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INTEGRATIVE ANATOMICAL STUDY OF KURPARA SANDHI MARMA WITH REFERANCE TO SPORTS RELATED ELBOW INJURIES

[1]*Dr. Geetha Kumar, M.D. (Ayu) Ph.D., [2]Dr. Bhavya Rathava, M.D. (Ayu) (PhD Scholar)

[1]Professor and H.O.D Department of Rachanasharira Dr. Vasant Parikh Ayurvedic medical Collage Vadnagar, Gujarat.
[2]Assistant Professor Department of Rachanasharira Dr. Vasant Parikh Ayurvedic medical Collage Vadnagar, Gujarat.

***Corresponding Author: Dr. Geetha Kumar, M.D. (Ayu) Ph.D.**

Professor and H.O.D department of Rachanasharira Dr. Vasant Parikh Ayurved Collage Vadnagar, Gujarat.

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ABSTRACT

According to *Acharya Sushruta*, there are eleven *Vaikalyakara Marmas*, including *Kurpara Sandhi Marma*, were trauma results in functional incapacity or permanent deformity. Its dimensions are three *Angula* and it is located in the upper limb at the point where the ulna, radius, and humerus converge. This area corresponds to the elbow joint in modern anatomy, which is extremely susceptible to sports-related injuries because of trauma and repetitive mechanical stress. **Objective:** To conduct an integrative anatomical study of *Kurpara Sandhi Marma* and establish its correlation with elbow joint anatomy and sports-related injuries. **Materials and methods:** A thorough analysis of contemporary texts on anatomy and sports medicine as well as traditional *Ayurvedic* literature was used to conduct the study. *Kurpara Marma*'s structural and functional elements were examined and connected to elbow joint anatomy and typical sports injuries. **Results:** *Kurpara Sandhi Marma* corresponds with the elbow joint complex including humeroulnar and humeroradial articulations. The joint functions primarily as a hinge joint allowing flexion and extension movements. Trauma to this region may result in ligament injury, tendon damage, joint instability, and deformity, which correlates with the concept of *Vaikalyata* described in *Ayurveda*. **Conclusion:** *Kurpara Sandhi Marma* is anatomically and functionally comparable with the elbow joint. Integrative anatomical knowledge of *Kurpara Marma* may contribute to improved preventive and therapeutic strategies for sports-related elbow injuries.

KEYWORDS: *Kurpara Marma*, Elbow Joint, *Vaikalyakara Marma*, Integrative Anatomy, Sports Injuries.

INTRODUCTION

Marma are vital anatomical sites described in Ayurveda where trauma produces serious structural and functional disturbances. *Acharya Sushruta* defined Marma as ***"Mārayati iti Marma,"*** indicating that injury to these structures may lead to death or disability. A total of **107 *Marma*** is described in the human body and are classified according to anatomical structures (*Mamsa, Sira, Snayu, Asthi*, and *Sandhi*) and prognosis (*Sadyopranahara, Kalantarapranahara, Vaikalyakara, Vishalyaghna*, and *Rujakara*).

AIM

To conduct an integrative anatomical analysis of Kurpara Sandhi Marma by correlating its classical Ayurvedic description with modern anatomical structures of the elbow joint, and to evaluate its clinical significance in the context of sports-related elbow injuries.

Kurpara Sandhi Marma is a *Vaikalyakara Marma* situated at the junction of the arm and forearm with a dimension of three *Angula*. Injury to this marma results in *Vikalata* (functional disability). Based on classical descriptions, Kurpara Marma can be anatomically correlated with the **elbow joint**, a synovial hinge joint formed between the distal humerus and proximal radius and ulna.

The elbow joint is a functionally important region containing ligaments, muscles, vessels, and nerves essential for upper limb movements. It is frequently affected by trauma and repetitive stress, particularly in sports activities, leading to deformity and loss of

function comparable to the *Ayurvedic* concept of *Vikalata*.

Therefore, an integrative anatomical study of *Kurpara Sandhi Marma* is necessary to correlate classical Ayurvedic descriptions with modern elbow joint anatomy and sports-related elbow injuries.

MATERIAL AND METHODOLOGY

Materials

A. Ayurvedic Materials

Classical texts book like *Sushruta Samhita* (Sharir Sthana – Marma Sharir) *Ashtanga Hridaya*, charaka samhita.

