CODEN: WJAPAC Impact Factor: 3.87 ISSN: 3049-3013

World Journal of Advance Pharmaceutical Sciences

Volume 2, Issue 1. Page: 159-163 Review Article www.wjaps.com

A REVIEW: NEUROVASCULAR STRUCTURES OF KURCASIRA MARMA

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How to cite this Article Dr. Sonu Verma and Dr. H. H. Awasthi (2025). A REVIEW: NEUROVASCULAR STRUCTURES OF KURCASIRA MARMA. World Journal of Advance Pharmaceutical Sciences, 2(1), 159-163.

Article Info

Article Received: 18 April 2025,

Article Revised: 08 May 2025,

Article Accepted: 28 May 2025.

DOI: https://doi.org/10.5281/zenodo.15563799

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ABSTRACT

The chapter 'Marma Sharira' of Sushruta Samhita (ancient manuscript of Ayurveda) gives detailed information about the Marma, for completely understand the importance of Marma and keeping in mind the sites of Marma to avoid the injuries over the vital points (Marma) during surgery. Almost all the Samhitas have mentioned the 107 Marma. Out of 107 Marma, 27 are mentioned under the heading of Snayu Marma, 8 are mentioned in Rujakara Marma, and Kurcasira Marma is one of them. Aim of our study is to find out the appropriate structures related to Kurcasira Marma; and we try to compare the effect of trauma on the site of Marma with the modern science on the basis of some sign and symptoms mentioned in the Samhitas. The anatomical structures at site of Marma are observed and analysed through the cadaveric study and conceptual study through different texts and previous researches. For Kurcasira, it is below the Manibandha in both upper and lower extremity (Gulpha). The study concludes that, Urdhavshakhagata Kurcasira Marma is considered anatomically as the flexor and extensor retinaculum and trauma over the Median nerve in hand and Tibial nerve in foot under the retinaculum shows the symptoms of Ruja as mentioned in Samhitas. Urdhavshakhagata Kurcasira Marma corresponds to structures below the wrist joint, including various tendons and neurovascular components. Injury to this Marma causes pain and swelling due to the involvement of sensory nerves and vascular responses.

KEYWORD: Marma Vigyan, Urdhavshakhagata Kurcasira Marma, Snayu Marma, Prana, Flexor & Extensor Retinacula.

INTRODUCTION

Ayurveda is the treasure of knowledge which was developed and discovered by our great ancestors. To understand and to properly execute this knowledge we must have the knowledge of Sharir. The concept of Marma persists from vedic period. Although it is very much old by time frame but its principles are applicable even today like earlier era. Marma is described in almost all Ayurvedic texts, especially in the Shushruta Samhita, in the Prateyak Marma Nirdesh Sharir, the Trimarmiya Chikitsa chapter of the Charak Samhita, the Marma Vibhaga chapter in the Ashtang Sangrah, and the Sharir vichaya Sharir chapter in the Kashyapa samhita.[1]

Concept of Marma also given by Acharya Charak but has focused mainly on Tri-marmas (Shir, Hriday, Basti).[2] The union of Mansa, Sira, Snayu, Asthi and Sandhi are called as Marma. Acharya Sushruta stated every aspect of Marma like definition, location, constituents, dimensions, signs and symptoms of Marmaghat or injury to them. The vital points mentioned are so critical that any injury to them could result in immediate death, deformity, or intense pain.[3] According to Acharaya Sushruta, 107 Marmas are explained under five groups of structural classification as Mamsa, Sira, Asthi, Snayu and Sandhi Marma; five on the basis of location in the body as Shakhagata, Udaragata, Koshtagata, Prasthagata & Shira Grevagata Marma; five on the basis of effect of

injury as Sadhya Pranahara, Kalanatra Pranahara, Vishalyagana, Vaikalyakara & Rujakara Marma. Out of these, 27 are mentioned as Snayu Marma. In these Marmas, Kurcasira is mentioned under Shakhagat Marma, present 4 in number and it comes under heading of Rujakara a Marma.[4] It is the need of time to analyse and illustrate the exact location and anatomical structures explained under Kurcasira Marma, for its better understanding.

MATERIALS AND METHODS

This review integrates literature from classical Ayurvedic texts, modern period commentaries (1800 A.D. onwards), and medical journals to ascertain the anatomical and clinical relevance of Urdhavshakhagata, an upper extremity Marma & Marma related to their anatomical neurovascular structures.

