



ISSN 2456-3110

Vol 9 · Issue 12

December 2024

Journal of
**Ayurveda and Integrated
Medical Sciences**

www.jaims.in

JAIMS

An International Journal for Researches in Ayurveda and Allied Sciences



Maharshi Charaka
Ayurveda

Indexed

Conceptual study of *Kshipra Marma* w.s.r. to its traumatic result

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ABSTRACT

Marma is one of the important subjects of Ayurveda. It plays an important role in surgery. *Marma* points have been accepted as the "Prana- seats of life" and "vital points of the body". *Marma* is defined as sites where *Prana* resides naturally. Every individual must know these vital points of our body so that they prevent them from any type of trauma. The main focus of this study will be on the *Kshipra Marma* which is a *Snayu Marma* based on anatomical structures found in that area. *Kshipra Marma* is one of *Kalantara Pranahara Marma* based on traumatic effects. According to *Maharshi Sushrut* sometimes it is resembled like *Sadyapranhara Marma*. It is situated between the big toe and first toe in the lower limb and between the thumb and index finger in the upper limb. *Kshipra Marma* is located both in the upper and lower limbs. Trauma to this *Marma* causes death due to convulsions. Understanding *Kshipra Marma* is very important in the clinical practice of *Ayurveda* due to being more prone to injury in labor or former classes while working in the paddy field. However, trauma has posed a major civil problem today. In this article, we will explain a complete summary of *Kshipra Marma* regarding its location, structural entity, modern anatomical correlation, and clinical anatomy.

Key words: *Marma, Snayu Marma, Kalantara Pranahara Marma, Snayu, Kshipra Marma*

INTRODUCTION

The subject of *Marma* and its traumatic effect is one of the very important, extraordinary, and dynamic *Ayurvedic* concepts that has tremendous value in health, disease, traumatology, everyday living, and spiritual practice. It is the pioneer in the science of traumatology, which has explored the vulnerable vital areas of the human body. There are many references

available about the *Marma* by various *Ayurvedic Samhitas*. But in *Sushrut Samhita*, *Maharshi Sushrut* has given more elaborative information about the among all the *Marmas*. He has given the fundamental meaning of *Marma*.

Marmasthanas is the seat of the *Dvadash Prana*.^[1] This is a force that controls body and mind both. *Marma* has been described by *Maharshi Sushruta* from the traumatological point of view. The ancient scriptures have strictly directed that these *Marmas* play a very important role in surgical procedures by avoiding injury to the adjacent vital points and due care should be taken in this regard even while doing surgeries. *Maharshi Sushruta* has described 107 vital points in our body.^[2] If these vital points are injured or traumatized, then it may lead to severe pain, disability, loss of function, loss of sensation, or even death. *Maharshi Sushruta* has given the importance of knowledge of *Marma* without which a surgeon cannot perform a skillful surgery.^[3] Hence it is rightly called as *Shalya Vishayardha*.^[4] *Marma* is the vital point where there is

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Submission Date: 13/11/2024 Accepted Date: 24/12/2024

Access this article online

Quick Response Code



Website: www.jaims.in

DOI: 10.21760/jaims.9.12.30

the confluence of *Mamsa, Sira, Snayu, Asthi,* and *Sandhi*. Here the *Prana* (element of life) resides naturally.^[5] Among these 107 *Marma*, our *Acharyas* have explained 44 *Marmas* in the *Shakha* (2 upper extremity and 2 lower extremity). *Acharyas* have explained that in the extremity there are the following *Marma's* i) *Kshipra* ii) *Talahrudaya* iii) *Kurcha* iv) *Kurchashira* v) *Manibhandha/Gulpha* vi) *Indrabasti* vii) *Kurpura/Janu* viii) *Ani* ix) *Bahavi/Urvi* x) *Lohitaksha* xi) *Kakshadhara/Vitap*. All of these *Marma* has their own importance but there is one *Marma* that is very important to study for a physician during his clinical practice i.e., *Kshipra Marma* which is located in the upper and lower extremities (in between the thumb and index finger in hand and in between the big toe and second toe in the foot). In this article, we have focused on the *Kshipra Marma* which is more prone to injury while working. Injury in *Kshipra Marma* leads to patients may die within a month or sometimes suddenly. Therefore, for the correct prognosis and treatment of these patients, all physicians need to know about *Kshipra Marma* and its devastating consequences.

