



## CADAVERIC STUDY OF KURPARA MARMA

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**ABSTRACT** Acharya Sushruta in Sushruta Samhita widely discusses the anatomy and provides important anatomical conceptual information. One such concept described by Acharya Sushruta is Marma. Marma's are explained as the vital points in the body. Marma means the confluence of Mamsa, Sira, Snayu, Asthi and Sandhi. Injury to these vital points may lead to death, disability and disease. There are a total of 107 Marma in the human body. Acharya Sushruta classified marma into five types i.e. Mamsa, Sira, Snayu, Asthi and Sandhi Marma. Kurpara Marma is one among the twenty Sandhi Marma mentioned by Acharya Sushruta. It is a vaikalyakara marma and located at the junction of bahu and prabahu i.e. elbow joint. So cadaveric dissection of elbow joint in relation to kurpara marma can be carried out in order to fix the exact location of kurpara marma and to find out its components. This article describes anatomical location and contents of Kurpara Marma and applied anatomy related to it with the help of cadaveric dissection.

**KEYWORDS :** Anatomy, Sushruta, Dissection, Marma, Kurpara.

## INTRODUCTION

Literal meaning of ayurveda is science of life. This science deals with the whole life with healthy and unhealthy individuals. The Marma is one of the exclusive concept of Ayurveda which has been well developed by keen observations, especially at the time of surgical procedures because of its fatal traumatic effects. These are very special and vital points in the body, special because they are the sites of prana<sup>1</sup> (Life). Acharya Sushruta in Pratyeka marma nirvesha sharira adhyaya<sup>2</sup>, Acharya Charaka in Trimarmiya siddhi adhyaya<sup>3</sup> and Trimarmiya chikitsa adhyaya<sup>4</sup>, Vagbhata in marmavibhagya<sup>5</sup> have made classical description throwing light on every aspect of marma. The term marma is defined as "marayati iti marma" that structure in the body where if any injury or trauma is made causes death<sup>6</sup>. Marma is constituted by the confluence of Mamsa (Muscle), Sira (vessels), Snayu (ligament), Asthi(bone), sandhi (joints)<sup>7</sup>. There are 107 marma in the human body mentioned by Acharya Sushruta. Kurpara Marma is one of the delicate and vital point of the body located in both upper limbs which is described in the area of Kurpara sandhi (elbow joints). It is exactly located at the junction of the bahu (arm) and prabahu (forearm). Structurally it is described as Sandhi Marma<sup>8</sup>, situated in urdhvashakha (upper extremities). Kurpara sandhi marma prognostically comes under Vaikalyakar Marma having predominance of saumya elements, vikal means deform or cripple, so when Kurpara marma get injured Sushruta said it causes loss of function of forearm ("Kurparakhye kuni")<sup>9</sup>. Kurpara marma is devoid of mamsa, sira and snayu and contains mainly asthi and sandhi predominantly so damage to these structures at elbow joint results into temporary or permanent disability of elbow joint or loss of function. Description of location and injurious effects of Kurpara marma are similar to the structure of elbow joint and its clinical anatomy.

Elbow joint connects the arm to the forearm. It is a synovial joint of the hinge variety between the lower end of humerus and the upper end of radius and ulna<sup>10</sup>. Superior surface of the head of radius articulates with capitulum of humerus and trochlear notch of the ulna articulates with trochlea of the humerus. The elbow joint is continuous with the superior radio ulnar joint. In full flexion the fossae present immediately above the capitulum and trochlea receive the head of radius and coronoid process of the ulna and in full extension, a deep fossa which is present posteriorly receives the olecranon process. There are commonly two separate articular surface in the trochlear notch, one on the olecranon and the other coronoid process. The elbow joint is stable because of the wrench shaped articular surface of the olecranon and the pulley shaped trochlea of the humerus. The elbow joint is capable of flexion and extension. Elbow joint is commonly injured in childhood. Elbow dislocations are common and mostly are of posterior side. Posterior dislocation usually follows falling on the outstretched hand. Posterior dislocation is common in children because the parts of the bones that stabilize the joint are incompletely developed. Avulsion of the epiphysis of the medial epicondyle is common in childhood because medial ligament is much stronger than

the bond of union between epiphysis and the diaphysis. The problem affecting the joint could be intra articular or extra articular. TB arthritis, rheumatoid arthritis are some of the common intra articular problems. While tennis elbow, golfers elbow, students elbow are some of the extra articular problems of elbow. Supracondylar fracture, dislocation of elbow, fracture of head of radius are some of the common elbow injuries.