B. Modern Materials

Anatomical Materials is from Standard textbooks like B.D. Chaurasia – anatomy, Vishram Singh – Anatomy.

METHODOLOGY

The current study is a descriptive, integrative investigation that combines contemporary anatomical analysis with Ayurvedic literature. Kurpara Sandhi Marma from classical books like Sushruta Samhita, Ashtanga Hridaya, and Charaka Samhita will be thoroughly reviewed, with an emphasis on its location, structure, dimensions, and effects of injury. In order to comprehend the structural and functional characteristics of the elbow joint, contemporary anatomical literature will be examined concurrently. In order to identify structures that correspond to Kurpara Sandhi Marma, anatomical linkage will be established through surface anatomical examination and cadaveric dissection, when available. In order to establish an integrated association between classical descriptions and contemporary elbow joint anatomical traits, the results will be methodically evaluated.

DISCUSSION

Sandh*i* "*Sandhi*" refers to the merging of two or more constructions. A point of contact between bones, joints, and bones is called an articulation or joint. In *Ayurvedic* nomenclature, all of these asthi articulations are referred to as *sandhi*. *Sandhi* is in charge of both movement and force transmission. According to *Acharya Susrutha*, a *sandhia* is a location where two constructions of comparable types meet, such as *asthisandhi, sirasandhi, or peshisandhi*.

Kurpara sandhi: The *sandhi* which are present in the *Shaka* (extremities) are *Chestavantha* (moveable). The *Kurpara sandhi* is a kind of *Kora sandhi* (Hinge) located in the upper extremities. The movement of *sandhi* is facilitated by an axis lubricated with *sleshma*. *Sleshma* enables the articulation of joint surfaces and mitigates friction between osseous structures.

Kurpara marma: *prakoṣṭaprakaṇḍayoḥ sandhāne kūrpara nāma, tatra kuṇiḥ*[1] kurpara *marma* situated in the upper limb, it is 2 in nose, structurally it is of *sandhi marma*, prognostically it is of *vaikalya kara marma*, it is present in-between *prakoshta*, (humerus) *prakanda* (radius, and ulna) asthi. Measurement of the *marma* is *3 Angula.*, injury to *this marma* leads to dangling of hand (hanging or swinging loosely), deformity of upper limb. Stiffness or restricted movement of upper limb.

Vaikalya kara marma - There are 44 *vaikalya kara mara* present in body, which produce *vaiklaytwam* (disability). *Kurpara marma* is one of the *vaikalyakara marma* present in the both upper extremities. *Marma* which are producing disability due to presence of *soma* (water) *mahabhuta*, soma (water) due to firmness and coldness sustain life.[2] If *vaikalya kara marma* is getting injured, the part of body becomes disabled, but if treated by efficient physician it becomes active.[3]

The patient may survive minor trauma or injury, but such damage can result in permanent disability, leading to a restricted or dependent lifestyle. Based on the anatomical location and the consequences of injury described, ***Kurpara Marma*** can be correlated with the **elbow joint**.

In its broadest sense, the term **sports injury** refers to injuries that commonly occur during athletic activities or exercise. The elbow joint is particularly susceptible to damage due to the considerable stress placed upon it during sports. The injuries of ***Kurpara Sandhi Marma*** described in Ayurvedic classics can be correlated with sports-related injuries of the elbow joint. Athletes are especially prone to such injuries and therefore require adequate knowledge of joint anatomy and function. At the same time medical science is also in a position to give proper advises in both preventive & curative aspect through better anatomical understanding by understanding elbow joint injuries through a broader perspective of *marmabhighatha Lakshanas* it provides a wide range of diagnostic &curative scope to *Ayurvedic* practitioners.

