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ANATOMICAL AND CLINICAL PERSPECTIVES OF KSHIPRA MARMA: A REVIEW OF CLASSICAL AYURVEDIC LITERATURE

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ABSTRACT

Kshipra Marma is one of the vital *Shakhagata Marma* described by Acharya Sushruta among the 107 Marma of the human body. It is anatomically located in the interspace between the thumb and index finger in the upper limb and between the great toe and second toe in the lower limb. Structurally, it is classified as a *Snayu Marma* and prognostically as a *Kalantara Pranahara Marma*, exhibiting features suggestive of severe neurovascular involvement. Classical Ayurvedic texts describe grave consequences following trauma to Kshipra Marma, including convulsive movements, neuromuscular disturbances, excessive hemorrhage, and delayed fatal outcomes. Despite these clear descriptions, its precise anatomical correlation in modern literature remains controversial. Various structures have been proposed; however, they fail to adequately explain the classical clinical manifestations. This review critically analyzes Kshipra Marma by correlating classical Ayurvedic descriptions with contemporary anatomical knowledge. Based on its location, structural predominance, and proximity to neurovascular elements, the *Extensor Hallucis Longus* tendon along with the dorsal digital nerves is proposed as a plausible anatomical correlate providing a rational explanation for the observed clinical effects.

KEYWORDS: Kshipra Marma; Extensor Hallucis Longus; Snayu Marma; Dorsal Digital Nerves; Anatomical Correlation.

INTRODUCTION

In Ayurveda, Marma are described as vital anatomical sites that serve as seats of Prana,[5] the life-sustaining force responsible for maintaining structural and functional integrity of the body. Trauma to these sites is known to produce severe pain, functional loss, deformity, or even death, emphasizing their critical clinical importance. The concept of Marma has been comprehensively elaborated in the Brihatrayee, particularly in the Sharira Sthana of Sushruta Samhita,[4] where Acharya Sushruta presented a systematic and clinically oriented understanding of these vulnerable points. Mastery of Marma Vigyan formed the foundation of surgical precision and therapeutic safety in ancient Ayurvedic practice.

Kshipra Marma is an important Marma located in the extremities and is described bilaterally in both upper and lower limbs. The term *Kshipra* denotes rapid or swift action, reflecting the grave and quickly progressive consequences associated with its injury. Anatomically, it is situated in the interspace between the thumb and index finger[5] in the hand and between the great toe and second toe in the foot, corresponding to the first intermetacarpal and intermetatarsal regions. Classical texts describe Kshipra Marma as a Snayu-dominant structure with a prognostic outcome marked by delayed yet fatal manifestations.

Injury to Kshipra Marma is stated to result in *Akshepaka*, interpreted by classical commentators as severe convulsive activity caused by aggravated Vata affecting neurovascular pathways. This description strongly suggests neurological involvement and explains the seriousness attributed to trauma at this site. Owing to its superficial location, Kshipra Marma is particularly susceptible to injury during routine activities, trauma, and surgical interventions.

Despite detailed classical descriptions the precise anatomical correlation of Kshipra Marma remains a subject of debate in modern literature. Therefore, the present review aims to critically analyze classical Ayurvedic references and explore a plausible anatomical correlation of Kshipra Marma with special reference to contemporary anatomical structures and their neurovascular relationships.

OBJECTIVES

1. To conduct a comprehensive review of classical Ayurvedic texts in order to systematically collect and analyze references related to *Kshipra Marma*.
2. To accurately identify and document the anatomical location of *Kshipra Marma* through critical correlation of classical descriptions.

MATERIALS AND METHODS

The present study is a descriptive and analytical review based on classical Ayurvedic literature and modern anatomical texts. Primary data were collected from *Sushruta Samhita* and its authoritative commentaries to understand the classical description, characteristics, and location of Kshipra Marma. In addition, relevant contemporary research articles were reviewed to assess existing interpretations and anatomical correlations.

