A CRITICO ANATOMICAL STUDY OF KOORCHA AND KOORCHASIRA MARMA

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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. Marma is known as vital point on which trauma, can lead to disability, death sooner or later or serious consequences. Almost all the Samhitas have mentioned the 107 Marma. Out of 107 Marma, 27 are mentioned under the heading of Snayu Marma. Koorcha and Koorchasira marma are among the Snayu marma, located in Shakhas. Aim of our study is to find out the appropriate structures related to Koorcha and Koorchasira 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 Koorcha Marma, it is above Kshipra Marma and for Koorchasira, it is below the Manibandha in both upper and lower extremity (Gulpha). The study concludes that, the extensor and flexor tendons may be taken anatomically as the Koorcha Marma and trauma over the lumbricals are responsible for the Vaikalyta as mentioned by Acharayas. Koorchasira 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.

Keywords: Marma, Koorcha Marma, Koorchasira Marma

INTRODUCTION
Marma, a part of Ayurvedic SHAREERA RACHNA is of immense value when it comes to protection of body and its parts during surgery and traumatic injuries. Marma being the vital structures of body are also known as the seats of Prana or life element. Marma is defined as the combination of Mamsa, Sira, Snayu, Asthi and Sandhi. Marma are described nearly by all Ayurvedic texts especially Shushruta Samhita in Prateyak Marma Nirdesh Sharir, Trimarmiya Chikitsa chapter of Charak Samhita, Marma Vibhaga chapter in Ashtang Sangrah and Sharir vichaya Sharir chapter in Kashyapa samhita. In Shusruta Samhita 107 Marmas are explained under five groups of structural classification as Mamsa Marma, Sira Marma, Asthi Marma, Snayu Marma and Sandhi Marmas; five on the basis of location in the body as
Shakhagata Marma, Udaragata Marma, Koshtagata Marma, Prasthanagata Marma, Shira Grevgata Marma; five on the basis of effect of injury as Sadhya Pranahara Marma, Kalanatra Pranahara Marma, Vishalyagana Marma, Vaikalyakara Marma, Rujakara Marma. Out of these 27 are Snayu Marma. In these Marmas, Koorcha and Koorchasira are mentioned under Shakhagata Marma both are present 4 in number. Koorcha Marma is one of the Vaikalyakara and Koorchasira comes under heading of Rujakara marma. The knowledge of clinical manifestation shown by injury to these places as described by the Ayurvedic texts can be used in better understanding of the regional anatomy of these sites.

**Objectives**
1. To critically analyze the anatomical structures related to Koorcha and Koorchashira Marma in modern parlance.
2. To do review on the clinical importance described in literature related to Koorcha & Koorchashira Marma.

**Materials & Methods:**
- **Conceptual Study:** Asserting the most appropriate position of Koorch & Koorchashira Marma on the basis of data collection from different classical texts, Ayurvedic literature, commentaries of modern period (1800A.D.-onwards), medical journals.
- **Cadaveric Study:** To understand the anatomical structures of Koorcha and Koorchashira Marma, cadaveric study of hand and foot was carried out in the P.G Department of Rachana Sharira, Rishikul Campus, Haridwar, Uttarakhand Ayurved University. All the procedure was done by following the Cunningham’s dissector.

**Marma Review:**
- **Koorcha Marma:** In Monier William’s dictionary it is meant as a bunch of anything, bundle of grass etc. It is situated two Angula above the Kshipra marma. It is also present in lower extremity above the Kshipra Marma.

**Classification:** Sakha Marma², Vaikalyakara Marma³, Swapanitala Pramana⁴ Chatursankhya

Sign when gets injured: Bhramana and Vepana of the foot. Vaghbat has used the word Kampa instead of Vepana.¹

The term Kampa has been assigned with the meanings trembling, tremor, shaking etc. in Monier William’s dictionary and the word Vepana has been assigned with the meaning quivering, trembling, fluttering etc.

**Koorchashira:** It has been defined as the Shira of Kurcha in Shadbhakalpadruma. It has been meant as the upper part of the palm of the hand and foot in Monier William’s dictionary. Though it is mentioned, it is present below the Gulpha Sandhi, it has been cleared later that the Manibandha Marma in upper limb is homologous to the Gulpha Marma in lower limb. It is situated just below the Manibandha Sandhi according to Vaghbatta.⁵

**Classification:** Sakha Marma², Rujakara Marma⁶, Dwayangula Paramamna⁴ Chatursankhya

An injury to the Marma will lead to Sopha and Ruja (pain and swelling).¹

**Cadaveric Study:** The dissection on 4 hands of two cadavers was carried out in the department of Rachana Sharira, Rishikul Campus, Haridwar as per the Cunningham's manual. Following structures were revealed by keeping in mind the site of Koorcha and Koorchasira Marma as per mentioned in literatures.