Knowledge of Kurpara sandhi marma is very important in sports too because there are certain sports in which there is always a possibility of Kurpara sandhi marma injury specially in tennis, badminton and cricket for example - Tennis elbow, Golfers elbow, Student elbow, Supracondylar fracture. For understanding the location and structure of Marma in relation to elbow joint and for management of trauma to this Marma one should know the exact anatomical structure which comes under Kurpara Marma. So, this study needs to explore the anatomical structures of Kurpara Marma and its specific location according to ayurvedic texts and modern anatomy.

## RESEARCH QUESTION

1. What is the exact location and the structural components of Kurpara Marma ?
2. What type of effect occurs on injury to Kurpara Marma ?

## HYPOTHESIS

Since it is a descriptive study, hypothesis is not stated.

## AIM

To fix the location of Kurpara Marma and to identify its structural components.

## OBJECTIVES

1. To identify the proximity of anatomical structures to Kurpara Marma.
2. To study the clinical anatomy of Kurpara Marma and to prove its vaikalyakara effect in the light of Sushruta Samhita and Modern Anatomy.

## MATERIALS REQUIRED

## For structural study of Kurpara Marma :

- a. Cadaver with well formed elbow joint.
- b. Scalpel
- c. Surgical Scissor
- d. Plain & toothed forceps
- e. Retractors
- f. Camera

## METHODOLOGY

- **Review of literature :** All relevant references were collected in both Ayurved & Modern Science.
- **Experimental work :** Cadaveric dissection in the region of

Kurpara Sandhi i.e. Elbow Joint which contains Kurpara Marma. (Dissection was done according to the Cunningham's manual of practical anatomy)

- **Clinical Anatomy** : Applied aspect of Elbow joint along with its contents were critically analysed in order to prove the vaikalyakara effect of Kurpara Marmaghata.

#### Inclusion Criteria

- Selection of cadaver strictly well preserved Kurpara Sandhi region without any deformity or abnormality.
- Cadaver of all age group, sex, race, religion having well formed elbow joint.

#### Exclusion Criteria

- Cadaver with poor preservation, maldeveloped elbow joint, amputated upper limb, congenital deformities will be excluded.

#### OBSERVATION



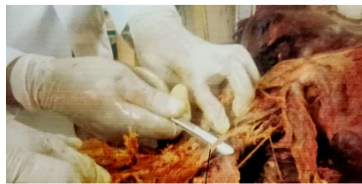
Marking of Incision

Boundaries of Cubital Fossa



Brachial Artery

Ulnar Nerve



Median Nerve

#### CADAVERIC DISSECTION

##### Dissection done on:-

The cadaver available in the Department of Rachana-Sharir in CBPACS.

1. Steps of dissection
2. Layer wise structures found in that region.

Criteria for selection of dissection region -

Vagbhata mentioned :

**a) Vishama Spandana** : Pulsation of Brachial Artery medially to elbow joint.

**b) Pain on pressure** : Pressure to posterior to medial condyle of humerus because of presence of ulnar nerve.

**Three fully unidirectional extended fingers i.e. index, middle and ring finger were kept from above downwards on the elbow joint that these three well close to each other.**

(Dissection was done following the steps given in Cunningham's Manual of Practical Anatomy)

#### Cadaveric Study (Steps of dissection)

The entire dissection was done in following steps-

- Measuring and defining the Kurpara marma as defined by Acharya Sushruta.
- Drawing two horizontal planes each at a distance of one and a half angula from the centre of patella.
- Dissection initiated according to protocol laid by Cunningham's manual.
- A section cut of Kurpara Sandhi was performed on the identified point.

- All anatomical structures as defined by Acharya Sushruta in definition of Marma were explored and self-observation is established.

