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EXPLORING THE ANATOMICAL ASPECTS OF *KURPARA MARMA* THROUGH ITS CADAVERIC DISSECTION

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ABSTRACT

The science of *Marma* is one of the special facets which is intensely elaborated in Ayurveda. There are total of 107 *Marma* are present in the human body. *Acharya Sushruta* classified *Marma* into five types i.e., *Mamsa, Sira, Snayu, Asthi* and *Sandhi*. *Kurpara Marma* is one among the 20 *Sandhi Marma* as mentioned by *Acharya Sushruta*. Although the gross regional and the *Viddha Lakshanas* are available in *Samhitas*, but detail description of particular structures present in *Kurpara Marma* region are lacking in ancient texts. The main objective of this article is to make the comprehensive and conceptual study on *Kurpara Marma* as mentioned in texts, in the view of regional and applied anatomy described in the contemporary science, and to study *Kurpara Marma* with modern regional and applied anatomy by cadaveric dissection. So, in this paper we have put our utmost efforts to elaborate the anatomical location, structure, traumatic symptoms of *Kurpara Marma* with the help of both *Ayurveda* and *Modern Literature*.

KEYWORDS: *Marma, Jiva, Kurpara, Sandhi, Vaikalyakar Marma,* Cadaveric dissection.

INTRODUCTION

Ayurveda is one of the most reliable, noble and complete ancient medical science which have proved for more than 5000 years. Even though the Modern science is changing from time to time but *AYURVEDA* has maintained its special place till date. *Rachana Sharir* is one of

those essential elements in *Ayurveda* which emphasizes on the anatomical and physiological aspects of human body. *Marma Sharir* is one such topic in *Rachana Sharir* which comprises the study of vital points of the body i.e., points or sites at body which are more vulnerable to trauma and causing permanent structural and functional deformities in body. *Marma Vigyana* was developed as a science of war. There are so many references from *Vedas* regarding attack on *Marma-sthanas* of enemies and protecting one's *Marmas* by wearing metallic protectants. These are the places where *Prana*- the force of life is said to be situated.[1] *Acharya Sushruta* in his *Pratyeka Marma Nirdesh Sharir Adhyaya*.[2] *Acharya Charak* in his *Trimarmiya Siddhi Adhyaya*[3] and *Trimarmiya Chikitsa Adhyhaya*.[4] *Vagbhatt* in his *Marma-Vibhagiya Adhyaya*.[5] have made classical description throwing light on every aspect of *Marma*. *Marma* is constituted by the confluence of *Mamsa* (muscles), *Sira* (vessels), *Snayu* (ligaments), *Asthi* (bones) and *Sandhi* (joints). *Acharya Sushrut* has explained 107 *Marmas*.[6] *Acharya Dalhana* explained the importance of *Marmas* as "*Maryanti-iti-marmani*" that means any trauma to these points may lead to death or may result in disability.[7] According to *Acharya Vaghbhat*, those sites which are painful on application of pressure and which shows *Vishama Spandana* (abnormal pulsation) are known as *Marmas* and are said as a seat of "*Jiva*".[8]

MATERIALS AND METHODS

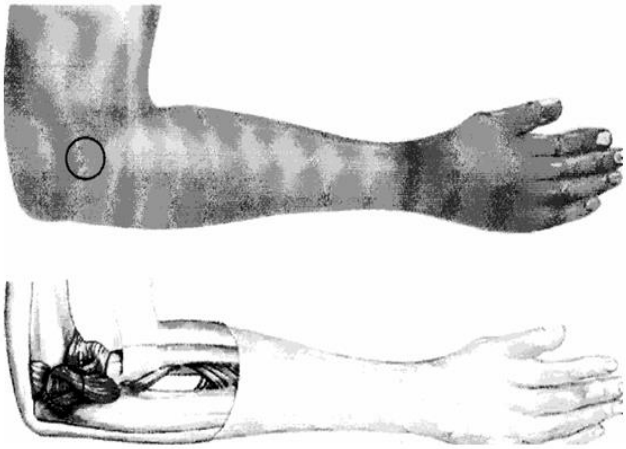
1. Literature regarding *Marma* from *Sushruta Samhita*, *Charak Samhita*, *Ashtang Hriday* and *Dalhana Teeka* and *Ghanekar Teeka***.**
2. Modern literature from B.D.C. Human Anatomy, Gray's Anatomy, Snell's Clinical Anatomy, Cunningham's Manual of Practical Anatomy.
3. Review articles, journals etc.