**In Hand:**
Skin and Superficial fascia around the region of the palm was removed.

Flexor retinaculum which is a fibrous band and modification of deep fascia was identified. It was attached to the Scaphoid and Trapezium laterally. Medially it is attached to the Pisiform and Hamate bones.

The median nerve and the four muscles of the flexor compartment were observed passing deep to the carpal tunnel.
- Four tendons of the flexor digitorum superficialis
- Four tendons of flexor digitorium profundus
- Tendon of flexor pollicis longus
- Tendon of flexor carpi
- Palmaris Longus was found

Palmar apponeurosis is a thick triangular portion of deep fascia that lies in the central region of the palm. Its apex at flexor retinaculum, base near the head of
metacarpals and its four slips were identified. Originating from the tendons of flexor digitorum profundus four lumbricals were observed. The first two were unipennate and the remaining two bipennate and were inserted to the dorsal digital expansions of the corresponding digits. The four palmar interosseus muscles were spotted positioned between shaft of metacarpal bones. Extensor retinaculum: It is an oblique fibrous band and modification of deep fascia was observed. Laterally it was found attached to the anterior border of the radius above the styloid process and medially to the pisiform and triquetral bones. The nine muscles of the extensor compartment were identified.

1. Extensor Carpi Radialis Longus
2. Extensor Carpi Radialis Brevis
3. Extensor Digits Minimi
4. Extensor Carpi Ulnaris
5. Abductor Pollicis Longus was found
6. Extensor Pollicis Longus
7. Extensor Pollicis Brevis
8. Extensor Indicis
9. Extensor Digitorum

The four dorsal interossei were also found placed between the metacarpal.

In Foot:
Skin and Superficial fascia of the foot was removed, following structures were seen:
Superior Extensor Retinaculum: It was attached to the lower part of anterior border of the tibia medially and to the lower part of anterior border of fibula laterally.
Inferior Extensor Retinaculum: It is Y shaped band of deep fascia, stem is attached to the non-articular part of the superior surface of calcaneum, and the upper band to anterior border of the medial malleolus and lower band passes downwards and medially to plantar aponeurosis.
Structures that pass beneath the Extensor retinaculum from Medial to Lateral:
1. Tibialis anterior tendon.
2. Extensor hallucis longus tendon
3. Extensor digitorum longus tendons
4. Peroneus tertius. Anterior tibial artery Deep peroneal nerve

Flexor Retinaculum: It is dense deep fascia attached anteriorly to the posterior border and tip of medial malleolus and posteriorly and laterally to medial tubercle of calcaneum.
Structures that pass beneath the flexor retinaculum from medial to lateral:
1. Tibialis posterior tendon.
2. Flexor digitorum longus
3. Flexor hallucis longus.
4. Posterior tibial artery
5. Tibial nerve

Structures that pass beneath the superior peroneal retinaculum:
1. Tendon of peroneus longus
2. Tendon of peroneus brevis, Plantar aponeurosis
3. Flexor digitorum brevis, Abductor hallucis, Flexor hallucis brevis, Adductor hallucis were identified on the medial side of sole foot. Four lumbricals muscles are originating from the tendons of flexor digitorum longus. The three palmar interosseus muscles were spotted positioned between the shaft of the metacarpal bones and four dorsal interosseus muscles were also seen.

DISCUSSION
From the 27 Snayu Marma, Koorcha and Koorchasira being the main heading, their anatomical structures were analysed through conceptual, cadaveric study. The shape and position, as per mentioned by Acharya in our classical texts; we relate them with the structures found on the site of Marma through cadaveric study, to evaluate the symptoms of the Marma after the trauma, it is more important to understand the structural anatomy related to Marma.
Koorcha: The word Kurcha stands for the shape of the brush. According to Shushruta, it is mentioned two Angula above the Kshipra Marma. Two Angula is taken towards the region of wrist joint as the Marma are described in human from the lower point of extremities to upwards. The marma is of swapanitala paramana and is Vaikalyakara type, as it causes Has-
ta Bhramana and Vepana & Kampa (according to Vaghbatta). As the position of Koorcha Marma is 2 Angula above the Kshipra Marma, now the position of Kshipra should be assumed. According to Acharya Shushruta, Kshipra is located in area between the thumb and index finger (first and second metacarpal bone), and the Pramana of marma is half angula. So, we assumed a point for Kshipra Marma and measures 2 Angula from that point, here the brush like appearance is formed by the tendons of the flexor and extensor muscles and nerves and vessels coming out from the retinaculum in the palmar area of hand. The signs of Marma Vidhha Lakshanas according to Acharya Shushruta are Hasta Bhramana and Vepana and according to Ashtanga Hrudaya the signs are Hasta Bhramana and Kampa. This can be correlated as tremors and rotation of hand to the medial or lateral side. When supply to anyone of the group of twenty intrinsic muscles of the hand is impaired, it will lead to hyperextension of metacarpophalangeal joints as in claw hand and wrist drop. This can be related with Hasta Bhramana. In claw hand, deformity or abnormal attitude of hand develops due to paralysis of lumbricals (as they flex the MCP joint) caused by ulnar nerve injury, which shows the Vaiykalayata.