The details of Kshipra Marma are as follows

According to *Shabdakalpadrum*, *Kshipra* takes its root from the word “*Kship*” and it has synonyms “*Sheeghra*” and “*Twarit*”.^[7] According to *Monier Williams Sanskrit-English dictionary* it is meant as to throw, cast, send, dispatch.^[8] According to *Maharshi Sushruta*, structurally it is explained as *Snayu Marma*.^[9] and *Kalantara Pranahara Marma* according to the prognosis of the injury.^[10] It is a total of four in number and is located in both the upper and lower extremities.^[11] Injury to this *Marma* causes death due to *Akshepaka* (convulsions).^[12]

SN	Name	Urdhwasakhagat Kshipra Marma	Adhosakhagat Kshipra Marma
1.	Number	2	2
2.	Structure	Snayu Marma	Snayu Marma
3.	Dimension	½ Anguli	½ Anguli

4.	Prognosis of injury	<i>Kalantara Pranahara Marma</i> . Both fiery and watery in the degree of vulnerability. ^[13] Sometimes it is <i>Sadyapranhar Marma</i> . ^[14]	<i>Kalantara Pranahara Marma</i> . Both fiery and watery in the degree of vulnerability. Sometimes it is <i>Sadyapranhar Marma</i> .
5.	Site	Situated in between the thumb and index finger, located bilaterally on the dorsal and palmar surfaces of the hand in the web formed by the dorsal interosseus ligament between the first and second metacarpal bones.	Situated in between the big toe and first toe, located bilaterally on the dorsal and palmar surfaces of the foot in the web formed by the deep transverse metatarsal ligament between the first and second metatarsal bones.
6.	Anatomical Structures	First intermetacarpal space (interval between the tendon of 1 st dorsal interosseus & adductor muscle) ^[15] Upper Limb: 1 st dorsal interosseous ligament Tendons of Abductor pollicis and deep portion of Flexor pollicis brevis Branches of Radial artery and Deep Palmar arch Radialis indicis artery Digital branches of Median nerve	First intermetatarsal space (interval between the tendon of 1 st dorsal interosseus & adductor muscle) ^[16] Lower Limb: Deep transverse metatarsal ligament between 1 st & 2 nd metatarsal bones Combined tendon of abductor hallucis and flexor hallucis brevis muscles Bifurcation of first dorsal metatarsal artery Deep peroneal nerve branch to great toe Bifurcation of first common digital nerve
7.	Symptoms if injured	<i>Aksepaka</i> (clonic spasm or convulsions) of the hand and ultimately leads to death.	<i>Aksepaka</i> (clonic spasm or convulsions) of the leg and ultimately leads to death. Injury may

	Injury may bleed from the palmar arch.	damage the artery and may cause bleeding and hematoma inside the plantar aponeurosis.
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MATERIALS AND METHODS

1. Literature regarding *Marma* from *Sushruta Samhita*, *Charak Samhita*, *Ashtanga Sangraha*, *Dalhana* commentary and *Ghanekar* commentary.
2. Modern literature from B.D.C. Human Anatomy, Gray’s Anatomy.
3. Review articles, journals, etc.

DISCUSSION

According to various *Ayurvedic Samhitas* the fundamental meaning of *Marma* as it is the confluence of *Mamsh*, *Sira*, *Snayu*, *Asthi*, and *Sandhi*. All the above five structures are present in each *Marma*. The high proportion of each structure varies in particular *Marma*. At the time of trauma, the components of the body like *Mamsa*, *Sira*, *Snayu*, etc. are affected, and the particular symptoms also vary accordingly.

According to *Maharshi Sushruta*, *Kshipra Marma* is the variety of *Snayu Marma*, and the location of *Kshipra Marma* is said to be between the thumb and index finger in the upper limb. In the lower limb, it is situated in between the big toe and the next toe.^[16] It is a *Snayu Marma*, because, this *Marma* is predominantly made up of *Snayu*.

Snayu Prayojan (function of Snayu)

Maharshi Shushrut has mentioned that *Snayu* is like ropes in our body. Like the rope holds the wooden planks together, *Snayu* holds the body together making it capable of weight transmitting to the central axis of the body, so long as the joints are fastened tightly by *Snayu* in many ways.^[17] So *Snayu* can be correlated with the ligaments and tendons because ligaments and tendons bind and support the joints and make a joint weight-transmitting part of the body. *Maharshi Sushruta* may have classified *Kshipra Marma* as *Snayu Marma*, due to which the area comprising *Kshipra Marm* is rich in ligaments and tendons. Therefore, it is

