerate seven distinct layers, modern histology identifies fewer primary divisions but acknowledges sublayers and functional zones that parallel ancient classifications in purpose, such as barrier formation, nourishment, and pigmentation. Despite apparent discrepancies in the enumeration of layers—stemming from differences in observational methods, terminologies, and philosophical frameworks—profound conceptual similarities persist between the Ayurvedic depiction of Twacha Sharir and contemporary skin histology. For instance, both systems emphasize the skin's stratified organization for progressive protection, its role in thermoregulation and sensation, and the correlation between internal metabolic processes and external manifestations. These parallels suggest that ancient Ayurvedic insights, derived from empirical observations and dissections, may align with modern findings when interpreted through a comparative lens, potentially bridging traditional wisdom with evidence-based science. Therefore, the present study endeavors to systematically establish a correlation between the classical Ayurvedic

understanding of Twacha Sharir and the histological features of modern skin anatomy, aiming to foster interdisciplinary insights that could enhance dermatological practices, integrative medicine, and holistic health approaches.

Aim :

To study Twacha Sharir described in Ayurveda and correlate it with modern skin histology.

Objectives :

- To study Twacha according to classical Ayurvedic texts.
- To review the modern anatomical and histological structure of skin.
- To establish correlation between Ayurvedic and modern skin layers.
- To understand the clinical importance of Twacha layers.

Materials And Methods :

This study is a conceptual literary review based on classical Ayurvedic texts and standard modern anatomy and histology textbooks.

Ayurvedic texts consulted: Sushruta Samhita, Charaka Samhita, Ashtanga Hridaya, Ashtanga Sangraha

Modern texts consulted: Standard textbooks of anatomy, physiology, histology, and dermatology.

Ayurvedic Perspective on Twacha Formation and Function

In Ayurveda, the ancient holistic medical system of India, Twacha—commonly referred to as the skin—is conceptualized as emerging during the intrauterine phase of life. It originates as an Upadhatu, or secondary tissue, derived from the Mamsa Dhatu (muscle tissue), underscoring its deep interconnection with the body's structural and nutritional frameworks. This formation process is intricately linked to the maturation of the seven Dhatus (fundamental tissues) in the fetus, where Twacha develops as a protective envelope influenced by maternal

nutrition, Dosha balance (Vata, Pitta, and Kapha), and environmental factors within the womb. Functionally, Twacha serves dual primary roles: as a robust protective barrier shielding the internal organs from external threats such as pathogens, physical trauma, and climatic extremes, and as a sophisticated sensory organ equipped with receptors for touch, pain, temperature, and pressure, facilitating interaction with the environment and contributing to overall sensory awareness. Acharya Sushruta, one of the foundational figures in Ayurvedic surgery and anatomy, provides a meticulous classification of Twacha into seven distinct layers in his seminal text, the Sushruta Samhita. This layered model, often termed "Twak Sapta Dala" (seven petals of the skin), reflects an empirical understanding derived from dissections, observations of diseases, and surgical practices. Each layer is not merely anatomical but imbued with specific physiological functions, pathological susceptibilities, and therapeutic implications, emphasizing the skin's role as a diagnostic window into systemic health. Disruptions in these layers can manifest as various skin disorders (Twak Rogas), which are treated through herbal remedies, dietary adjustments, and Panchakarma therapies to restore Dosha equilibrium.

Detailed Description of the Seven Layers of Twacha:

The seven layers of Twacha, progressing from the superficial to the deepest, are as follows:

1. Avabhasini: As the outermost layer, Avabhasini is primarily responsible for the skin's external appearance, including its natural complexion, luster, and radiance. It acts as the first line of defense against environmental aggressors and reflects the overall vitality influenced by Pitta Dosha. Pathologically, imbalances here lead to conditions like Sidhma (a type of