#### STRUCTURES FOUND IN THAT REGION

##### • Mamsa in Kurpara Marma

- a) Bicipital Aponeurosis
- b) Brachialis
- c) Brachioradialis
- d) Flexor carpi ulnaris
- e) Flexor carpi radialis
- f) Palmaris longus

##### • Sira in Kurpara Marma

- a) Bifurcation of Brachial Artery into radial and ulnar artery.
- b) Ulnar Nerve
- c) Radial Nerve
- d) Median Nerve

##### • Snayu in Kurpara Marma

- a) Radial Collateral Ligament
- b) Ulnar Collateral Ligament

##### • Asthi in Kurpara Marma

- a) Trochlea & Capitulum
- b) Upper end of Radius & Ulna
- c) Olecranon process
- d) Coronoid process

##### • Sandhi in Kurpara Marma

- a) Humero-ulnar joint
- b) Humero-radial joint
- c) Radio-ulnar joint

#### Clinical Anatomy of Kurpara (Elbow Joint)<sup>11</sup>

- **Tennis Elbow** : Occurs in tennis players. Abrupt pronation with fully extended elbow may lead to pain and tenderness over the lateral epicondyle which gives attachment to common extensor origin. This is due to
  - a) Sprain of radial collateral ligament.
  - b) Tearing of fibres of the extensor carpi radialis brevis.
  - c) Recent researches have pointed out that it is more of a degenerative condition rather than inflammatory condition.
- **Student's Elbow** : Also known as Miner's Elbow. It is characterized by effusion into the bursa over the subcutaneous posterior surface of the olecranon process. Students during lectures support their head (for sleeping) with their hands with flexed elbows. The bursa on the olecranon process gets inflamed.
- **Golfer's Elbow** : It is the microtrauma of medial epicondyle of humerus, occurs commonly in golf players. The common flexor origin undergoes repetitive strain and results in a painful condition on the medial side of the elbow.
- **Supracondylar Fracture** : It is common in young age. It is produced by a fall on the outstretched hand. The lower fragment is mostly displaced backwards, so that the elbow is unduly prominent, as in dislocation of the elbow joint. this fracture may cause injury to the median nerve. It may also lead to Volkmann's ischaemic contracture caused by occlusion of the brachial artery.

#### INFERENCE FROM CLINICAL ANATOMY

In almost all clinical conditions of elbow the major clinical feature is functional deformity i.e. "Vikalta". Even after surgical repair in the ligament injuries there is some sort of pain and functional deformity left. That means injury to Kurpara Marma in the region of kurpara sandhi leads to Vikalta. That's why it is classified under Vaikalyakar Marma.

#### DISCUSSION

- Kurpara Sandhi is a joint comprising of Prakoshtha & Praganda asthi which can be correlated to elbow joint. Angula pramana of Kurpara Marma as mentioned by Acharya Sushruta is three (3) angula. Upon analyzing the specified area in this joint, it comprises of many anatomical structures (muscles, vessels, ligaments, bones, joint). So all the structures present within the marked region (three fully unidirectional extended fingers i.e. index, middle and ring finger kept from above downwards on the elbow joint that these three well close to each other) should be considered as Kurpara Marma.

- According to the above research (cadaveric study) along with the literary work done, the main clinical feature due to kurpara marma aghata is "kuni", which means weakness (at forearm) and functional deformity.
- One of the main clinical feature found in elbow joint injuries is weakness and functional deformity. For example :- in supracondylar and intercondylar fractures main clinical feature even after repair or treatment is weakness of forearm.

## RESULT

1. Kurpara Marma is the region marked between three fully unidirectional extended fingers (i.e. index, middle and ring finger) kept from above downwards on the elbow joint and the structures present in this area comprises Kurpara Marma.
2. By critically analysing the clinical features of elbow joint injuries and the features mentioned in Kurpara Marma Aghata it is found that Kurpara Marma is a Vaikalyakar Marma.

## CONCLUSION

- After detailed cadaveric study and analysis of all ayurvedic and modern literature it can be concluded that the region within three fully unidirectional extended fingers i.e. index, middle and ring finger kept from above downwards on the elbow joint that these three well close to each other comprises Kurpara Marma.
- All the structures observed under this area during cadaveric dissection can be considered as the components of Kurpara Marma.

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