Same as in lower extremity, site of Koorcha Marma is assumed 2 Angula above the Kshipra Marma. As per the Vidhha Lakshana, here it can be related with the rotation of foot to abnormal position. When supply to anyone of the tendons and intrinsic muscle gets obstructed due to some trauma, it will leads to weakness in muscles or inability to plantar flex the ankle and the toes, as in tibial nerve injury and foot drop which also shows Vaiykalayata; this can be related with Padha Bhramana. In tibial nerve injury, people are unable to plantar flex their ankle or flex their toes, loss of sensation also occurs on sole of the foot; in this tibial nerve supplies flexor digitorum longus, and lumbricals originates from their tendons. Here lumbricals also got paralysed and prevents the flexion of MCP joints. This has the effect of making the limb “too long”, this shows the Vaikalyakar property of the Koorcha marma.

**Koorchashira Marma:** The etymology of the word suggests that, its name is so because it is like the structure which is fastened up at one end like a brush. According to Acharaya Shushruta its region is below and on both sides of the Manibandha, it is of one Angula Pramana and of Rujakara type because it causes Ruja and Shopha. The situation of Koorchasira is just below and both sides of the wrist joints. So, the anatomical structures would be the structures present at dorsal and palmar region of the hand just below the wrist joint. By assuming the shape of the Marma, it has to be considered as the flexor and extensor retinaculum, as it is a fibrous band merely 2.5-3cm transversely, with a similar proximodigital length; they bind or cover the tendons of muscles which comes out in form of brush. Here the Koorcha or brush like appearance is formed by the various tendons and the nerves and Koorchasira should be the structure resembling the Shira of Koorcha.

The reason for which Koorcha and Koorchasira is classified under Snayu marma is because of the predominance of Snayu in the region, injury to Snayu is very painful, and produce disability unparallel to bone, muscle, vein and joints in terms of intensity and loss of function. As it is mentioned under Rujakara Marma category, its Viddhalakshana are Ruja and Shopha. When a trauma occurs over the Marma area (retinacula), the nerves and tendons passing under the retinaculum get injured, leading to severe pain and inflammation, as in carpal tunnel syndrome; here the severe pain occurred by the trauma is the reason behind the Rujakara property of the Marma. In carpal tunnel syndrome, median nerve gets compressed in the carpal tunnel leads to severe pain and wasting of thenar muscles. So, the predominant sign of injury to this Marma has to be Ruja.

Same like in upper extremity, the lower extremity Koorchasira is under the Gulpha and so the anatomical structures would be present on the dorsal and plantar aspect of the foot. By assuming the shape of Koorchasira in foot, it is related with the retinaculum of the foot as its reveals as Koorchasira. All the extensor and flexor tendons passing under the retinaculum bind under the retinaculum, gives appearance of
Sira of Koorcha. There are three retinacula: flexor, extensor and peroneal. Also, here retinaculae and structures lying under them also proves it as Snayu Marma by showing Snayu predominance. As per the Marma Viddhalakshana, trauma on Koorchasira region leads to Ruja and Shopha, it may occur by injury to structures like nerves and tendons underlying the retinacula. As in tarsal tunnel syndrome, the compression of tibial nerve within the fibrous tunnel due to some trauma under flexor retinaculum, this is associated with pain and parasthesia in sole. As the pain is the chief complaint after the injury, it shows the Rujakara property of the Koorchasira Marma.

CONCLUSION

We concluded by assuming the flexor and extensor tendons in hand and the feet as Koorcha Marma, as trauma over lumbricals in this region gives the symptoms as per mentioned by our Acharayas. And retinaculae are taken as the Koorchasira Marma; median nerve (in hands) and tibial nerve (in feet), if gets injured produces the symptoms as mentioned by our Acharayas in Samhitas.

REFERENCES

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