Anatomy of elbow[4]
Elbow joint

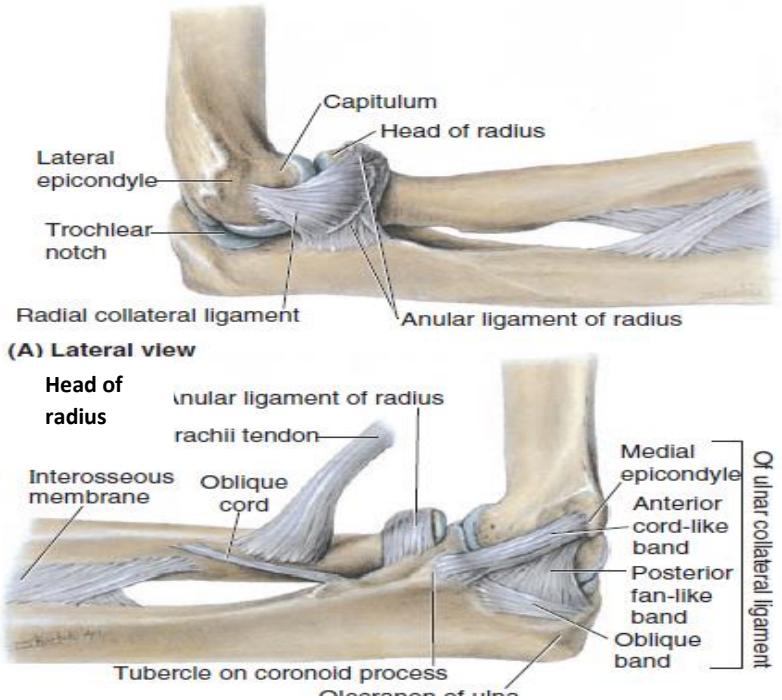

Fig. 1: Elbow joint lateral view and medial view.

The elbow joint is a hinge-type synovial joint that connects the upper end of the radius and ulna to the lower end of the humerus. The trochlear notch of the ulna articulates with the trochlea of the humerus, while the upper surface of the radius articulates with the capitulum of the humerus. The superior radioulnar joint and the elbow joint are one and the same. Cubital articulators are the collective term for the humero radial, humero ulnar, and superior radioulnar joints.

In full flexion the fossae present immediately above the capitulum and trochleae receive the head of radius and coronoid process of the ulna, and in full extension, a deep fossa which present posterior receives the olecranon. The transverse axis of elbow joint is directed medially downward so in extended forearm it makes carrying angle.[5]

The superior surface of the cylindrical head of the radius is shallowly concave, allowing articulation with the capitulum of the humerus. The proximal end of the ulna presents a deep trochlear notch, formed by the olecranon and coronoid processes. A curved ridge connecting these two prominences corresponds with the groove of the humeral trochlea. The oblique alignment of the ulnar shaft relative to this ridge contributes significantly to the carrying angle of the elbow. The trochlear notch typically consists of two distinct articular surfaces, located on the olecranon and the coronoid process.

Ligaments of elbow joint

- **Capsular ligament:** The fibrous capsule of the elbow joint is attached superiorly to the distal end of the humerus, including the margins of the capitulum and trochlea, and along the borders of the radial and coronoid fossae, which lie within the capsular cavity. Inferomedial, the capsule is attached to the margins of the trochlear notch of the ulna except on its lateral aspect, while inferolateral it blends with the structures of the proximal radioulnar joint. The inner surface of the capsule is lined by a synovial membrane, which also extends into the fossae and recesses of the joint cavity**.**
- **The anterior ligament** and **posterior ligament** are the thickening of the capsule.
- **The ulnar collateral ligament** is tri–Angula in shape. Its apex attached to the medial epicondyle of the humerus. and the base is to the ulna. The ligament has thick anterior posterior bands they are attached below to the coronoid process and olecranon process respectively. The lower ends joined by the thinner intermediate fibers of the ligament.
- **The radial collateral or lateral ligament**: It is a fan shaped ligament extending from the lateral epicondyle to the annular ligament.[6]

Blood supply: Anastomosis around elbow joint links the brachial artery with the upper end of radial and ulnar artery.

Nerve supply: Radial, median, and ulnar nerves.

Movement: flexion is brought by brachialis, biceps, brachioradialis.

Extension: by triceps and anconeus.

The elbow joint is the commonly injured joint in childhood. The joint may be affected by an extra-articular or intra-articular issue. TB arthritis, rheumatoid arthritis are some of the common intra articular problems. While tennis elbow, golfers' elbow, students' elbow are the extra articular problems of elbow. Supra condylar fracture, dislocation of elbow, head of radius fracture are some of the common elbow injuries.