Subsequently, standard anatomical literature was examined to identify potential modern correlates corresponding to the classical location of Kshipra Marma, with particular emphasis on structures situated in the region between the great toe and the second toe. Anatomical components such as the Extensor Hallucis Longus tendon, dorsal digital nerves, and associated vascular structures were analyzed with respect to their position, functional significance, and vulnerability to injury.[9] The criteria for evaluating these structures as possible correlates of Kshipra Marma included their anatomical proximity to the classical site, involvement of neurovascular elements, and their ability to explain the clinical manifestations traditionally described following injury to Kshipra Marma.[10]

Concept of Marma

The term *Marma* is derived from the Sanskrit root “Mru,” which denotes destruction or death, signifying the vital nature of these anatomical sites. Classical Ayurvedic texts describe Marma as regions where vital elements such as Soma, Maruta, Teja, Satva, Rajas, Tamas, and Buddhi are present. Injury to these sites is believed to result in severe consequences, including deformity or death, thereby emphasizing the necessity for thorough knowledge of Marma, especially for surgeons.[4]

Classification of Marma

Marmas are systematically classified in Ayurvedic literature on the basis of their structural composition, regional distribution (*Shadang Sharira*), and prognostic outcome (*Parinama*).

Classification Basis	Sub-type	Number of Marma	Significance / Notes
1. Based on Rachana (Structural Predominance)	Mamsa Marma	11	Involves primarily muscle tissue; injuries affect muscular integrity.
	Sira Marma	41	Involves vessels; trauma may lead to bleeding or circulatory compromise.
	Snayu Marma	27	Involves tendons/ligaments; injuries affect movement and joint stability.
	Asthi Marma	8	Involves bones; injuries can cause fractures or skeletal deformities.
	Sandhi Marma	20	Involves joints; injuries impact mobility and functional articulation.
2. Based on Shadang Sharira (Regional Distribution)	Shakhagata Marma (Extremities)	44	Important in limb injuries; includes upper and lower extremity Marmas.
	Uras Marma (Thorax)	9	Located in thoracic region; critical for cardiac and respiratory structures.
	Udara Marma (Abdomen)	3	Located in abdomen; injuries may affect viscera and vital organs.
	Urdhvajatrugata Marma (Supraclavicular/Head Region)	37	Includes head, neck, and supraclavicular region; high risk of neurological involvement.
3. Based on Parinama (Prognostic Effect)	Sadyapranahara Marma	19	Injury leads to immediate life-threatening consequences.
	Kalantara Pranahara Marma	33	Injury may result in delayed but serious systemic effects.
	Vaikalyakara Marma	44	Causes functional impairment or disability without immediate mortality.
	Vishalyaghna Marma	3	Prevents bleeding; injury may cause hemorrhage if disrupted.
	Rujakara Marma	8	Causes intense localized pain; usually non-fatal.

Kshipra Marma

The anatomical location of *Kshipra Marma* has been clearly described by Acharya Sushruta in *Sushruta Samhita Sharira Sthana*[5] as follows:

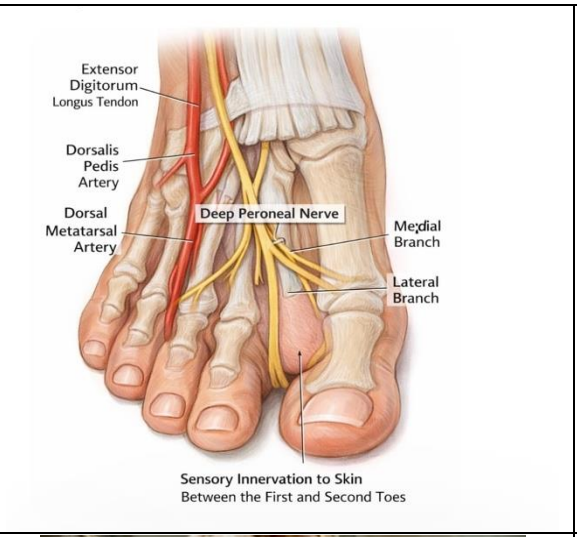
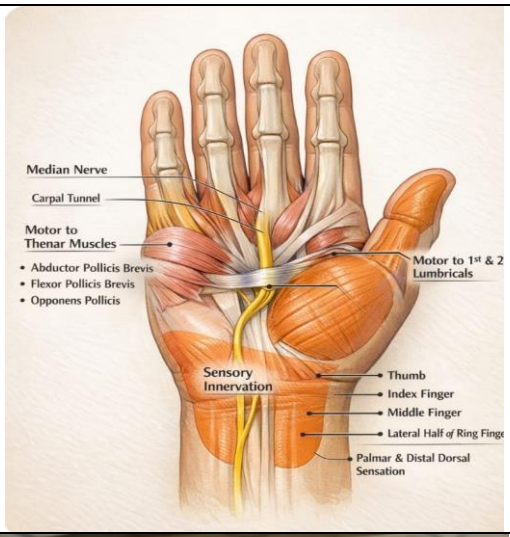
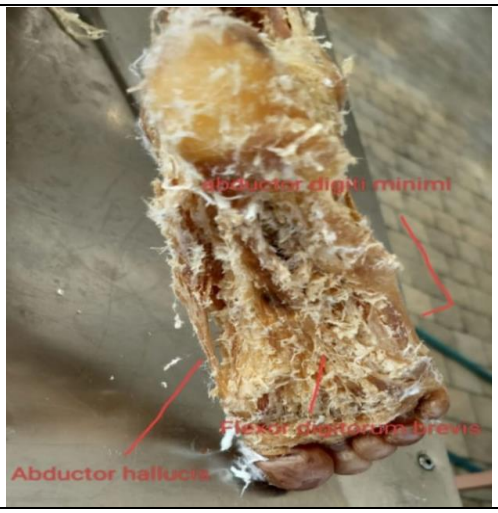
"Angushtha-anguli-antare kshipram marma"

(*Sushruta Samhita, Sharira Sthana 6/24*)

Kshipra Marma is situated in the interspace between the thumb and index finger in the upper limb and between the great toe and second toe in the lower limb. It is classified as a *Shakhagata Snayu Marma* and holds immense clinical importance due to its vital nature and grave prognostic implications when injured.

Classification of Kshipra Marma

Parameter	Adhoshakhagata Kshipra Marma	Urdhvashakhagata Kshipra Marma
Number (Sankhya)	2	2
Rachana	Snayu	Snayu
Parinama	Kalantara Pranahara	Kalantara Pranahara
Pramana	½ Angula	½ Angula
Site	Between the great toe and second toe (first intermetatarsal space)	Between the thumb and index finger (first intermetacarpal space)
Anatomical Structures Involved	Adductor hallucis brevis, lumbrical muscles, deep peroneal nerve, dorsal metatarsal artery, plantar arch, medial plantar artery	Flexor pollicis brevis, adductor pollicis, digital branches of median nerve, palmar arterial arch
Effects of Injury	Impairment of adduction and flexion of great toe, severe bleeding, hematoma beneath plantar aponeurosis, septic toxemia	Rapid loss of thumb adduction and flexion, profuse bleeding due to palmar arch injury
Figures		

Anatomical View		
Cadaveric View		

Kshipra Marma is classified as a *Kalantara Pranahara Marma* due to the predominance of Agni and Jala Mahabhuta. The rapid action of Agni combined with the slower influence of Jala results in progressive deterioration, potentially leading to death within a month following injury. Clinically, injury to this Marma manifests as *Akshepaka* (convulsions), which may culminate in fatal outcomes if not managed promptly.

Clinical Significance of Kshipra Marma

Acharya Sushruta regarded Siravedha as an important emergency therapeutic procedure within Shalya Tantra, particularly under the domain of Raktamokshana. Since Rakta plays a central role in the manifestation of numerous disorders, controlled bloodletting through Siravedha is considered an effective Shodhana measure. Classical texts recommend Siravedha at a site approximately two Angula above the Kshipra Marma, emphasizing the clinical relevance of this Marma in therapeutic interventions.[1]

Siravedha performed near Kshipra Marma is indicated in conditions such as Vatashonita, Padadaha, Vatakantaka, Padaharsha, Chippa, Visarpa, and Vicharchika, highlighting its role in disorders involving pain, inflammation, and neurovascular disturbance of the extremities. The proximity of Kshipra Marma to major neurovascular structures explains its rapid therapeutic response when appropriately stimulated.[5]