- leucoderma or scaly skin disorder) and Padmakantaka (thorn-like eruptions), often treated with oil-based therapies to enhance glow and barrier function.
2. **Lohita:** This layer imparts a subtle reddish hue to the skin, closely associated with the circulation of Rakta Dhatu (blood tissue) and the subtle channels (Srotas) that nourish the tissues. It plays a role in vascular integrity and subtle metabolic exchanges. Diseases affecting Lohita include Tilakalaka (mole-like pigmented lesions), which may arise from Pitta aggravation and require cooling herbs or blood-purifying treatments.
 3. **Shweta:** Responsible for maintaining the skin's normal coloration and pigmentation balance, Shweta ensures uniformity in tone and protects against discoloration. It is linked to Kapha Dosha for moisture and stability, and disruptions can result in hypopigmentation or hyperpigmentation issues, highlighting its importance in melanin distribution and overall aesthetic health.
 4. **Tamra:** This layer is involved in deeper metabolic activities, including the transformation of nutrients and subtle energy flows. Named for its copper-like sheen, it supports enzymatic processes and is influenced by Pitta, making it susceptible to inflammatory conditions that require detoxifying interventions.
 5. **Vedini:** As the sensory powerhouse, Vedini houses nerve endings and is crucial for perceiving pain, touch, and other tactile sensations. Governed by Vata Dosha, it facilitates the transmission of sensory signals to the brain, and its dysfunction can lead to neuropathic skin disorders, emphasizing the need for nerve-calming oils and massages in treatment.
 6. **Rohini:** This regenerative layer is pivotal in healing processes, such as wound repair and tissue proliferation. It draws from Kapha for growth and stability, playing a key role in granulation tissue formation during recovery from injuries or ulcers, and is targeted in therapies promoting cicatrization.
 7. **Mamsadhara:** The deepest layer, Mamsadhara provides structural support and anchorage to the underlying muscles (Mamsa Dhatu). It ensures stability and resilience, influenced by Kapha and Vata, and its involvement in deep-seated abscesses or muscular disorders underscores the importance of strengthening regimens.

Modern Skin Histology

In contemporary biomedical science, the skin is anatomically divided into three principal layers, each with distinct histological features revealed through microscopic examination. This model emphasizes cellular composition, extracellular matrix, and appendageal structures, providing a foundation for dermatological diagnostics and treatments.

- **Epidermis:** The outermost avascular layer, the epidermis consists of stratified squamous epithelium derived from ectoderm. It is subdivided into five strata: the stratum basale (basal layer for cell proliferation), stratum spinosum (prickle cell layer for cohesion), stratum granulosum (granular layer for keratinization), stratum lucidum (clear layer in thick skin), and stratum corneum (horny layer as the ultimate barrier). This layer renews itself every 28-30 days, protecting against water loss and microbial entry.
- **Dermis:** Situated beneath the epidermis, the dermis is a vascular connective tissue layer rich in collagen, elastin, fibroblasts, blood vessels, lymphatics, nerves, sensory receptors,

sweat and sebaceous glands, and hair follicles. It is divided into papillary (superficial, loose connective tissue) and reticular (deeper, dense connective tissue) regions, providing mechanical strength, elasticity, nutrition, and sensory functions.

- Hypodermis (Subcutis): The innermost layer, composed primarily of adipose tissue interspersed with connective fibers, blood vessels, and nerves. It offers cushioning against mechanical shocks, thermal insulation, energy storage, and anchors the skin to underlying structures like muscles and bones.

Correlation Between Ayurvedic Twacha and Modern Skin Histology

Despite originating from different epochs and methodologies—Ayurveda's observational and holistic approach versus modern science's microscopic and reductionist lens—striking parallels exist in the functional and structural descriptions of the skin. The seven Ayurvedic layers can be correlated with modern histological components, bridging ancient wisdom with contemporary anatomy to inform integrative dermatology.