Ulnar Collateral Ligament injuries: can manifest as acute ligament tears following a single valgus stress or as overuse sprains following repetitive valgus overloads. The clinical presentation is similar to LLE; however, the typical age range of the athlete is the older teenager who is skeletally mature. Suspected UCL injuries should be referred for further evaluation by a sports medicine specialist. Athletes with UCL injuries should not be allowed to pitch till they have been evaluated. Although uncommon in children, **neurological injuries** such as C8-T1 radiculopathy and **ulnar neuritis** can manifest as medial elbow pain and should be included in the differential diagnosis.

The most common injuries caused by lateral compression of the elbow are to the radial head and capitellum.

Osteochondrosis of the capitellum[7]
Panner disease, or osteochondrosis of the capitellum: It usually affects kids between the ages of 7 and 12 and presents as dull, achy lateral elbow pain brought on by exercise. Reduced range of motion, swelling, and clicking are rare side effects. Panner disease tends to be a benign self-limited condition that does well over time and is treated with complete rest from inciting activities such as throwing and weightbearing on the elbow. Osteochondral injuries can also be observed in the radial head.

Teenagers between the ages of 13 and 17 have osteochondritis dissecans (OCD) of the capitellum. This is a localized injury to subchondral bone that results from repetitive lateral compression of the elbow during overhead motions. These patients report a general dull elbow pain that worsens with activity, often have a flexion contracture of 15° or greater, and may have mechanical symptoms of clicking or popping. Loose body formation, residual capitellum deformity, and elbow degenerative joint disease are potential sequelae.

Different treatment options are used based on the age and skeletal maturity of the patient and the type of lesion present.

- OCD lesions can be separated into type I, which has no displacement and no articular cartilage fracture;
- type II, which has evidence of articular cartilage fracture or partial displacement; type III, which is completely displaced with loose bodies in the joint.
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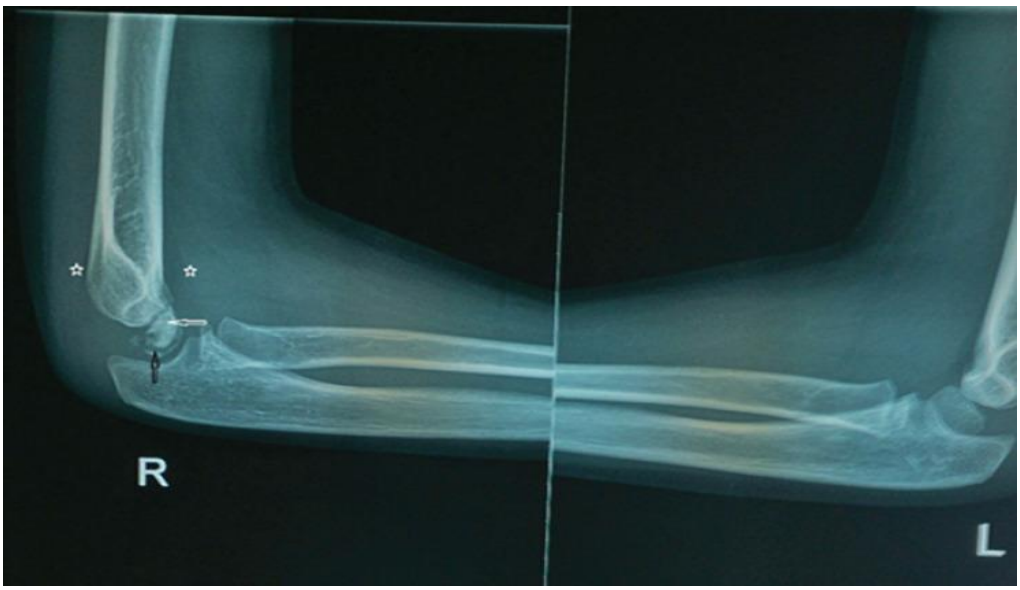

[Fig. 2: Plain radiographs of both elbows lateral view showing joint effusion (white star), irregular articular outline with radiolucent line in subchondral bone (black arrow), and faint sclerosis of capitellum (white arrow).][8]

Medial Epicondylitis (Golfer's Elbow)[9]: Golfer's elbow is a frequent term for medial epicondylitis. This does not imply that this condition is exclusive to golfers. However, medial epicondylitis is frequently brought on by the golf swing. Golfer's elbow can also result from a variety of other repetitive tasks, such as throwing, using various hand tools, cutting wood with and operating a chain saw. Golfer's elbow symptoms can be brought on by any activity that strains the same forearm muscles.