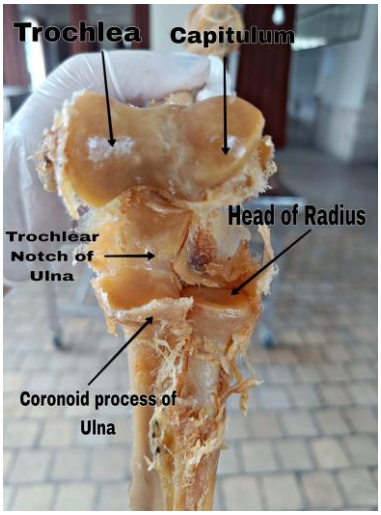
LITERARY REVIEW

According to Monier Williams Sanskrit- English dictionary, the word "*Kurpara"* means "Elbow".[9] *Kurpara Marma* is one of the delicate and vital point of the body located in *Urdhva-Shakha* (upper extremities).[10] It is exactly located at the junction of *Bahu* (arm) and *Prabahu* (forearm).[11] Structurally it is a type of *Sandhi Marma*. *Sandhi* is defined as *Yog* or *Sanyog*. So *Kurpara Marma* is related to bony joints in elbow i.e., Elbow joints. On the basis of prognosis, it is a type of *Vaikalyakar Marma*, having predominance of *Saumya Guna*.[12] Due to their *Saumya Guna*, they adhere prana within the body.[13] The *Pramana* of *Kurpara Marma* is 3 *Anguli*.[14] The *Pramana* of this *Marma* can be considered both in depth and

width of that area.[14] According to *Acharya Sushruta*, trauma to this *Marma* leads to "*Kunita"* (loss of function of forearm).[15]

Sr. No.	NAME	***KURPARA MARMA***
1.	Number	2 *Marma* points (one on each arm)
2.	Type	*Sandhi*
3.	Size	*3 Anguli*
4.	Site	The elbow joint as a whole, a large *Marma*. The main point is at the outside (trochlear notch, lateral elbow superficial to radial collateral ligament). However, the corresponding point on the inside and the point immediately behind the elbow joint are also important points.[16]
5.	Anatomical Structures involved	Elbow joint, ligament capsule, ulnar, radial and annular radial collateral ligaments, median nerve and branches. Brachial artery, tributaries of cephalic and median cubital vein. Supinator, extensor carpi radialis, biceps, triceps and pronator teres muscles.[17]
6.	Prognosis of Injury	*Vaikalyakara* (Disability-Causing) type of *Marma*. Watery in degree of vulnerability.
7.	Symptoms if Injury Occurs	Injury will damage the function of the forearm.





Description of location and traumatic 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 the Radius and Ulna.[18]

Articulation: This occurs between the trochlea and capitulum of the humerus and the trochlear notch of the ulna and the head of the radius. The articular surfaces are covered with hyaline cartilage.

■ Type: Synovial hinge joint

■ Capsule: Anteriorly, it is attached above to the humerus along the upper margins of the coronoid and radial fossae and to the front of the medial and lateral epicondyles and below to the margin of the coronoid process of the ulna and to the anular ligament, which surrounds the head of the radius. Posteriorly, it is attached above to the margins of the olecranon fossa of the humerus and below to the upper margin and sides of the olecranon process of the ulna and to the anular ligament.

■ Ligaments: The lateral ligament is triangular and is attached by its apex to the lateral epicondyle of the humerus and by its base to the upper margin of the anular ligament. The medial ligament is also triangular and consists principally of three strong bands: the anterior band, which passes from the medial epicondyle of the humerus to the medial margin of the coronoid process; the posterior band, which passes from the medial epicondyle of the humerus to the medial side of the olecranon; and the transverse band, which passes between the ulnar attachments of the two preceding bands.

■ Synovial membrane: This lines the capsule and covers fatty pads in the floors of the coronoid, radial, and olecranon fossae; it is continuous below with the synovial membrane of the proximal radioulnar joint.

■ Nerve supply: Branches from the median, ulnar, musculocutaneous, and radial nerves.

Movements

The elbow joint is capable of flexion and extension.