Cadaveric Study

i) To visualize, study and verify all the regional anatomical structures i.e., Mamsa (muscular tissue), sira (blood vessels and nerves), Snayu (ligament, tendon and nervous tissue), Asthi (osseous tissue) and Sandhi (joints) related to Kurcasira Marma)

ii) To understand the anatomical structures of Kurcasira Marma, cadaveric study of hand and foot was carried out in the Keshav Ayurvedic Medical College & Hospital, Jhalawar, Rajasthan. All the procedure was done by following the Cunningham's dissector.

Kurcasira Marma Review

In Monier William's dictionary, "Kurcasira Marma" is referred to as the "Shira of Kurca" in Shabdhakalpadruma. Additionally, it is described as the upper part of the palm of the hand and foot. Although it is initially mentioned as being below the "Gulpha Sandhi," it is later clarified that the "Manibandha Marma" in the upper limb is homologous to the "Gulpha Marma" in the lower limb.[5,6]

Location: "It is situated just below the Manibandha Sandhi according to Vaghbatta." Adhoshakhagata Kurcasira Marma is located below the Gulpha Sandhi on both sides. Kurcasira means the head of Kurca, so the position of Marma should be near the head of Kurca.[7] The head of Kurca should be the proximal end of Kurca where all structures are held together. Kurcasira Marma has following features-

Classification[8]

- Rachananusara: Snayu Marma
- Pramananusara: one Angula
- Parinamanusara: Rujakara a
- Stananusara: 2- Adhoshakhagata, 2 - Urdhavshakhagata)
- Panchabautikatwa: Agneya and Vayavya

An injury to the Marma will lead to Sopha and Ruja (pain and swelling).[9]

Regional Anatomy[10]

Dr. Ghanekara considered deltoid ligaments

Dr. L. P. Gupta, Dr. R.R. Pathak involved underneath of this Marma is-

- The intercarpal,
- Transverse carpal ligaments,
- Ulnar artery,
- Median nerve
- Intercarpal articulation.

Dr. V. S. Patil has included

- The tendon of extensor digitorum longus,
- Pollicis longus and brevis

Kurcasira Marma of (Urdhavshakhagata) the upper limb or hand: Anatomically correlated with[11]-

- Tendon of abductor pollicis longus,
- Tendon of flexor carpi radialis,
- Tendon of extensor carpi radialis longus,
- Tendon of extensor pollicis longus and brevis.

If injured in sports, impairment of the flexion and abduction of the wrist, bleeding from the radial artery and pain due to injury to the radial nerve.

Flexor retinaculum/Kurcasira of upper extremity (Dorsal and Palmar region of hand)- It is situated just below and both sides of the wrist joint. So, the corresponding anatomical structures would be the structures present at dorsal and palmar region of hand just below the wrist joint. Basically, it is a Snayu Marma, so probable anatomical structure would be the tendons enclosed in extensor and flexor retinaculum of the hand. Kurca, is a brush like structure made up of confluence of Snayu and Dhamani and on etymologically speaking the Kurcasira should be the structure resembling the sira (head) of the Kurca.[12] The flexor and extensor retinaculum are specialized band of deep fascia present in the region of wrist and hand. The distal transverse crease corresponds to the proximal border of the flexor retinaculum.

Flexor retinaculum of the upper extremity

Flexor retinaculum (Latin to hold back) is a strong fibrous band which bridges the anterior concavity of the carpus and converts it into a tunnel, the carpal tunnel.

Medially: 1. The pisiform bone,
2. The hook of the hamate.

Laterally: 1. The tubercle of the scaphoid
2. The crest of the trapezium

On either side- the retinaculum has a slip

1. The lateral deep slip is attached to the medial lip of the groove on the trapezium which is thus converted into a tunnel for the tendon of the flexor carpi radialis.
2. The medial superficial slip (volar carpal ligament) is also attached to the pisiform bone. The ulnar vessels and nerves pass deep to this slip.[13]

Relations: The structures passing superficial to the flexor retinaculum are:
i. The palmar cutaneous branch of the median nerve.
ii. The tendon of the palmaris longus.
iii. The palmar cutaneous branch of the ulnar nerve.
iv. The ulnar vessels & ulnar nerve.
The thenar and hypothenar muscles arise from the retinaculum.