Golfers elbow: Medial epicondylitis (Golfer's elbow) is a tendinopathic condition involving the tendinous insertion of the wrist and finger flexor muscles along with the forearm pronators. It is comparable to lateral epicondylitis but affects the medial aspect of the elbow, particularly at the origin of the pronator teres and the common flexor tendon. Pain is typically elicited by resisted flexion of the wrist and fingers when the forearm is in pronation. The condition primarily involves degenerative changes of the common flexor tendon, characterized by repetitive microtrauma resulting in Angio fibroblastic degeneration or tendinosis. The principles of management are similar to those used in the treatment of lateral epicondylitis.

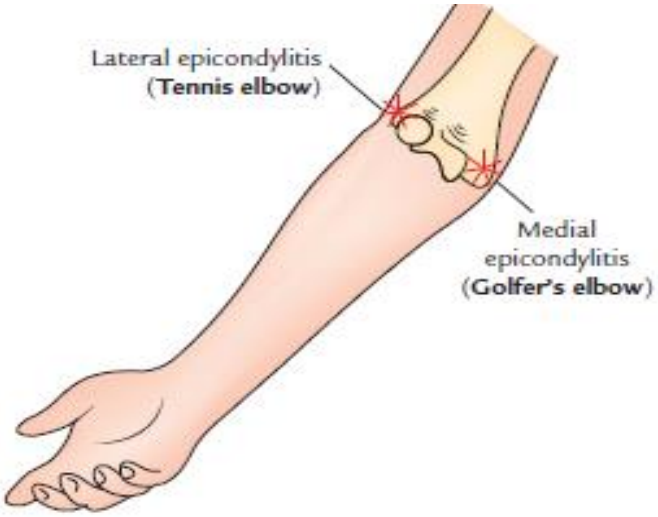

Fig. 3: Lateral and medial epicondylitis.[10]

Lateral epicondylitis /Tennis elbow[11]: is caused by partial tearing or degeneration of the origin of the superficial extensor muscles from the lateral epicondyle of the humerus.

It is characterized by pain and tenderness of the lateral epicondyle of the humerus, with pain radiating down the lateral side of the forearm, it is common in tennis players violinists, and housewives.

Medial Elbow Pain

Causes in Throwers

- Avulsion fractures of the medial epicondyle
- Ulnar Collateral Ligament (UCL) sprains or tears
  - Little league elbow (LLE) is a valgus overload or overstress injury to the medial elbow during the throwing motion; valgus stress is placed on the elbow. This valgus stress results in tension on the medial structures (i.e., medial epicondyle, medial epicondylar apophysis, medial collateral ligament complex) and compression of the lateral structures (i.e., radial head, capitellum).
  - Repeated stress results in overuse injury when tissue breakdown exceeds tissue repair.
  - Recurrent microtrauma of the elbow joint can lead to LLE, a syndrome that encompasses
    - Delayed or accelerated growth of the medial epicondyle (medial epicondylar apophysitis),
    - Traction apophysitis (medial epicondylar fragmentation),
    - Medial epicondylitis.

Treatment of elbow injuries[12]

It consists of rest, holding cold compress, non-steroidal anti-inflammatory drugs, local anesthetic, and steroid injection, and physiotherapy. Tennis player exercises, light pocket, smaller grip, elbow support. Chronic cases require surgery.