Flexion is limited by the anterior surfaces of the forearm and arm coming into contact. Extension is checked by the tension of the anterior ligament and the brachialis muscle. Flexion is performed by the brachialis, biceps brachii, brachioradialis, and pronator teres muscles.

Extension is performed by the triceps and anconeus muscles.

Important Relations

■ Anteriorly: The brachialis, the tendon of the biceps, the median nerve, and the brachial artery.

■ Posteriorly: The triceps muscle, a small bursa intervening.

■ Medially: The ulnar nerve passes behind the medial epicondyle and crosses the medial ligament of the joint.

■ Laterally: The common extensor tendon and the supinator.

The elbow joint is stable because of the wrench-shaped articular surface of the olecranon and the pulley-shaped trochlea of the humerus; it also has strong medial and lateral ligaments. When examining the elbow joint, the physician must remember the normal relations of the bony points. In extension, the medial and lateral epicondyles and the top of the olecranon process are in a straight line; in flexion, the bony points form the boundaries of an equilateral triangle.

Clinical Anatomy of Elbow Joint

- Distension of the elbow joint by an effusion occurs posteriorly because here the capsule is weak and the covering deep fascia is thin. Aspiration is done posteriorly on any side of the olecranon.
- Dislocation of the elbow is usually posterior, and is often associated with fracture of the coronoid process. The triangular relationship between the olecranon and the two humeral epicondyles is lost.
- Subluxation of the head of the radius (pulled elbow) occurs in children when the forearm is suddenly pulled in pronation. The head of the radius slips out from the annular ligament.
- Tennis elbow- Abrupt pronation may lead to pain and tenderness over the lateral epicondyle. This is possibly due to: Sprain of radial collateral ligament, and tearing of fibres of the extensor carpi radialis brevis.
- Miner's (or student's elbow) is characterized by effusion into the bursa over the subcutaneous posterior surface of the olecranon process.
- Optimum pulsation of the elbow- If only elbow is to be fixed it is flexed at right angle. If both elbows need fixation, the right elbow is fixed in a position of flexion at an angle slightly less than 90 degrees, and the left elbow at an angle slightly more than 90 degrees.

In this position, the right hand can be brought to the mouth and the left hand can be used for cutting up food. It can also reach the trouser pocket.[19]

DISCUSSION

After anatomically exploring the area considered as area of *Kurpara Marma* in our classics, we found that elbow joint with humero-radial, humero-ulnar and proximal radio-ulnar can be considered as the exact location of *Kurpara Marma*. An injury to the structures associated with *Kurpara Sandhi Marma* leads to paralysis, dangling of hand, wrist drop, restricted flexion and extension movement, pronation and supination movement. *Kurpara Marma* is *Vaikalyakar Marma* as some deformities still remains at injured site inspite of taking good care. The prognosis of the disease in this area is bad. The area between the medial and lateral epicondyles of humerus is roughly 3 *Angula* and is enriched with arteries, veins, nerves and muscles so, it fulfills the anthropometric measurement criteria of *Kurpar marma*. The important structure present in this region is *Sandhi* (joint) and other structures are surrounding and supplying to the joint. So, we can say that *Kurpara Marma* is *Sandhi Marma*. The weakness in forearm muscles occur when the brachial artery and peripheral nerves fails to supply in elbow joint injuries and as a result the *"Kunitwa"* – sign mentioned by *Acharya Sushruta* is justified. Moreover, in dislocation of elbow joint, injury to ulnar nerve may occur resulting in weakness of flexion and adduction of wrist which can be corelated to condition *Kunitwa*.

CONCLUSION

Therefore, *Kurpara Marma* is anatomically explored to be the *Marma* of *Urdhwashakha* and it's a *Sandhi Marma* being a joint between humero-radial, humero-ulnar and proximal radio ulnar bones. It becomes a vulnerable area due to the presence of radial and ulnar collateral ligaments, radial nerve, ulnar nerve and median nerve, various muscles etc. It is considered prognostically as *Vaikalyakara Marma* due to similarity in grave features. Thus, this site should be protected from any traumatic injury which would further protect one from grievous after effects. The utmost care should be taken in normal healthy individuals especially sports person to avoid any trauma to site of *Kurpara Marma* as its traumatic results are very grievous. Thus, the juncture point of humero-ulnar, humero-radial and proximal radio-ulnar along with radial nerve, ulnar nerve and median nerve is considered as the *Kurpara Marma*.

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