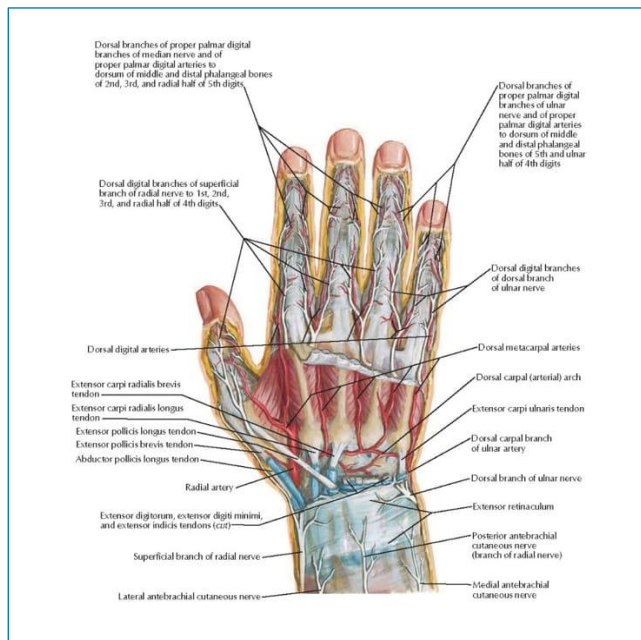
a *Snayu Marma*. Since the thumb is the master finger, the first web space was given more importance compared to others.

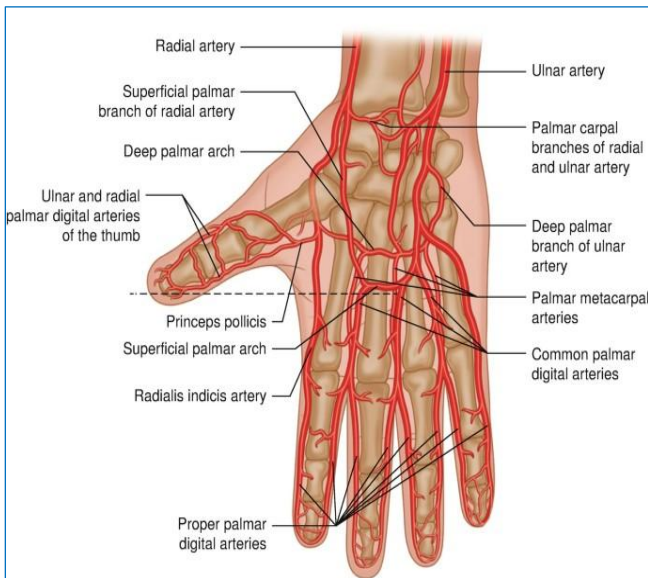
In the upper limbs, the tendon of the first palmar interosseous muscle receives blood supply from the first palmar metacarpal artery and the first dorsal interosseous muscle receives blood supply from the first dorsal metacarpal artery, both of said arteries are the branch of the radial artery.

In the palmar aspect the *arteria princeps pollicis* and *radialis indicis* combined as the first palmar metacarpal artery. At the distal border of the transverse head of the *adductor pollicis arteria radialis indicis* anastomoses with the *arteria princeps pollicis* and links with the superficial palmar arch.

In the dorsal aspect first, dorsal metacarpal artery is a branch of the radial artery just before it passes between the heads of the first dorsal interosseous, it divides almost at once into two branches supplying the adjacent sides of the pollex and index; the radial side of the pollex receives a branch direct from the radial artery itself.^[18]

Further, these are the continuation of the brachial artery and then the axillary artery which is the branch of the subclavian artery, which is the branch of the arch of the aorta, which carries oxygenated blood from the heart and supplies upper extremities.