In contemporary practice, Marma Chikitsa employs controlled pressure or needling of Kshipra Marma, located between the first and second metacarpal bones in the hand. However, excessive or improper manipulation may result in Marma injury. Therefore, therapeutic application involving Kshipra Marma demands precision, anatomical awareness, and clinical caution.[6]

REVIEW OF LITERATURE

Kshipra Marma - According to *Sushruta Samhita*, Kshipra Marma is classified as a *Snayu Marma* and is anatomically located between the thumb and index finger in the upper limb and between the great toe and second toe in the lower limb. Its dimension is described as ½ *Angula*. Classical Ayurvedic texts emphasize the grave consequences of injury to this Marma, describing manifestations such as *Akshepaka* (convulsions), involuntary twitching, jerking movements, and progressive blood loss, which may ultimately culminate in death. These descriptions highlight the vital and clinically significant nature of Kshipra Marma.[2]

Kalantara Pranahara Marma - Kalantara Pranahara Marma are characterized by a delayed fatal outcome following injury, in contrast to the immediate lethality observed in *Sadyopranahara Marma*. These Marmas are predominantly associated with *Agni* and *Soma Mahabhuta*. The *Agneya Guna* of Rakta Dhatu and the *Sheeta Guna* of Rasa Dhatu reflect the predominance of Pitta and Kapha Dosha, respectively. Although the Agni element acts rapidly, the sustaining influence of Soma results in a gradual deterioration of physiological balance. Injury to Kalantara Pranahara Marma leads to slow and continuous bleeding, progressive *Dhatu Kshaya*, severe pain (*Vedana*), and eventual death (*Marana*).[8]

Long Plantar Ligament - The long plantar ligament, the longest ligament of the tarsus, originates from the plantar surface of the calcaneus and extends to the plantar surface of the cuboid, with superficial fibers continuing to the bases of the second to fourth metatarsal bones. Together with the groove on the cuboid, it forms a tunnel for the tendon of the

peroneus longus muscle. Functionally, it plays a key role in maintaining the lateral longitudinal arch of the foot by preventing excessive depression.[9]

Deep Transverse Metatarsal Ligament - The deep transverse metatarsal ligament consists of four short, flat fibrous bands connecting the plantar ligaments of adjacent metatarsophalangeal joints. These ligaments are situated dorsal to the interossei muscles and ventral to the lumbricals, closely associated with digital nerves and vessels, and contribute significantly to the stability of the forefoot.[10]

Extensor Hallucis Longus - The Extensor Hallucis Longus (EHL) muscle originates from the posterior surface of the middle two-fourths of the medial fibula and the adjacent interosseous membrane. It inserts onto the dorsal surface of the base of the distal phalanx of the great toe and is innervated by the deep peroneal nerve. Functionally, it is responsible for extension of the great toe and dorsiflexion of the foot.

RESULTS

Various anatomical structures, including the long plantar ligament, branches of the deep peroneal nerve, dorsalis pedis artery, and other components of the foot, have been proposed in earlier studies as possible correlates of Kshipra Marma. However, these interpretations often lack clarity due to the involvement of structurally diverse tissues, whereas classical Ayurvedic literature specifically identifies Kshipra Marma as a *Snayu Marma*.[2]

The Extensor Hallucis Longus tendon runs dorsally along the foot toward the great toe and lies in close proximity to the dorsal digital nerves. Although the tendon does not completely envelop these nerves, its parallel and adjacent course makes it susceptible to causing nerve irritation or damage when injured. This anatomical relationship provides a plausible explanation for the classical descriptions of convulsions, twitching, and involuntary jerking movements following injury to Kshipra Marma.[7]

DISCUSSION

Marma are vital anatomical points formed by the confluence of *Mansa*, *Sira*, *Snayu*, *Asthi*, and *Sandhi*. Based on prognosis and severity of injury, they are classified into- *Kalantara Pranahara*, *Vishalyaghna*, *Vaikalyakara*, and *Rujakara* Marmas. Acharya Sushruta described Kshipra Marma as being located between the thumb and index finger (*Angushtha* and *Anguli Madhya*), classifying it as a *Snayu Marma*.[5]