Ayurvedic Layer	Modern Correlation	Key Similarities and Functions
Avabhasini	Stratum corneum	Outermost barrier for protection and luster; keratinized dead cells prevent water loss and reflect complexion.
Lohita	Stratum lucidum	Translucent layer in thick skin; associated with hydration and subtle coloration, akin to vascular influences.
Shweta	Stratum granulosum	Granular cells involved in pigmentation and barrier formation; maintains color balance through keratohyalin.
Tamra	Stratum spinosum	Prickle cells for metabolic activity and cohesion; supports deeper cellular processes and resistance.
Vedini	Dermis (sensory layer)	Rich in nerve endings (Meissner's and Pacinian corpuscles); responsible for pain and tactile perception.
Rohini	Papillary dermis	Superficial dermal region for regeneration; involved in wound healing via fibroblasts and vascular supply.
Mamsadhara	Hypodermis	Adipose and connective tissue for support; provides cushioning and stability to muscles and deeper structures.

This correlation highlights how Ayurvedic layers, though more numerous, align with modern sublayers in purpose: progressive protection from external to internal, sensory integration, and regenerative support. Such insights could enhance treatments by combining herbal therapies with modern interventions, fostering a comprehensive approach to skin health.

DISCUSSION:

The comparative analysis between the Ayurvedic conceptualization of Twacha and the modern histological description of the

skin unveils a profound conceptual correlation, bridging ancient empirical wisdom with contemporary scientific precision. While the classical Ayurvedic

framework delineates seven distinct layers, each imbued with specific physiological, pathological, and therapeutic significance, modern anatomy simplifies the structure into three primary layers—epidermis, dermis, and hypodermis—supported by microscopic evidence of cellular and subcellular components. This disparity in layer enumeration arises not from contradiction but from differing methodologies: Ayurveda's holistic, observational approach, rooted in dissections and clinical correlations by sages like Acharya Sushruta, contrasts with modern science's reductionist lens, which relies on advanced techniques such as electron microscopy and immunohistochemistry to reveal intricate details like keratinocyte differentiation and extracellular matrix composition. Despite these variances, striking functional similarities emerge, underscoring the skin's universal roles in protection, sensation, regeneration, and systemic reflection.

In Ayurveda, Twacha is portrayed with deep physiological and pathological relevance, viewing it as a dynamic entity influenced by Tridosha (Vata, Pitta, Kapha) imbalances that manifest in disorders like Kushta (skin diseases), where treatments target root causes through herbs, detoxification, and lifestyle modifications. Modern science, conversely, accentuates the histological architecture, detailing how the epidermis forms a self-renewing barrier via keratinization, the dermis provides tensile strength through collagen and elastin fibers, and the hypodermis ensures metabolic support via adipocytes. Specific correlations illuminate this synergy: the Vedini layer in Ayurveda, dedicated to sensory perception and governed by Vata Dosha for transmitting tactile and nociceptive signals, aligns closely with the sensory-rich dermis in modern histology, where free nerve endings, Meissner's corpuscles, and Pacinian

corpuscles facilitate pain perception, touch discrimination, and vibration detection—essential for reflexive responses and environmental adaptation. Similarly, the Mamsadhara layer, the deepest Ayurvedic stratum offering anchorage and stability to underlying muscles (Mamsa Dhatu), corresponds to the hypodermis, which comprises loose connective tissue and fat lobules that provide mechanical cushioning, thermal insulation, and structural support, preventing shear forces and aiding in energy reserve during physiological stress. This intricate correlation not only validates the scientific depth embedded in Ayurvedic anatomical knowledge—predating modern discoveries by millennia—but also paves the way for integrative dermatology. By harmonizing these perspectives, contemporary practices could leverage Ayurvedic insights into Dosha-specific pathologies with modern interventions like topical corticosteroids or laser therapies, potentially yielding more holistic, personalized treatments for conditions ranging from eczema to chronic wounds. Ultimately, such interdisciplinary synthesis reinforces the timeless relevance of Ayurveda, demonstrating how ancient texts like the Sushruta Samhita anticipated functional zonation that aligns with today's evidence-based models, fostering a unified understanding of skin health as a gateway to overall well-being.

CONCLUSION:

Twacha Sharir described in Ayurveda shows remarkable similarity with modern skin histology. The structural and functional correlation demonstrates the scientific validity of Ayurvedic anatomical concepts. Integration of Ayurvedic and modern perspectives can enhance understanding of skin anatomy and improve disease management.

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