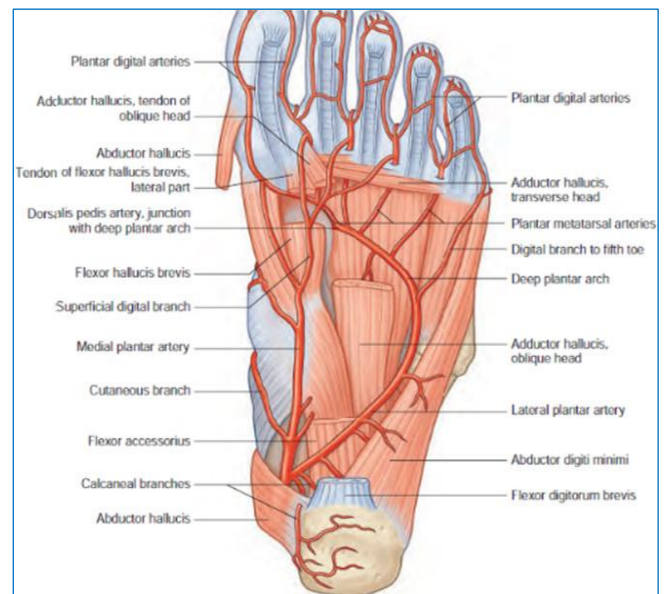




In the lower limbs, the tendon of extensor hallucis brevis muscle receives blood supply from the first dorsalis pedis artery which is the continuation of anterior tibial artery. The first dorsalis pedis artery passes medially along the dorsum to the proximal end of the first intermetatarsal space, where it turns into the sole between the heads of the first dorsal interosseous muscle to complete the planter arch where it provides the first planter metatarsal artery. The first planter metatarsal artery springs from the junction between the lateral plantar and dorsalis pedis arteries, sending a digital branch to the medial side of hallux.^[19] Tendon of flexor hallucis brevis muscle receives blood supply from first metatarsal artery which is the continuation of medial plantar artery. Medial plantar artery is the branch of posterior tibial artery. Anterior and posterior tibial artery is the continuation of popliteal artery and which is a deeply placed continuation of the femoral artery. Femoral artery is the branch of external iliac artery which is the largest branch of the common iliac artery, and it transports oxygenated blood into the lower extremities.

Maharshi Sushruta has also described *Kshipra Marma* as *Kalantara Pranahara* in nature. And sometimes, it can be *Sadyopranahara*. When the persons in whom hands and feet these *Kshipra Marmas* are less injured (near these fatal spots of *Kshipra Marma*), the veins there constrict, and a small quantity of blood flows out. The person though experiencing great suffering does

not die due to less blood loss, just like the tree when its branches are cut off. When *Kshipra Marma's* main fatal spots are injured, a large quantity of blood flows out and *Vata* produces pain, so the person dies due to hypovolemic shock, when these main fatal spots (1st metatarsal artery or 1st metacarpal artery) are injured just like the tree when its roots are cut off by instruments. Hence in persons in whom these (*Kshipra Marmas* main fatal spots) are injured, their hands and feet should be cut off (amputated) quickly at the wrist and ankle respectively.^[20] *Kshipra Marmabhighata* causes *Akshepaka* and *Marana*.^[21] The *Akshepaka* mentioned here is the *Vatavyadhi* as described by *Arundatta*.^[22] The severe blood loss in the injury of *Kshipra Marma* will lead to *Vata Prakopa*. Then the *Vayu* entering into *Dhamani* will cause severe spasms and convulsions. In *Akshepaka Roga*, the aggravated *Vata Dosha* permeates all *Dhamanis* leading to frequent & repeated convulsions and spasms of muscles. *Acharya Dalhana* has interpreted *Dhamani* as *Nadi* which possibly indicates the involvement of the nervous system in it. *Dalhana* has also mentioned that in this *Akshepaka* whole body takes place.^[23]



Now we know that labourers or former classes who mostly work in paddy areas are more injured in these fatal spots of *Kshipra Marmas* due to more use of hands and feet during work. *Clostridium tetani* is commonly found in moist and soil areas. So, they are infected easily by these bacteria. According to modern science, tetanus is caused by *Clostridium tetani*, when

these bacteria enter the body, they produce a toxin 'tetanospasmin' which interferes with motor neurons, and causes painful muscle contractions.^[24] The incubation period of Clostridium tetani is between 4 - 14 days which strikingly matches with the fact that the person injured, in the *Kalantara Pranhara Marma* will die within 15-30 days. Severe injury to the first metacarpal artery or palmar arch (in the upper limb) or the first plantar metatarsal artery or plantar arch (in the lower limb) may lead to excess blood loss, due to hypovolemic shock the death takes place suddenly.^[25]

CONCLUSION

The *Kshipra Marma* comes under the classification of *Kalantara Pranhara Marma* and sometimes *Sadhyopranhar Marma*. So, the person may die within a month of injury or sometimes suddenly. Injury to *Kshipra Marma* leads to *Akshepaka* (convulsions) leading to *Marana* (death). Space in between the root of the thumb and the index finger can be co-related with *Kshipra Marma*. If there is an injury to the main fatal spot of *Kshipra Marma* (first dorsal/palmer metacarpal artery and the first dorsal/plantar metatarsal artery), excessive blood loss occurs, and there is a lack of oxygen. To compensate for it, the patient moves the body with restlessness breathes rapidly with great force, and dies from convulsions at last. The convulsions are produced in conditions like bleeding or infections like tetanus bacilli. If heavy blood loss occurs then the result will be death suddenly due to hypovolemic shock but in case of any infection, it will take a few days.

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How to cite this article: Priyanka Upadhyay, Sushil Dwivedi, Sachin Dwivedi. Conceptual study of Kshipra Marma w.s.r. to its traumatic result. J Ayurveda Integr Med Sci 2024;12:227-232.

<http://dx.doi.org/10.21760/jaims.9.12.30>

Source of Support: Nil, **Conflict of Interest:** None declared.