The first web space of the hand and foot holds particular functional importance, especially in the upper limb, where the thumb plays a dominant role in grasp and precision movements. The intrinsic muscles of the hand are numerous and delicate, and Sushruta may have categorized these fine muscular and tendinous structures collectively under *Snayu*, thereby classifying Kshipra as a Snayu Marma.[6]

Kshipra Marma is described as *Kalantara Pranahara* in nature, although classical texts also indicate that it may sometimes behave like a *Sadyopranahara Marma*. Trauma (*Abhighata*) to this Marma leads to *Akshepaka* and *Marana*. *Akshepaka* is a well-described *Vata Vyadhi* in both *Sushruta Samhita* and *Ashtanga Hridaya*. Severe hemorrhage following injury results in *Vata Prakopa*, and when aggravated Vata enters the *Dhamani*, violent convulsions and muscular spasms ensue.[9]

Acharya Dalhana interpreted the term *Dhamani* as *Nadi*, suggesting involvement of the nervous system. The convulsions and spasms produced by massive blood loss closely resemble the clinical features of tetanus, including *Opisthotonos*. From a modern perspective, tetanus is caused by *Clostridium tetani*, with an incubation period of 4–14 days, which closely correlates with the classical description of death occurring 15–30 days after injury to a *Kalantara Pranahara Marma*.

Severe injury to the palmar arch or dorsal metacarpal artery may result in excessive hemorrhage, ischemia, or cyanosis, potentially leading to sudden death or fatal outcomes within a short duration.

The anatomical correlation of Kshipra Marma has long been debated. Structures such as the Deep Transverse Metatarsal Ligament and Long Plantar Ligament have been proposed; however, both fail to fully satisfy classical descriptions. The DTML primarily stabilizes the transverse arch and lacks direct involvement with major nerves or vessels capable of producing convulsions or severe bleeding. Similarly, the LPL is located deep within the plantar aspect of the foot and does not correspond to the classical location between the great toe and second toe, nor does it explain the neurological manifestations described.[10]

In contrast, the Extensor Hallucis Longus tendon lies dorsally in close proximity to the dorsal digital nerves and associated vascular structures. Injury to this tendon and its neighboring neurovascular elements can plausibly result in convulsions, twitching, and rapid

deterioration, thereby aligning more closely with the classical Ayurvedic description of Kshipra Marma. Hence, the EHL tendon emerges as a more appropriate anatomical correlate of Kshipra Marma.

CONCLUSION

Based on the foregoing discussion, it can be inferred that the upper and lower limbs play a fundamental role in making human beings efficient and functional organisms. During the Samhita Kala, human life was not mechanized, and all routine activities such as cutting grass, carrying firewood, drawing water from wells, and performing agricultural and household tasks were entirely dependent on the use of hands and feet. In such activities, the thumb held particular importance, serving as a key functional unit for grip, precision, and strength. Hence, preservation and protection of the hands—especially the thumb—were of paramount importance.

In this context, a thorough understanding of Kshipra Marma and its clinical significance becomes essential during patient management. From the present study, the following conclusions regarding the precise location and structural attributes of Kshipra Marma can be drawn:

1. According to Sushruta Samhita, Kshipra Marma is located in the space between the Angushtha (thumb) and Anguli (index finger).
2. Anatomically, Kshipra Marma may be correlated with the interdigital space between the root of the thumb and the index finger.
3. Structurally, Kshipra Marma is classified as a Snayu Marma with a dimension of half an Angula.
4. Injury (Abhighata) to Kshipra Marma results in Akshepaka, ultimately leading to Marana (death), indicating its Kalantarapranahara nature.

On anatomical correlation, the Extensor Hallucis Longus tendon emerges as a probable structure corresponding to Kshipra Marma due to its close proximity to the dorsal digital nerves. Injury to this tendon may result in nerve irritation, producing clinical manifestations such as convulsive disorders, twitching, and jerking movements—features that closely resemble the classical Ayurvedic description of Kshipra Marma injury. These observations support the need for further detailed anatomical and clinical investigations to establish the Extensor Hallucis Longus tendon as the primary anatomical correlate of Kshipra Marma.

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