The structures passing deep to the flexor retinaculum are:
i. The median nerve.
ii. Four tendons of the flexor digitorum superficialis.
iii. Four tendons of the flexor digitorum profundus.
iv. The tendon of the flexor pollicis longus.
v. The ulnar bursa
vi. The radial bursa
vii. The tendon of the flexor carpi radialis lies between the retinaculum and its deep slip, in the groove on the trapezium.

Extensor Retinaculum of upper extremity
The deep fascia on the back of the wrist is thickened to form the extensor retinaculum which holds the extensor tendons in place. It is an oblique band, directed downwards and medially. It is about 2 cm broad vertically.
Laterally: Lower part of the sharp anterior border of the radius.
Medially: i. Styloid process of the ulna
ii. Triquetral
iii. Pisiform

Compartments: The retinaculum sends down septa which are attached to the longitudinal ridges on the posterior surface of the lower end of radius. In this way, 6 Osseo-fascial compartments are formed on the back of the wrist. Each compartment is lined by a synovial sheath, which is reflected onto the contained tendons. The following structures Pass beneath the extensor retinaculum from medial to lateral-
1. The tendon of extensor carpi ulnaris
2. The tendon of extensor digiti minimi
3. The tendon of extensor digitorum and extensor indicis and anterior interosseous artery
4. The tendon of extensor pollicis longus
5. The tendon of extensor carpi radialis longus and
6. extensor carpi radialis brevis,
7. The tendon of extensor pollicis brevis and
8. abductor pollicis longus, have a separate synovial sheath but share a common compartment.[14]

DISCUSSION
Urdhavshakhagata Kurcasira Marma is situated below and on one side of Manibandha Sandhi, an injury to it gives rise pain and swelling of the affected area. It is a Snayu Marma in nature, Rujakara a in consequences and extends an area of Measurement of this Marma has been given one Angula. So, the corresponding anatomical structures would be the structures present at dorsal and palmar region of hand just below the wrist joint. Basically, it is a Snayu Marma, so probable anatomical structure would be the tendons enclosed in extensor and flexor retinaculum of the hand. Kurca is a brus like structure made up of confluence of Snayu and Dhamani and on etymologically speaking the Kurcasira should be the structure resembling the sira (head) of the Kurca. The structure which lies in the Kurcasira Marma.[15]-