In Ayurvedic prospective injury increases *vata*, so, the treatment should consist of *vatha hara*, drugs in the treatment. They are lepam with *vata hara sothahara and raktaprasadak dravyas*, *pichu* with *vatha hara thilams*, *and Dhara* with *vatha hara tailas.*[13]

General preventive measures of elbow

1. Don't carry objects that are two heavies
2. Stretch before and after physical exercise.
3. Do stretching and range-of-motion exercise with finger and wrist to prevent stiffening of the tendon of the elbow.
4. Gently bend, straighten, and rotate your wrist., if pain is there then stopping the exercise.
5. To prevent strain of muscles, use the correct movement or positions during activities.
6. Avoid over use of arm, doing repeated movement, which will cause injury to the bursa.
7. Wear seat belt while travelling in a motor vehicle.
8. Wear protective gear during sports or recreation such as roller-skating or soccer.
9. Supportive splints reduce the risk of injury.
10. Wear protective clothing to protect sports injury.

CONCLUSION

The elbow joint complex in contemporary anatomy exhibits a strong anatomical and functional relationship

with *Kurpara Sandhi Marma*, which is referred to as a *Vaikalyakara Marma* in *Ayurvedic* classics. The humerus, radius, and ulna articulate to form the elbow, a compound hinge (Para condylar) joint that is protected by a shared capsule and strengthened by robust collateral and annular ligaments. Efficient flexion-extension movements are made possible by the stability offered by the trochlea of the humerus and the trochlear notch of the ulna. However, because of this structural complexity, the joint is extremely susceptible to damage and recurrent mechanical stress, especially during sporting activities.

Pain, inflammation, instability, and mobility restriction are all possible outcomes of injuries to this area. In extreme situations, these injuries may result in permanent deformity or functional handicap. This clinical presentation justifies its classification as a *Vaikalyakara Marma* since it closely mimics the characteristics of *Kurpara Marma Abhighata* as described in *Ayurveda*, including elbow deformity, arm swinging or dangling, stiffness, and painfully restricted upper limb motions.

Thus, *Kurpara Sandhi Marma* can be anatomically correlated with the elbow joint, and the concept of *Marma Abhighataja* provides a meaningful framework for understanding sports-related elbow injuries. Integrative anatomical knowledge of *Kurpara Marma* and elbow joint structures may help in early diagnosis, prevention of injuries, and development of effective therapeutic and rehabilitative measures. Proper protection, strengthening, and controlled use of the forearm and arm are essential to maintain normal elbow function and to prevent *Vaikalyata* (permanent disability).

REFERENCES

1. Priyavata Sharma, *Susrutha samhitha*, *sharirasthana* 6/24 published by Choukhambha visvabharati oriental publishers &distributors. Varanasi. Reprint, 2005.
2. Prof. D.G Thatte, *Susrutha samhitha shareerasthana* 6/12-13 published by Choukambha publishers, second edition, 2005.
3. Prof. D.G Thatte, *Susrutha samhitha shareerasthana* 6/12-13 published by Choukambha publishers, second edition, 2005.
4. Keith L Moore, Arthur E Dalley, Anne M.R. Agur clinically oriented anatomy sixth edition, Lippincott Williams & Wilkins, a Wolters Kluwer business, 2010; 803.
5. B.D Chaurasia, Human anatomy. CBS publishers, 4th edition, 149.
6. R.M.H. MCMiNN, last's anatomy regional and applied published by Churchill Livingstone Medical Division of Pearson professional Limited, International student Edition of ninth edition Reprinted, 1997; 83.
7. Richard S. Snell, clinical Anatomy published by Lippincott Williams & Wilikins 7th edition chapter 9, 551.
8. Osteochondrosis of Humeral Capitellum, Diagnosis and Treatment – A Case Report Journal of Orthopaedic Case Reports, July 2021; 11(7): 74-77, DOI:10.13107/jocr. 2021.v11. i07.2324
9. B.D Chaurasia, Human anatomy. CBS publishers, 4th edition, 195.
10. Vishram Singh Text book of anatomy, upper limb and thorax volume 1 second edition 2010 ISBN:978-81-312-3729-8 reed Elsevier India private limited, 131.
11. Richard S Snell, Clinical Anatomy published by Lippincott Williams & Wilikins 7th edition chapter, Chapter 9, 533.
12. John Ebnezar- Text book of Arthopaedics, published by Jaypee brothers, medical publishers New Delhi Reprinted, 2003; 184.
13. Priyavata Sharma, *Susrutha samhitha*, *chikitsa sthana* 2nd Chapter published by Choukhambha visvabharati oriental publishers &distributors. Varanasi. Reprint, 2005.