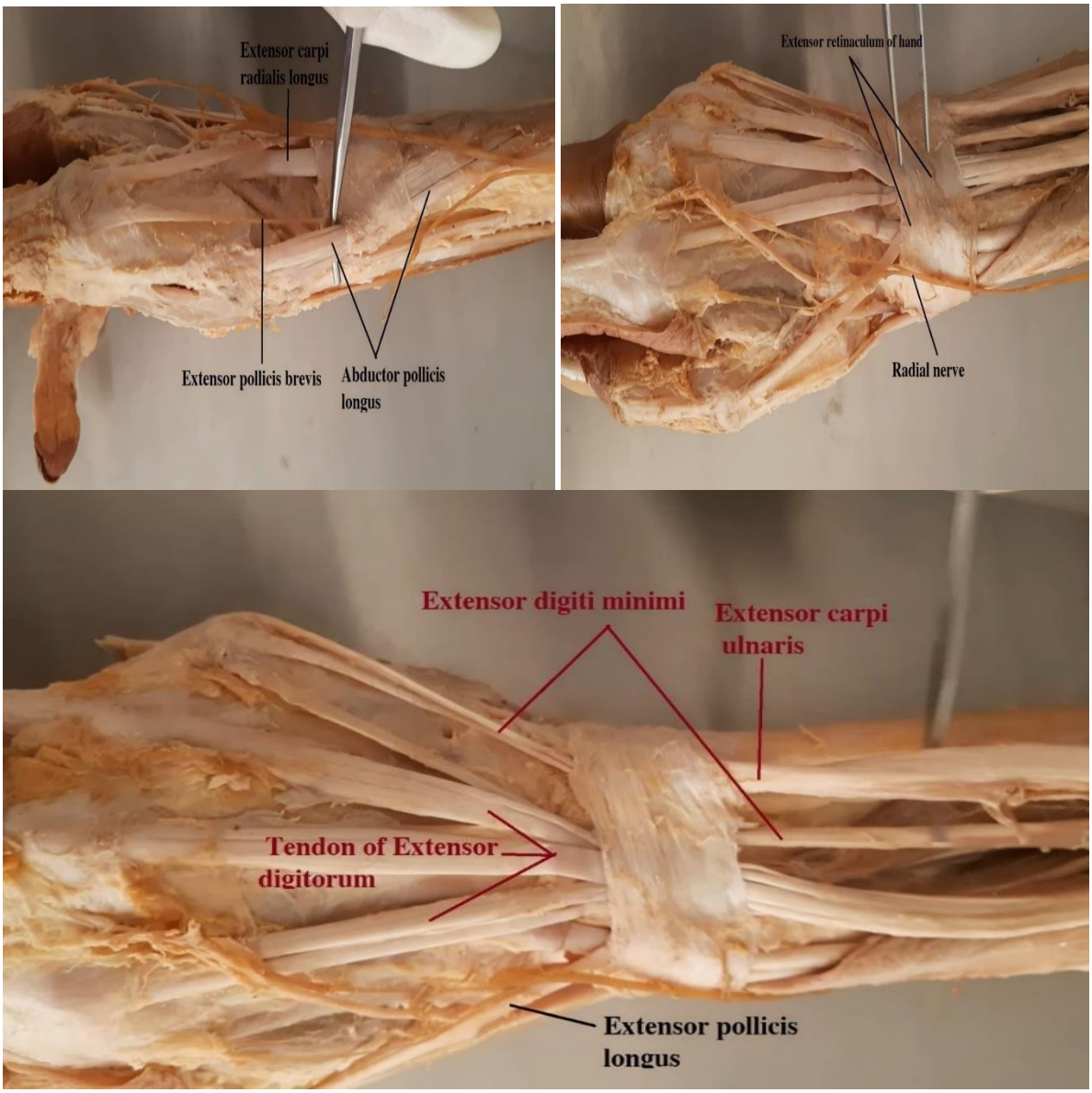
❖ **Mamsa (Muscles)**
- abductor pollicis longus,
- Extensor digitorum brevis,
- Adductor pollicis,
- Opponens pollicis,
- Opponens digiti minimi.

❖ **Sira (vessels and nerves)**
- Branches of radial & ulnar artery,
- Radial & ulnar artery
- Median nerve
- Branches of superficial & deep palmer arch,
- Dorsal interossei Nerve

❖ **Snayu (ligaments and tendons)**
- Deltoid ligament,
- Tendons of the flexor digitorium superficialis
- Tendons of flexor digitorium profundus
- Dorsal radio carpal & dorsal intercarpal ligament

❖ **Asthi (bones)**
- Carpal bone of distal row,
- Metacarpals,
- Carpometacarpal joint,
- Inferior Radio-ulnar joint

Any injury to the structures in fracture of Scaphoid, tenosynovitis may lead to following deformities such as the swelling of the digits and their movements becomes painful, impairment of the extension/ flexion and abduction of the wrist and thumb, bleeding from the radial artery and pain due to injury to the radial nerve. These symptoms may relate to the Kurcasira Marma. It can be compared with radial collateral ligament and transverse carpal ligament. Injury to these ligaments may lead to intense pain and swelling. Also, here retinacula and structures lying under them also proves it as Snayu Marma by showing Snayu predominance. As per the Marma Viddhalakshana, trauma on Kurcasira region leads to Ruja and Shopha, it may occur by injury to structures like nerves and tendons underlying the retinacula. As the pain is the chief complaint after the injury, it shows the Rujakara a property of the Kurcasira Marma.



CONCLUSION

By assuming of the above study, we conclude that being the Snayu Marma, there is predominance of Snayu in the region of Kurcasira Marma as per mentioned by our Acharya's. And retinaculae are taken as the Kurcasira Marma; median nerve (in hands) and tibial nerve (in feet), if gets injured produces the symptoms as mentioned by our Acharya's in Samhitas. Anatomically structures are found out the tendon of abductor pollicis longus, Tendon of flexor carpi radialis, tendon of extensor carpi radialis longus, tendon of extensor pollicis longus and brevis & neurovascular structures are median & radial artery, interosseous artery & nerve with their branches. If injured in sports, Impairment of the flexion and abduction of the wrist, bleeding from the radial artery and pain due to injury to the radial nerve.

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